JOINT EXTERNAL EVALUATION OF IHR CORE CAPACITIES

of

AUSTRALIA

Mission report

24 November -1 December 2017

World Health Organization

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Acronyms and Abbreviations

AAHL	Australian Animal Health Laboratory
AAR	After-action review
ACSQH	Australia Commission on Safety and Quality in Health Care
AFP	Australian Federal Police
AGAR	Australian Group on Antimicrobial Resistance
AGCC	Australian Government Crisis Committee
AGCMF	Australian Government Crisis Management Framework
Agvet	Agriculture and veterinary chemicals
AHMPPI	Australian Health Management Plan for Pandemic Influenza
AHPPC	Australian Health Protection Principal Committee
AICS	Australian Inventory of Chemical Substances
AIIMS	Australasian Inter-Service Incident Management System
AMR	Antimicrobial resistance
AMRPC	AMR Prevention and Containment
AMS	Antimicrobial stewardship
AMU	Antimicrobial use
ANSTO	Australian Nuclear Science and Technology Organisation
APSED	Asia Pacific Strategy for Emerging Diseases
APVMA	Australian Pesticides and Veterinary Medicines Authority
ARM	Australian Response MAE
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
AST	Antimicrobial susceptibility testing
ASTAG	Australian Strategic and Technical Advisory Group
AURA	Antimicrobial Use and Resistance in Australia
AUSMAT	Australian Medical Assistance Team
BL	Biosafety level
BFSN	Binational Food Safety Network
CARs	Critical Antimicrobial Resistances
CBRN	Chemical, Biological, Radiological and Nuclear
CCEAD	Consultative Committee on Emergency Animal Diseases
CDPLAN	Emergency Response Plan for Communicable Disease Incidents of National Significance
CDNA	Communicable Diseases Network Australia
CMO	Chief Medical Officer
CPE	Carbapenemase-Producing *Enterobacteriaceae*
CVO	Chief Veterinary Officer
DAWR	Australian Government Department of Agriculture and Water Resources
Defence	Australian Government Department of Defence

DIBP	Department of Immigration and Border Protection (subsequently known as Home Affairs)
DoH	Australian Government Department of Health
EBS	Event-based surveillance
enHealth	Environmental Health Standing Committee
EQA	External quality assurance
EMT	Emergency Medical Team
FAO	Food and Agriculture Organization of the United Nations
FETP	Field Epidemiology Training Program
FPoE	First Point of Entry
FSANZ	Food Standards Australia New Zealand
GMO	Genetically modified organisms
HCAI	Healthcare-associated infection
Health CBRN Plan	Domestic Health Response Plan for Chemical, Biological, Radiological or Nuclear Incidents of National Consequence
IHR	International Health Regulations
IHR NFP	National IHR Focal Point
ILI	Influenza-like illness
INFOSAN	International Food Safety Authorities Network
IPC	Infection prevention and control
ISO	International Organization for Standardization
JEE	Joint External Evaluation
LHD	Listed human disease
MAE	Masters of Philosophy in Applied Epidemiology
MBS	Medicare Benefits Schedule
MoU	Memorandum of Understanding
NATA	National Association of Testing Authorities, Australia
NatHealth	National Health Emergency Response Arrangements
National CDPLAN	Emergency Response Plan for Communicable Disease Incidents of National Significance: National Arrangements
NCAS	National Centre for Antimicrobial Stewardship
NCC	National Crisis Committee
NCCTRC	National Critical Care and Trauma Response Centre
NFIRP	National Food Incident Response Protocol
NHEMRN	National Health Emergency Media Response Network
NHEMS	National Health Emergency Management Standing Committee
NICNAS	National Industrial Chemicals Notification and Assessment Scheme
NIP	National Immunisation Program

NIR	National Incident Room
NMS	National Medical Stockpile
NNDL	National Notifiable Disease List
NNDSS	National Notifiable Diseases Surveillance System
NPAAC	National Pathology Accreditation Advisory Council
NPW	Nuclear Powered Warship
NSQHS	National Safety and Quality Health Service
OHP	Office of Health Protection
OIE	World Organisation for Animal Health
PC	Physical Containment
PCR	Polymerase Chain Reaction
PHEIC	Public health emergency of international concern
PHLN	Public Health Laboratory Network
PoCT	Point of Care Testing
PoE	Points of entry
RPS	Radiation Protection Series
SES	State Emergency Service
SoNG	Series of National Guidelines
SOP	Standard operating procedure
SSBA	Security Sensitive Biological Agent
TGA	Therapeutic Goods Administration
WAHIS	World Animal Health Information System
WHO	World Health Organization
WHOCC	WHO Collaborating Centre
WPRO	WHO Regional Office for the Western Pacific

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Executive summary

Introduction

Health security threats from infectious diseases and public health emergencies are inevitable and all countries are universally vulnerable. In recognition of this situation, WHO developed the International Health Regulations (IHR) 2005 to help the international community prevent, detect and respond to acute public health events with potential to cross borders and threaten populations worldwide. The IHR (2005) require that countries develop core capacities to manage acute public health events. In the Western Pacific Region, the Asia Pacific Strategy for Emerging Diseases (APSED) has been used as the action framework for building and strengthening core capacity under the IHR (2005). For over a decade, Australia has been supporting the implementation of APSED in the Western Pacific and South-East Asian regions. More recently, APSED has been updated to include public health emergencies (Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies [APSED III]) and has been endorsed by the Regional Committee Meeting (RCM).

The Joint External Evaluation (JEE) contributes to the monitoring and evaluation of core capacities under the IHR (2005) and is a key component under the IHR Monitoring and Evaluation Framework. It uses a standard tool to review national capacities across 19 technical areas related to health security. The JEE is a voluntary process, it is multisectoral in approach, is performed as a peer-to-peer collaboration between national and international experts to reach a consensus and is transparent in nature. The JEE process enables countries to identify priority actions to enhance their health security and to foster partnerships with stakeholders through revision and implementation of a national work plan. Once updated, the plan is expected to serve as a common framework to coordinate health security activities for all-hazards under the IHR (2005) and resource mobilization.

From 24 November to 1 December 2017, a JEE mission took place in Australia. This report is the product of a JEE of the capacity of Australia to prevent, detect and rapidly respond to public health threats of a natural, deliberate or accidental nature. Australia is the second high-income country in the Western Pacific Region and the first in the Pacific to voluntarily conduct a JEE of IHR (2005) core capacities.

Key findings from the Joint External Evaluation

Australia is a federation of six states and two territories. The country has a population of over 24 million and a life expectancy which exceeds 80 years for both men and women.

Universal access to health-care in Australia is provided through a system known as Medicare. Medicare is based on the principles of choice, access and universality, and combines free access to public hospital services and subsidised access to medical services and pharmaceuticals, with higher subsidies for those using a higher volume of services and people with low incomes. Australia's health system includes targeted assistance for particular groups, such as funding of community-controlled health services for Aboriginal and Torres Strait Islander peoples.

Responsibility for health lies across all levels of government (federal, state and territory as well as local), with different, and often shared, roles as funders, policy developers, regulators and service deliverers.

The health system operates three levels of care: preventive services, primary care and specialist and acute care. The system is a complex matrix of services, providers and structures involving the public and private sectors.

Primary health care is provided by providers working in collaboration with Primary Health Networks, a national network of 31 independent regional primary health care organisations. For hospital services, there are 701 public and 630 private hospitals in Australia.

The Australian Government Department of Health (DoH) manages responses to national health emergencies, including how the public health sector will respond and manage communicable disease outbreaks, epidemics or pandemics. The DoH, in partnership with the Australian Health Protection Principal Committee (AHPPC), maintains the National Health (NatHealth) Emergency Response Arrangements.

The NatHealth Arrangements outline mechanisms for the coordination of the Australian public health system's response to emergencies of national concern. The Office of Health Protection (OHP) at the DoH is in charge of managing the IHR (2005) National Focal Point (IHR NFP). The OHP manages the National Incident Room (NIR) and provides the national (Commonwealth level) operational coordination function of incident management and communication coordination for heath security.

Strong cooperation links and coordination mechanisms exist between the human and animal public health arms of the system in Australia. The veterinary and food safety authorities are tied in to most of the NatHealth subcommittees and networks and the AHPPC. The Chief Veterinary Officer (CVO) is Australia's Delegate to the World Organisation for Animal Health (OIE). The Office of the Chief Veterinary Officer coordinates Australia's OIE work and draws on the expertise of other Australian Government departments and agencies, industry bodies and other experts on the issues under consideration. There are also eight Focal Points on specific animal-related topics (animal welfare, veterinary products, wildlife, disease notification, communications, laboratories, food safety and aquatics). These Focal Points provide support to the OIE delegate on these specific topics and also provide linkages with their counterparts in other countries through the OIE network.

Australia has developed a comprehensive system of capabilities and functions to prepare, detect and respond to health security threats and has fully implemented the necessary legislation to implement the International Health Regulations (2005). Some of the most significant examples of Australia's capacity include:

- Points of Entry - a comprehensive system of border and quarantine measures reduces risks of importation of pathogens and pests, protecting the unique ecosystem and agriculture from invading species and disease.
- Microbiological laboratory capacity – Australia's cutting edge laboratories provide not only comprehensive services for the population, but ensure a high level of preparedness for emerging disease.
- Biorisk management – Australia has been and still is a benchmark for other countries in the management of biorisks, both of natural and intentional causes.

The country has demonstrated strong regional and global leadership in IHR (2005) implementation. This has not only occurred through leading by example in the national implementation of public health capacities but also through supporting and building capacity in other Member States. Some examples are especially noteworthy, including:

- Health personnel – the Australian Medical Assistance Team (AUSMAT) has been deployed in response to international disasters. They have also supported Emergency Medical Team (EMT) programmes outside the country. Furthermore, scholars and alumni of the Master of Philosophy in Applied Epidemiology (MAE) are well recognised for strengthening surveillance and public health emergency response capacities in the international setting.

- Laboratories – WHO and OIE Collaborating Centres and Reference Laboratories in Australia have been instrumental in supporting Member States in laboratory confirmation, additional molecular analysis and strengthening capacity of national laboratories.

Australia has committed to supporting health security through regional investments in the broader Asia Pacific region. The Australian Government's Indo-Pacific Health Security Initiative, launched on 8 October 2017, is investing 300 million Australian dollars over five years to contribute to the prevention and containment of emerging and re-emerging communicable disease outbreaks with the potential to cause social and economic harm on a national, regional or global scale. Investments under the Initiative aim to promote global and regional cooperation, catalyse international responses to countries' identified needs, apply Australia's unique strengths in health security and accelerate access to new and effective tools.

During the JEE mission, it was acknowledged that the public health system of Australia is complex, with a number of actors at different jurisdictional levels (Commonwealth, states and territories, and local government) and in different sectors. Despite this, the system of networks, committees and institutional actors functions cohesively, all with their own tasks and responsibilities. However, challenges remain with maintaining a high operational functionality in this complex system to ensure continuous essential public health functions development (prevention, promotion, protection) for the benefit of the Australian population.

Although outstanding progress has been made for IHR (2005) requirements in the country, a number of observations were identified by the JEE team that may be considered to further strengthen public health capacities.

For example:

- Development of an all-hazards health protection framework – Australia has a national framework for communicable disease control which can be built on.
- Public Health Workforce – some specific competencies were recognized for which there is a limited workforce and future replacement may be at risk.
- Genomics for infectious disease surveillance – Australia is leading the research field in the area of complete genome based laboratory techniques and the use of genome data in disease surveillance could be better harnessed.
- Joint training and exercising – conduct of trainings and exercises across Australian Government agencies and jurisdictions would be beneficial in identifying areas requiring improvement, sharing and implementation of lessons.
- Animal and human health linkages– Australia has developed and implemented steps to ensure a collaborative approach between the human and animal health sectors, although opportunities remain for the development of greater coordination of their activities.

Conclusions

The JEE team is grateful for the collaborative, collegial, open and transparent dialogue throughout the JEE process, and the strong commitment of Australia towards strengthening its IHR (2005) core capacity requirements nationally, regionally and globally.

Australia has demonstrated a very high level of capacity in this JEE. It is important to note that having sustainable capacity across many technical areas today does not guarantee future maintenance of this status, but systems need to keep evolving as knowledge, technology and society changes. However, Australia is in an excellent position to build on its strengths and continue developing its systems for health security. This will, however, require continued adoption of modern surveillance, prevention and control methods and approaches, including modern epidemic intelligence and community communication approaches, as they become available. For example, cutting edge applied research conducted in Australia on the use of microbial complete genome analysis is clearly ready to be firmly embedded into regular infectious disease surveillance. Likewise, there are many opportunities for further improvement of electronic surveillance systems of IHR-related hazards.

High capacity also means that there is an obligation to proactively support the other Member States in the region to achieve their core capacities under IHR (2005), which Australia is actively doing. The JEE team would like to commend Australia for its commitment to this, in particular through the recently launched Health Security Initiative for the Indo-Pacific Region. Moving forward, the JEE team looks forward to Australia's continued leadership on health security at the regional and global level.

Australia scores

Technical areas	Indicators	Score
National legislation, policy and financing	P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR (2005)	5
	P.1.2 The State can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with IHR (2005)	5
IHR coordination, communication and advocacy	P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR	5
Antimicrobial resistance	P.3.1 Antimicrobial resistance detection	4
	P.3.2 Surveillance of infections caused by antimicrobial-resistant pathogens	4
	P.3.3 Health care-associated infection (HCAI) prevention and control programmes	5
	P.3.4 Antimicrobial stewardship activities	4
Zoonotic diseases	P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens	5
	P.4.2 Veterinary or animal health workforce	5
	P.4.3 Mechanisms for responding to infectious and potential zoonotic diseases are established and functional	5
Food safety	P.5.1 Mechanisms for multisectoral collaboration are established to ensure rapid response to food safety emergencies and outbreaks of foodborne diseases	5
Biosafety and biosecurity	P.6.1 Whole-of-government biosafety and biosecurity system is in place for human, animal and agriculture facilities	5
	P.6.2 Biosafety and biosecurity training and practices	4
Immunization	P.7.1 Vaccine coverage (measles) as part of national programme	5
	P.7.2 National vaccine access and delivery	5
National laboratory system	D.1.1 Laboratory testing for detection of priority diseases	5
	D.1.2 Specimen referral and transport system	5
	D.1.3 Effective modern point-of-care and laboratory-based diagnostics	5
	D.1.4 Laboratory quality system	5
Real-time surveillance	D.2.1 Indicator- and event-based surveillance systems	5
	D.2.2 Interoperable, interconnected, electronic real-time reporting system	3
	D.2.3 Integration and analysis of surveillance data	5
	D.2.4 Syndromic surveillance systems	5
Reporting	D.3.1 System for efficient reporting to FAO, OIE and WHO	5
	D.3.2 Reporting network and protocols in country	4
Workforce development	D.4.1 Human resources available to implement IHR core capacity requirements	5
	D.4.2 FETP[1] or other applied epidemiology training programme in place	5
	D.4.3 Workforce strategy	4
Preparedness	R.1.1 National multi-hazard public health emergency preparedness and response plan is developed and implemented	5
	R.1.2 Priority public health risks and resources are mapped and utilized	3

[1] FETP: field epidemiology training programme

Technical areas	Indicators	Score
Emergency response operations	R.2.1 Capacity to activate emergency operations	4
	R.2.2 EOC operating procedures and plans	4
	R.2.3 Emergency operations programme	5
	R.2.4 Case management procedures implemented for IHR relevant hazards.	5
Linking public health and security authorities	R.3.1 Public health and security authorities (e.g. law enforcement, border control, customs) are linked during a suspect or confirmed biological event	4
Medical countermeasures and personnel deployment	R.4.1 System in place for sending and receiving medical countermeasures during a public health emergency	4
	R.4.2 System in place for sending and receiving health personnel during a public health emergency	5
Risk communication	R.5.1 Risk communication systems (plans, mechanisms, etc.)	5
	R.5.2 Internal and partner communication and coordination	5
	R.5.3 Public communication	4
	R.5.4 Communication engagement with affected communities	3
	R.5.5 Dynamic listening and rumour management	4
Points of entry	PoE.1 Routine capacities established at points of entry	5
	PoE.2 Effective public health response at points of entry	5
Chemical events	CE.1 Mechanisms established and functioning for detecting and responding to chemical events or emergencies	5
	CE.2 Enabling environment in place for management of chemical events	5
Radiation emergencies	RE.1 Mechanisms established and functioning for detecting and responding to radiological and nuclear emergencies	4
	RE.2 Enabling environment in place for management of radiation emergencies	4

Scores: 1=No capacity; 2=Limited capacity; 3=Developed capacity; 4=Demonstrated capacity; 5=Sustainable capacity.

PREVENT

National legislation, policy and financing

Introduction

The International Health Regulations (IHR) (2005) provide obligations and rights for States Parties. In some States Parties, implementation of the IHR (2005) may require new or modified legislation. Even if a new or revised legislation may not be specifically required, states may still choose to revise some regulations or other instruments in order to facilitate IHR implementation and maintenance in a more effective manner. Implementing legislation could serve to institutionalize and strengthen the role of IHR (2005) and operations within the State Party. It can also facilitate coordination among the different entities involved in their implementation. See detailed guidance on IHR (2005) implementation in national legislation at http://www.who.int/ihr/legal_issues/legislation/en/index.html. In addition, policies that identify national structures and responsibilities as well as the allocation of adequate financial resources are also important.

Target

Adequate legal framework for States Parties to support and enable the implementation of all their obligations, and rights to comply with and implement the IHR (2005). New or modified legislation in some States Parties for implementation of the IHR (2005). Where new or revised legislation may not be specifically required under the State Party's legal system, States may revise some legislation, regulations or other instruments in order to facilitate their implementation and maintenance in a more efficient, effective or beneficial manner. States Parties ensure provision of adequate funding for IHR implementation through the national budget or other mechanism.

Australia level of capabilities

Under the Australian Constitution, the Australian Government has responsibility for quarantine, and state and territory governments have general responsibility for public health.

Australia incorporates international obligations under the IHR (2005) into national domestic legislation through the *National Health Security Act 2007* and the *Biosecurity Act 2015*. Following adoption of the IHR in 2005, Australia assessed existing legislation to determine whether IHR requirements were met. The assessment found that Australia's existing legislation was generally consistent with the IHR (2005), but also recommended some amendments. These recommendations were incorporated into the *National Health Security Act 2007* to fulfil IHR obligations. Further, following a review of biosecurity arrangements and existing legislation in 2008, the *Biosecurity Act 2015* was developed to further implement Australia's IHR requirements, including those deemed necessary at First Points of Entry (FPoEs).

The *National Health Security Act 2007* was implemented to facilitate communicable disease surveillance and information sharing across jurisdictions to develop a picture of national trends and issues. Australia's states and territories, who have the primary responsibility for public health surveillance and response, have enacted their own public health acts and laws to help facilitate the collecting, reporting of, and responding to diseases on the National Notifiable Disease List (NNDL). The National Health Security Agreement, which is an agreement between the Australian Government and state and territory governments, supports implementation of the *National Health Security Act 2007*. The Acts and Agreement support strong relationships and coordinate action between different departments of the Australian Government (e.g.

Australian Government DoH and Australian Government Department of Agriculture and Water Resources [DAWR]) and jurisdictions to implement the IHR.

The primary responsibility for public health matters under the Australian Constitution, including surveillance and response for both human and animal health, lies with state and territory governments. In each state and territory, a public health act and other regulations are in place to support this. The *Biosecurity Act 2015* provides a legislative framework for national human biosecurity emergency arrangements. The *Biosecurity Act 2015* provides for a range of powers to manage human biosecurity emergencies, and to prevent and manage the entry of certain communicable diseases.

The DoH manages responses to national health emergencies, including how the public health sector will respond and manage communicable disease outbreaks, epidemics or pandemics. DoH, in partnership with the Australian Health Protection Principal Committee (AHPPC), maintains the National Health Emergency Response Arrangements (NatHealth Arrangements).

Through the Therapeutic Goods Administration (TGA), Australia regulates the import, supply, export, manufacture and advertising of therapeutic goods, including medicines, medical devices and biologicals to ensure their safety, quality and efficacy.

Recommendations for priority actions

- Build on the existing National Framework for Communicable Disease Control to create an all-hazards health protection framework.
- Undertake an analysis of policies related to the IHR (2005) to identify gaps and potential overlap in existing policies.
- Update legislation and policies to allow for protected information under the Biosecurity Act to be shared with the National IHR Focal Point (IHR NFP).
- Review the *National Health Security Act 2007* and the National Health Security Agreement to consider possible amendments taking into account technological advancements in communicable disease surveillance and control while ensuring consistency with the *Biosecurity Act 2015*.
- Document and publish administrative arrangements and policies from various sectors, in order to encourage cross-sectoral collaboration.
- Consider simultaneous reporting to states and territories and IHR NFP from national reference laboratories, chemical sector and radiation sector for urgent and high risk hazards.

Indicators and scores

P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR (2005) – Score 5

Strengths/best practices

- Australia has incorporated a number of the IHR core capacities into law, providing a thorough legislative basis for their implementation. The *Biosecurity Act 2015* has provisions that allow temporary measures under the IHR (2005) to be implemented, to enable response during a public health emergency of international concern (PHEIC), ensuring flexibility in maintaining compliance with the IHR (2005).
- Australia is frequently invited to present on the Security Sensitive Biological Agents (SSBA) Regulatory Scheme at national and international forums. These forums have included discussion around lessons learned from implementation, monitoring and compliance trends, and challenges for the future. The Australian scheme has been used as a model for regulatory frameworks for SSBA developed in similar countries (e.g. Canada).

- The *Financial Framework (Supplementary Powers) Regulations 1997*, provides a framework for the expenditure of public money. Part 4 of Schedule 1AA, reference 415.040, provides funding for health emergency planning and response, including IHR core capacities such as response, chemical safety and laboratories. The clear allocation of this expenditure provides a strong basis for IHR implementation activities.

Areas that need strengthening/ challenges

- The *Biosecurity Act 2015* does not specifically allow for information collected under it to be shared with NFPs. Although a workaround is in place, an amendment bill is being developed to remove this impediment.

P.1.2 The State can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with the IHR (2005) – Score 5

Strengths/best practices

- Australia has reviewed its legislation to determine whether IHR (2005) requirements have been met. Findings from the review led to amendments in existing legislation and development of additional legislation.
- Australia has incorporated a number of the IHR core capacities into law, providing a thorough legislative basis for their implementation. The *Biosecurity Act 2015* has provisions that allow temporary measures under the IHR (2005) to be implemented, to enable response during a PHEIC, ensuring flexibility in maintaining compliance with the IHR.

Areas that need strengthening/challenges

- The *National Health Security Act 2007* entered into force more than 10 years ago. Since then, there have been a number of significant national and international health security developments, including public health threats such as the outbreak of Ebola in West Africa, that have resulted in changes to systems and policy approaches.
- There have also been technological advances in communicable disease surveillance and control that have affected the way in which information is gathered and used.

IHR coordination, communication and advocacy

Introduction

The effective implementation of the IHR requires multisectoral/multidisciplinary approaches through national partnerships for efficient and alert response systems. Coordination of nationwide resources, including the designation of a national IHR focal point, which is a national centre for IHR communications, is a key requisite for IHR implementation.

Target

Multisectoral/multidisciplinary approaches through national partnerships that allow efficient, alert and responsive systems for effective implementation of the IHR (2005). Coordinate nationwide resources, including sustainable functioning of a national IHR focal point – a national centre for IHR (2005) communications which is a key requisite for IHR (2005) implementation – that is accessible at all times. States Parties provide WHO with contact details of national IHR focal points, continuously update and annually confirm them.

Australia level of capabilities

A formal process of information sharing between state and territory governments and the Australian Government for alert and response has been established. These obligations are included in the *National Health Security Act 2007* and supported by the National Health Security Agreement that facilitates the timely exchange of information for effective notification and national or international response as required. The IHR NFP is housed within the DoH with a focal point at the National Incident Room (NIR) available 24 hours, seven days a week.

Key structures supporting the national system include the Australian Government Crisis Management Framework (AGCMF) and whole-of-government crisis response committees; the Office of Health Protection (OHP), which manages Australia's IHR NFP; and the AHPPC and associated standing committees. These structures provide links to a range of information sources, including animal and human health surveillance units and laboratories.

Australia has established legislation under the *National Health Security Act 2007* and overarching frameworks such as the AGCMF and NatHealth Arrangements both of which support the coordinated response to public health threats and emergencies. In addition, cross-agency and cross-sectoral representation on committees, are in place to provide communication and coordination between the various Australian government agencies and information sources. The AHPPC is supported by standing committees, which provides cross-jurisdictional collaboration in public health planning, preparedness and response in relation to public health emergencies within Australia's national system.

Recommendations for priority actions

- Use the lessons identified through exercises and after-action reviews (AARs) to update health emergency plans in a timely manner and share with stakeholders as appropriate.
- Formalize annual feedback on the status of IHR(2005) implementation to relevant stakeholders through stakeholder meetings and annual report.
- Further empower the IHR NFP in disseminating information to, and consolidating input from, relevant sectors.

Indicators and scores

P.2.1 A functional mechanism established for the coordination and integration of relevant sectors in the implementation of IHR – Score 5

Strengths/best practices

- National standard operating procedures (SOPs) exist for a range of emergency management procedures.
- Multisectoral, multidisciplinary coordination and communication mechanisms are updated and tested regularly as part of the IHR NFP functions, and functional cross-agency exercises are held.
- Whole-of-government AARs are conducted for significant events, with recommendations made on potential improvements. Recent reviews have identified the need to improve cross-agency communication and reporting during a response.
- State and territory governments engage in intersectoral collaboration between relevant government agencies, to maintain oversight of jurisdictional health security risks.
- Multisectoral and multidisciplinary coordination and communication mechanisms are updated and tested regularly as part of the IHR NFP functions. Whole-of-government AARs and functional exercises (e.g. WHO Regional Office for the Western Pacific [WPRO] IHR Exercise Crystal 2016, Exercise CURIEosity, Exercise Panda 2014, Exercise Galaxy 2017) and table top exercises are held internally and externally with other Australian Government agencies and international organizations.
- Australia IHR NFP participated in the WPRO IHR Exercise Crystal to evaluate the functions of the IHR NFP.

Areas that need strengthening/challenges

- There is no formal mechanism for reporting from the OIE National Delegate within the DAWR to the IHR NFP where they may be potential public health risks identified by the DAWR.
- There is no standardized process to ensure that the lessons learnt and best practices are incorporated into emergency plans and processes.

Antimicrobial resistance

Introduction

Bacteria and other microbes evolve in response to their environment and inevitably develop mechanisms to resist being killed by antimicrobial agents. For many decades, the problem was manageable as the growth of resistance was slow and the pharmaceutical industry continued to create new antibiotics.

Over the past decade, however, this problem has become a crisis. Antimicrobial resistance is evolving at an alarming rate and is outpacing the development of new countermeasures capable of thwarting infections in humans. This situation threatens patient care, economic growth, public health, agriculture, economic security and national security.

Target

Support work coordinated by FAO, OIE and WHO to develop an integrated global package of activities to combat antimicrobial resistance, spanning human, animal, agricultural, food and environmental aspects (i.e. a One Health approach). Each country has: (i) its own national comprehensive plan to combat antimicrobial resistance; (ii) strengthened surveillance and laboratory capacity at the national and international levels following international standards developed as per the framework of the Global Action Plan; and (iii) improved conservation of existing treatments and collaboration to support the sustainable development of new antibiotics, alternative treatments, preventive measures and rapid point-of-care diagnostics, including systems to preserve new antibiotics..

Australia level of capabilities

Australia has a strong and continuously growing system in place for antimicrobial resistance (AMR) detection, surveillance, and antimicrobial stewardship (AMS) in the human health sector. The DAWR is completely engaged and is moving forward in addressing AMR and antimicrobial use (AMU) in the animal health sector. However, current capacity is the animal health sector is less mature than that of the human health sector in addressing AMR and AMU. The DAWR is currently establishing the scientific information base on which to develop programmes in the animal health sector. Systems and guidance for reducing health care acquired infections (HCAI) and for infection prevention and control (IPC) generally are well established in both the human health and animal health sectors. All AMR and AMU activities are applied especially in hospital settings, with less reach into community and primary care settings.

Overall, there is a relatively low level of AMU in the country, though use varies by sub-population and by sector. There are higher rates of AMU in some Aboriginal populations, but given a different spectrum of diseases, this may be appropriate. In the animal health sector, the rearing and finishing of food animals relies on extensive pasture-based production systems that require only very limited use of antimicrobials to maintain animal welfare and production.

Although Australia does not have a National Action Plan as such, the jointly-developed *National Antimicrobial Resistance Strategy 2015-2019* and associated *AMR Implementation Plan 2015-2019* for the National Strategy are based on the Global Action Plan for AMR and are signed by the Minister of Health and the Minster of Agriculture and Water Resources, and thus together fulfil the function of a National Action Plan. The development of the AMR Implementation Plan was overseen by the AMR Prevention and Containment (AMRPC) Steering Group, which is led by the Secretaries of DoH and DAWR, and includes the Chief Medical Officer (CMO) and Chief Veterinary Officer (CVO) as members. The Australian Strategic and Technical Advisory Group (ASTAG) on AMR provided guidance during development of the AMR Implementation Plan.

The National Antimicrobial Resistance Strategy and AMR Implementation Plan include seven common objectives applicable across the human health, animal health and agricultural sectors, which aim to minimise the development and spread of AMR and ensure the continued availability of effective antimicrobials. Measures to ensure detection, surveillance, IPC, and antimicrobial stewardship (AMS) - the four JEE-relevant indicators - are all laid out in the comprehensive AMR Implementation Plan.

The CMO and CVO jointly lead the AMRPC Steering Group that now oversees the delivery of the AMR Implementation Plan and provides overall AMR leadership and coordination. The DoH and the DAWR liaise with stakeholders in their respective sectors to implement the plan. The ASTAG continues to provide strategic, technical, scientific and clinical advice to the AMRPC Steering Group. The AMRPC Steering Group is also responsible for monitoring implementation of the plan, with support from ASTAG, including annual review and public reporting on progress. The first report summarised key achievements, challenges, and next steps against the seven objectives from the human health and animal health sectors and throughout the jurisdictions and was published in November 2017. It is planned to update the National Antimicrobial Resistance Strategy and AMR Implementation Plan within two years, representing a system for continuous improvement of the plan.

National lists of priority organisms and their associated antimicrobial medicines and of Critical Antimicrobial Resistances (CARs) direct human health surveillance efforts. All organisms listed in the JEE tool are included in the CAR list. Development of a list of bacteria and associated antimicrobial medicines for the animal health sector will be based on outcomes of surveys of AMR currently being conducted in animal populations.

A variety of systems and networks provide comprehensive coverage of AMR diagnostics, surveillance, and AMS in the human health sector and for implementation of IPC in both the human health and animal health sectors, taking a "data informing action and driving policy" approach.

There are not specifically designated laboratories, sentinel sites for surveillance, or designated centres for AMS within the human health system. However, there are systems that fulfil those functions for human health. Firstly, the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System, established by the Australian Commission on Safety and Quality in Health Care (ACSQHC), is a comprehensive national system for coordinated surveillance of AMR and AMU in the human health sector. AURA collates, analyses, and reports data from national and subnational hospitals and the community, to inform risk management measures for AMR. All organisms on the national priority list are included. Secondly, the Australian Group on AMR (AGAR) network of 31 laboratories, established in 1985, performs continuous AMR surveillance and testing of blood cultures for *Staphylococcus aureus, Enterobacteriaceae, Pseudomonas aeruginosa, Acinetobacter spp.,* and *Enterococcus spp.* from 33 public and private hospitals. Thirdly, the National Alert System for Critical Antimicrobial Resistances (CARAlert) provides information on the volume and frequency of CARs in priority organisms from the 28 participating hospital and community laboratories. Furthermore, there are other systems as described in the JEE Self Evaluation that have been in place for over five years.

Bacterial isolates from livestock and pet animals routinely undergo antimicrobial susceptibility testing (AST), especially for directing clinical antimicrobial use. However, there is no system for routine AST or surveillance in animal health. Some AMS practices are in place in certain animal health facilities.

"Proof of concept" AMR surveillance projects and surveys have been undertaken or are being planned in specific animal populations and contexts. The "Surveillance and Reporting of Antimicrobial Resistance and Antibiotic Usage in Animals and Agriculture in Australia" report was commissioned by the DAWR and delivered in 2014 by the University of Adelaide and Griffith University to comprehensively analyse the current situation and options for development of a surveillance and reporting system for AMR and AMU in animals and agriculture, including a proposed list of important bacteria and associated antimicrobial medicines. Information from these projects will provide the information base for developing AMR and AMU programmes for animal health in Australia.

Information on AMR and AMU from the animal health sector is not routinely disseminated. Despite several overlapping systems for collection and analysis of AMR and AMU information within the human health system, there is limited networking and sharing of AMR-relevant information from humans both across the jurisdictions and between the human and animal health sectors.

Recommendations for priority actions

- Extend detection, surveillance, IPC and stewardship to non-hospital (primary care and community) settings.
- Align antimicrobial susceptibility testing methodology across the country, including a balance of testing by genome sequencing and Polymerase Chain Reaction (PCR) with traditional culture and sensitivity.
- Establish a plan for AMR surveillance and antimicrobial susceptibility testing and reporting in the animal health sector based on risk assessment, and following further assessment, consider including food.
    - Include in the plan the requirement and mechanisms for (1) reporting of AMR in microbial agents from animals to subnational level and DAWR and (2) information sharing between DAWR and DoH.
- Create a mechanism for routine communication, coordination, and collaboration for AMR-related assessment, planning, and response (including outbreaks) across all jurisdictions and sectors (at least animal, human, food, and environment).

Indicators and scores

P.3.1 Antimicrobial resistance detection – Score 4

Strengths/best practices

- All laboratories conduct AST on bacteria isolated from animals and humans and the AST tests being used are accredited by the National Association of Testing Authorities under appropriate International Organization for Standardization (ISO) standards.
- Laboratories conducting AST on bacterial isolates from humans and animals participate in proficiency testing schemes.
- In the human health sector, 144 laboratories undertake AST on priority organisms from the national priority list. Of these, 28 laboratories conduct confirmatory testing on CARs and report to the DoH through CARAlert.
- CARAlert laboratories are further specialised and can perform molecular confirmation of AMR, as needed.
- Data from the human health sector are captured by a variety of surveillance systems at the national and subnational levels, and are also rapidly reported back to clinicians to direct care, especially in critical patients.
- Medicare uniformly funds AST in the human health sector.
- There is no coordinated network for testing of isolates from animals, but a CARAlert - type system is being considered.
- AST on bacterial isolates from animals is based on national standards, in line with OIE (World Organisation for Animal Health) standards.
- Information from AST on isolates from animals is reported back to the submitting veterinarian, and sometimes publicly through scientific papers.

- During outbreaks of zoonotic AMR or if there is a need for further characterisation of AMR in bacterial isolates, specimens are routinely shared among laboratories conducting AST on isolates from animal and humans throughout the country, and the Australian Animal Health Laboratory.
- Increasingly, institutions (including the Microbiological Disease Unit Public Health Laboratory at the University of Melbourne, the Victorian Infectious Diseases Reference Laboratory, and academic institutions) do genomic AMR testing on isolates from humans and animals. These data are being used to conduct molecular epidemiological investigations of some outbreaks.

Areas that need strengthening/challenges

- There is no national reference laboratory for AMR in either the human health or animal health sectors. For human health, existing laboratories fulfil all AMR reference laboratory functions except standardisation of testing methodologies.
- AST methodologies vary within and among laboratories testing for AMR in isolates from humans and animals, affecting the ability to align and compare data within the human health and animal health sectors, and between the human and animal health sectors in the future.
- As whole genome sequencing and PCR methods are increasingly used, there is a risk that traditional culture and sensitivity information, needed for a more granular understanding of resistance characteristics, will become less available.
- There is no agreed list of priority pathogens to direct AST for animal health.
- There is no coordinated system for AST in the animal health sector, nor structured reporting of AMR up through jurisdictions, nor from jurisdictions to DAWR.
- Although there is a desire to use the AURA database to capture information from the animal health sector in the future, laboratory data from animals are currently not routinely included in existing AMR-related systems and structures e.g. AURA, AGAR, and CARAlert networks.

P.3.2 Surveillance of infections caused by antimicrobial-resistant pathogens – Score 4

Strengths/best practices

- Information on AMR in bacteria isolated from humans, including on CARs, is collected and available through a variety of surveillance systems and networks and is analysed and used to direct AMR and AMU programmes at the facility, jurisdictional, and national level.
- There is regular high-level review of the national priority pathogen list for human health, based on information from the surveillance systems.
- Pilot projects and surveys of AMR and/or AMU in specific animal populations and contexts throughout the country have or will be conducted, including on *E.coli, Salmonella* spp., *Enterococcus* spp. and *Campylobacter* spp. in pigs and chicken meat, salmonella in poultry and eggs, AMR in bacteria collected from abattoirs, and in aquaculture facilities raising salmon. Pharmaceutical companies have financially supported studies looking at resistance in companion animals.
- Pilots and studies in animals are based on OIE standards, and will evaluate costs, processes, and sustainability to inform development of functional surveillance systems, and will collect AMR-specific data on which to base a list of priority bacteria to include in the surveillance system in the future.
- Inclusion of surveillance for AMR bacteria in food is being considered. A literature review is planned to investigate risks, impacts, and feasibility.
- A strategic coordination group including representation from the environment sector will be considering risks of AMR bacteria from water, soil and the broader environment.

Areas that need strengthening/challenges

- The surveillance systems in the human health sector may not be systematically capturing AMR information from the community level or from primary care.
- AMR in bacteria isolated from animals is not notifiable and so information is not being captured, and is thus escaping analysis and consideration in management measures.
- Improving capture of AMR patterns in Indigenous populations is not referenced in either the National Antimicrobial Resistance Strategy or the associated AMR Implementation Plan.
- There is no national system for AMR surveillance in animals, and currently no national government or industry funding to do so.
- Academic institutions hold valuable information which may only become available through scientific publications.

P.3.3 Health care-associated infection (HCAI) prevention and control programmes – Score 5

Strengths/best practices

- The National Safety and Quality Health Service (NSQHS) Standards were endorsed in 2011 and accreditation against the Standards commenced for all hospitals in 2013. Standard 3 (Preventing and controlling healthcare associated infections), requires hospitals to implement measures to prevent healthcare-associated infections.
- There are a number of other mechanisms and standard guidance for IPC in human health settings, including the National Hand Hygiene Initiative (2009), the Australian Guidelines for the Prevention and Control of Infection in Healthcare (2010), and the Recommendations for the Control of Carbapenemase-Producing *Enterobacteriaceae* (CPE): A Guide for Acute Care Health Facilities.
- In animal sector settings, IPC measures have been applied routinely for a number of years. All small animal clinics apply IPC measures and large animal farms have strict biosecurity measures in place to prevent entry and spread of infectious diseases.
- Resources for IPC in animal health include the Guidelines for Veterinary Personal Biosecurity (issued by the Australian Veterinary Association in January 2017) to aid veterinarians and animal handlers in reducing risk of contracting zoonotic diseases. This document includes, as Appendix 1, a model infection control plan for veterinary practices.

Areas that need strengthening/challenges

- The national plan for control of a specific HCAI (for CPE) for acute health care facilities has not yet been extended to other facilities including community health care facilities.
- Despite the routine application of IPC measures in human and animal health settings, all activities are not consolidated into a single effort in either of the sectors.

P.3.4 Antimicrobial stewardship activities – Score 4

Strengths/best practices

- Overall, low levels of antimicrobial medicines are used in the country in animal health.
- The AMR Strategy and Plan comprehensively describe key elements and activities of AMS in both animal and human health settings.
- Comprehensive guidance on AMS and prescribing practices are available for both human and animal health.
- Science-based risk assessment is routinely used to direct AMU, e.g. for determining prescribing practices and to direct import of antimicrobial medicines for agricultural use.

- The National Centre for Antimicrobial Stewardship (NCAS), sitting in the Doherty Institute in Melbourne, is funded by the National Health and Medical Research Council of Australia. The NCAS comprises experts from a variety of sectors and disciplines, and takes a multisectoral, multidisciplinary ("One Health") approach to understanding AMU nationally.
- General practitioners and veterinary practitioners are increasingly aware of their role in AMS in both the human and animal health settings.
- AMS is a requirement under the NSQHS Standard 3, which is uniformly applied in hospital settings and is linked to accreditation. Guidance on prescribing and AMS have been in place in human health settings for many years based on previous standards.
- In addition to National Safety and Quality Health Service Standard 3, comprehensive guidance and programmes on AMS and prescribing practices includes the Antimicrobial Stewardship Clinical Care Standard (2014), and the MedicineWise and Medicine Insight programmes.
- Public and private human hospitals in all jurisdictions generally have strong AMS programmes including education and outreach for staff and patients, and may include analysis of their own antibiograms to re-direct AMS programmes and prescribing guidelines, especially for critical patients.
- Prescriptions are required for dispensing most antimicrobial medicines for human use. Some last line antimicrobial medicines can only be prescribed by specialist health doctors.
- The National Antimicrobial Prescribing Survey currently undertakes national surveys annually in hospitals, for surgical episodes, and in aged care settings, to evaluate AMS practices in these settings (from over 600 sites in 2016), and is expanding coverage into general practices and the veterinary sector. Prescribing pattern information can be used in development of decision support guidelines nationally.
- Guidance on AMS is available for the animal health sector, including the guidelines developed by the National Centre for Antimicrobial Stewardship animal stream, and Antibiotic Prescribing—Detailed Guidelines (2010) issued by the Australasian Infectious Diseases Advisory Panel Centre for Veterinary Education.
- The animal health sector has broadly accepted an AMS frame, and development of a formal national system is ongoing.
- Prescriptions are required for purchasing most antimicrobial medicines for animals.
- Currently, floroquinolones are not registered for use in food-producing animals, and no fourth generation cephalosporins or carbapenems are registered by the Australian Pesticides and Veterinary Medicines Authority (APVMA) for use in animals. There is a formal list in development of critical antimicrobial medicines not allowed to be used in animals.
- There are currently efforts to phase out non-clinical use of antimicrobial medicines in animals, although most medicines currently being used in these contexts are not relevant to human AMR concerns.
- New vaccines for local diseases (e.g. specific diseases of salmon) are being developed to lower AMU.
- Antimicrobial residues in food are closely monitored.
- Australia provided AMU data to OIE in 2015, 2016 and 2017.

Areas that need strengthening/challenges

- There is a higher use of antimicrobial medicines in community health care centres compared to hospital settings.
- Stewardship activities mostly focused on human hospital structures and do not penetrate to community level/primary care or into animal health care settings at the community level.
- Improving capture of AMU patterns in Indigenous populations is not referenced in either the National Antimicrobial Resistance Strategy or associated AMR Implementation Plan.
- Antimicrobials are still used in animals in some non-clinical situations, including for prophylaxis in intensive production systems. Off-label use (under the supervision of a veterinarian) is allowed. The levels of use in some contexts, e.g. salmon farming, have not yet been determined.
- There is no system or capacity to measure AMU or prescribing practices in animals. Only bulk information on import of antimicrobial medicines is currently available.

Zoonotic diseases

Introduction

Zoonotic diseases are communicable diseases that can spread between animals and humans. These diseases are caused by viruses, bacteria, parasites and fungi carried by animals, insects or inanimate vectors that aid in their transmission. Approximately 75% of recently emerging infectious diseases affecting humans are of animal origin; and approximately 60% of all human pathogens are zoonotic.

Target

Adopted measured behaviors, policies and/or practices that minimize the transmission of zoonotic diseases from animals into human populations.

Australia level of capabilities

Australia has minimised its risk of zoonotic disease emergence and importation through the development and implementation of a clear cross-sectoral strategy for the robust surveillance of zoonotic diseases, and maintaining a high level of biosecurity in all states and territories, and at border controls. It has particularly addressed priority zoonotic diseases, with a number of priority zoonotic diseases of public health concern included in surveillance systems of both human and animals. Those of major concern include anthrax, Australian Bat Lyssa virus, zoonotic influenza, Japanese encephalitis, rabies, salmonellosis (*S. enteritidis*), tularaemia, viral haemorrhagic fevers, and West Nile/Kunjin virus. Priority zoonotic disease status is actively reviewed by the DoH and the DAWR. Lists of zoonotic diseases notifiable in both humans and animals are updated as necessary by both sectors, with the list of zoonotic diseases notifiable in animals currently undergoing revision. Legislation and policy documents define those zoonotic diseases which are nationally and internationally notifiable, although not all zoonotic diseases of public health importance are notifiable in animals.

Australia has established a surveillance coordination mechanism for human health, the National Notifiable Diseases Surveillance System (NNDSS), although information from the animal health sector is not included in this system. However, the DoH and the DAWR have a Memorandum of Understanding (MoU) to work in partnership to detect and respond to zoonotic disease outbreaks. This partnership has included several joint assessments of animal disease risks to human health, and includes agreeing upon SOPs and response guidelines to minimise the risks of, and to manage, zoonotic events. There is a national emergency response plan and designated response committee to coordinate all relevant stakeholders in the event of an emergency pertaining to a potentially-zoonotic animal disease outbreak. Australia has the capacity to respond to the majority of zoonotic disease animal outbreaks within a specified time frame for the protection of human health, with more rapid response schedules for high-priority zoonotic diseases.

There is a strong national laboratory capacity to detect cases of zoonotic diseases, with specimens and information sharing between human and animal health laboratories; although there are some variations between human and animal health laboratory case definitions. Reports of zoonotic events are regularly shared between the animal and human health sectors, and diseases of important significance are reported internationally as required to the WHO and the OIE, although this reporting is not routinely communicated within the country between the OIE National Delegate and IHR NFP.

Training in zoonotic diseases is covered in both veterinary and medical school and graduate programme curricula; and in-service continuing education and training for veterinary and biosecurity staff is provided by the DAWR and state and territory governments.

One Health working groups and communications have been established between animal and human health agencies, and these and other One Health collaborations contribute to Australia's continuous efforts to improve its surveillance and management of serious zoonotic disease risks.

Recommendations for priority actions

- Introduce a formal process through committee structures between DoH and DAWR to regularly review a joint list of priority zoonotic diseases.
    - Consider designating zoonotic diseases of public health importance in Australia as nationally notifiable in animals.
- Establish a dedicated multisectoral national zoonosis committee or ensure reciprocal animal and human sector representation on their respective national zoonotic disease-related committees to enhance communications, bridge knowledge gaps and strengthen collaborative responses.
- Consider standardizing/aligning laboratory case definitions and typing between human and animal health sectors to enhance data comparison of their surveillance systems.

Indicators and scores

P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens – Score 5

Strengths/best practices

- Established systems are in place in all states and territories for the ongoing surveillance of all high-priority zoonotic diseases in both humans and animals, including wildlife, livestock and domestic animals.
- Strong biosecurity systems and quarantine procedures reduce the risk of the importation of zoonotic diseases through animals or their products, and from people arriving from overseas.
- Risk assessments relating to national biosecurity and some animal disease risks to human health are jointly conducted by the DoH, DAWR and other Australian Government agencies.
- There is a strong national laboratory capacity to detect cases of zoonotic diseases, with specimens and information sharing between human and animal health laboratories.
- Australia's capacity for the early detection of significant disease incidents in livestock and wildlife (including potentially emerging diseases) is augmented by the funding of private veterinarians to conduct full investigations under the National Significant Disease Investigation Program.
- There is a designated committee, the Consultative Committee on Emergency Animal Diseases (CCEAD) to coordinate response in the event of an emergency animal disease outbreak.
- Reports of zoonotic diseases are also shared regularly between the animal and human health sectors, with diseases of important significance immediately reported internationally as required to WHO and the OIE.
- Cross-agency initiatives in jurisdictions such as the Zoonoses Working Group of the South Australian Government seek to specifically improve surveillance and management of zoonotic diseases and to enhance related communications.

Areas that need strengthening/challenges

- The DoH and the DAWR do not have an integrated system to regularly review and formalise a joint list of priority zoonotic diseases.
- Private animal health laboratory test results are not always conveyed to public health authorities, unless they detect a disease that is notifiable in animals.
- Data comparison of various surveillance systems may sometimes be difficult to due to variation in laboratory case definitions and typing methods between the human and animal health sectors.
- There is currently no formal mechanism for the reporting of potential public health risks between the OIE National Delegate within the DAWR and the IHR National Focal Point within the DoH.

P.4.2 Veterinary or animal health workforce – Score 5

Strengths/best practices

- Both veterinary and human medicine university curricula address zoonotic disease training, with the Australian National University (ANU) offering a Master of Philosophy in Applied Epidemiology (MAE) – in which veterinarians participate. Many other universities also offer post-graduate degree courses in epidemiology and public health to a wide range of students, including veterinarians and medical doctors.
- The DAWR, state and territory governments provide in-service continuing education and training for veterinary and biosecurity staff.
- A number of One Health working groups and communications have been established between animal and human health agencies to bridge zoonosis knowledge gaps and to strengthen collaborative responses.

Areas that need strengthening/challenges

- The criteria for a score level 5 are well-met, and there is a strong foundation to continue to broaden One Health opportunities for shared training and research.

P.4.3 Mechanisms for responding to infectious and potential zoonotic diseases established and functional – Score 5

Strengths/best practices

- Emergency Animal Disease Operational Response Plans are developed by each jurisdiction, with state and territory Chief Veterinary Officers leading emergency responses and relevant services, programmes and communications. Initiatives have been instituted to maximise the ability and availability of private veterinarians to assist during emergency animal disease responses.
- There are national response plans and manuals for specific zoonotic diseases that have been developed and formally agreed between the DOH and DAWR, including policies and procedures for the management of crises through whole-of-government coordination of roles and responsibilities.
- There is a designated committee, the CCEAD, which can be convened to coordinate responses in the event of an emergency animal disease outbreak, with the DoH participating as appropriate.
- There is national capacity to respond to of the majority of zoonotic disease outbreaks within a specified time frame for the protection of human health, with more rapid response schedules for high-priority zoonotic diseases.
- An additional capacity to respond to infectious and zoonotic disease outbreaks can be provided by both MAE programme scholars and the Australian Response Masters of Applied Epidemiology (ARM) network.

- In the event of an emergency disease outbreak, state or territory activities can be coordinated in accordance with disease transmission and control direction provided by the CVO, CCEAD, and the National Management group.
- The notification of reports of zoonoses is supported by national animal health and human health legislation, and reports on the occurrence of emergency animal diseases and diseases of important significance are immediately reported internationally as required to the WHO and the OIE.

Areas that need strengthening/challenges

- Zoonoses of public health importance in Australia, such as Murray Valley encephalitis, should be considered for designation as nationally notifiable in animals.

Food safety

Introduction

Food- and water-borne diarrhoeal diseases are leading causes of illness and death, particularly in less developed countries. The rapid globalization of food production and trade has increased the potential likelihood of international incidents involving contaminated food. The identification of the source of an outbreak and its containment is critical for control. Risk management capacity with regard to control throughout the food chain continuum must be developed. If epidemiological analysis identifies food as the source of an event, based on a risk assessment, suitable risk management options that ensure the prevention of human cases (or further cases) need to be put in place.

Target

Surveillance and response capacity among States Parties for food- and water-borne disease risks or events by strengthening effective communication and collaboration among the sectors responsible for food safety, and safe water and sanitation.

Australia level of capabilities

Australia has a strong interest in maintaining a high level of biosecurity, including enforcing risk reduction measures for security of borders and rapidly responding to outbreaks of potentially foodborne diseases to maintain the health of Australians and the health of animals, and to protect the significant animal product export industry.

There are many technical and policy structures and agencies in place for food and food-borne disease related surveillance, testing, and event response nationally, among the jurisdictions and across the different sectors (e.g. human, animal and food). Together, these comprise a comprehensive and functional, if complex, food safety system. All national level structures include input from or coordinate with the jurisdictions.

At the national level, an independent statutory agency, Food Standards Australia New Zealand (FSANZ), established by the *Food Standards Australia New Zealand Act 1991*, is responsible for developing and maintaining the Australia New Zealand Food Standards Code. FSANZ is a statutory authority in the Australian Government Health portfolio, with all decisions relating to national food incidents considered by all jurisdictions. FSANZ is Australia's International Food Safety Authority Network (INFOSAN) Emergency Contact Point, and the DAWR and the DoH are the INFOSAN Focal Points. The Australia New Zealand Food Standards Code is adopted without variation into jurisdictional legislation to support the harmonization of standards, despite being responsible for creating their own food safety legislation. Jurisdictions may have additional legislative provisions, including for audits and inspections.

A ministerial forum, the Australia and New Zealand Ministerial Forum on Food Regulation, coordinates with the Food Regulation Standing Committee. These entities oversee the Binational Food Safety Network (BFSN) to undertake coordination, information sharing, communication and implementation of the National Food Incident Response Protocol (NFIRP) during national food incidents. BFSN is often used for communication before more formal actions are implemented. The NFIRP allows food regulators to appropriately respond to food incidents in a timely and coordinated manner including descriptions of roles and responsibilities, and is coordinated by FSANZ and overseen by the Implementation Subcommittee for Food Regulation. The NFIRP was activated for two of four multijurisdictional outbreaks in 2016.

National food safety incidents occur infrequently; the majority of events occur at the jurisdictional level. Response lies with the jurisdictions, with coordination and support offered by national structures (FSANZ, OzFoodNet, the Public Health Laboratory Network [PHLN], BFSN, NFIRP, and the Communicable Diseases Network Australia [CDNA]) especially during multijurisdictional outbreaks. Diagrams and matrices are available to illustrate the interplay of roles and responsibilities in a variety of different circumstances, including during response to outbreaks originating in different sectors.

OzFoodNet is the national surveillance system for foodborne diseases and conducts epidemiological investigations of foodborne illness. OzFoodNet is coordinated by the DoH, and members include FSANZ, the DAWR, PHLN and the jurisdictions. OzFoodNet is a member of the CDNA. Under the OzFoodNet programme of the National Partnership on Specified Projects, signed by all Australian States and Territories, all events involving two or more cases of potentially foodborne disease must be reported. During multijurisdictional outbreaks, OzFoodNet conducts the epidemiological investigation including tracing of potentially exposed people through the jurisdictions. At the national level, OzFoodNet's comprehensive review of jurisdictional information may identify clusters that wouldn't otherwise be identified.

For surveillance data, all information is shared through a CDNA meeting every two weeks and minutes shared widely. Sharing of surveillance information among sectors also occurs in some jurisdictions. Ongoing issues of national or jurisdictional concern, for example, recent concerns about *Listeria*, are being addressed with a move to coordinate disease surveillance and management among relevant sectors. The high incidence of salmonellosis in humans has been identified as a priority and is being addressed multisectorally. The CDNA and the Implementation Subcommittee for Food Regulation are key to this communication.

Laboratories testing samples from animals and food are mostly private. During event responses, these laboratories refer samples to PHLN enteric reference laboratories for further typing, and these reference laboratories work closely with OzFoodNet. Laboratories are obligated to report all notifiable diseases. For multi-jurisdictional outbreaks, states and territories still do the testing, but the national level can provide support and technical advice.

Roles during recalls are defined by FSANZ in the Food Industry Recall Protocol. Jurisdictions are responsible to oversee any food recall. Recalls include use of social media to alert consumers.

Engagement with industry has been identified as an area for strengthening. To improve routine sharing of information and to collaborate with industry on preparedness, response, and recovery for potential food safety issues among government (including jurisdictions), FSANZ convenes a large joint industry/government food incident forum that includes industry stakeholders throughout the food chain, from renderers to retailers. A joint government-industry exercise is being planned.

In summary, the food safety system in Australia is working well. Activities now concentrate on fine tuning, optimising and strengthening what already exists including the linkages among sectors.

Recommendations for priority actions

- Work towards an integrated multisectoral and multidisciplinary electronic surveillance and outbreak management system, coordinated by the DoH, that includes diagnostic and epidemiological data from food animals, food products, and humans.
- Identify and prioritise food safety/food chain issues of specific concern (e.g. salmonellosis) that require working across sectors to decrease incidence.
- Establish a mechanism to engage industry in monitoring and response.
- Establish standard national protocols to ensure some proportion of culture based testing.

Indicators and scores

P.5.1 Mechanisms for multisectoral collaboration established to ensure rapid response to food safety emergencies and outbreaks of foodborne diseases – Score 5

Strengths/best practices

- Strong and comprehensive legislation, guidance, and mechanisms are in place to effectively reduce risks of entry of foodborne pathogens, transmission of foodborne diseases, and response to food borne disease events.
- Multiple mechanisms are available for communication among all relevant stakeholders, including across sectors and jurisdictions.
- Matrices, diagrams, and guidance are available for defining roles and responsibilities during outbreaks.

Areas that need strengthening/challenges

- There is no single point of coordination and communication among the large number of agencies, mechanisms, and processes that are involved in food safety surveillance and event response.
- Several foodborne diseases, including campylobacteriosis and salmonellosis, have been identified as national concerns.
- Much information sits within the commercial animal health industry and is not currently available to public or animal health sectors.

Biosafety and biosecurity

Introduction

It is vital to work with pathogens in the laboratory to ensure that the global community possesses a robust set of tools – such as drugs, diagnostics, and vaccines – to counter the ever-evolving threat of infectious diseases.

Research with infectious agents is critical for the development and availability of public health and medical tools that are needed to detect, diagnose, recognize and respond to outbreaks of infectious diseases of both natural and deliberate origin. At the same time, the expansion of infrastructure and resources dedicated to work with infectious agents have raised concerns regarding the need to ensure proper biosafety and biosecurity to protect researchers and the community. Biosecurity is important in order to secure infectious agents against those who would deliberately misuse them to harm people, animals, plants or the environment.

Target

A whole-of-government national biosafety and biosecurity system with especially dangerous pathogens identified, held, secured and monitored in a minimal number of facilities according to best practices; biological risk management training and educational outreach conducted to promote a shared culture of responsibility, reduce dual-use risks, mitigate biological proliferation and deliberate use threats, and ensure safe transfer of biological agents; and country-specific biosafety and biosecurity legislation, laboratory licensing and pathogen control measures in place as appropriate.

Australia level of capabilities

Australia has been a global leader in the area of developing systems for biosafety and biosecurity since the mid-1980s. In 1985, Australia founded the Australia Group which lay the foundation on a number of international processes and national regulations for the safe and secure handling of dangerous pathogens and rules around their dual use. In addition, Australia has very strict importation and border control legislation that regulates the importation of any materials which could potentially contain pests, foreign invasive species and pathogens or their vectors which are not present in the country.

The country has a comprehensive legislative base that sets down the rules of conduct for laboratories working on potentially dangerous pathogens, covering both the human and agricultural sectors. This scheme ensures that especially dangerous pathogens are identified, held, secured and monitored in a minimal number of facilities according to best practices and biological risk management training.

Several agencies are responsible for and have arrangements in place to govern the implementation of biosafety and biosecurity requirements, including monitoring and compliance.

The Security Sensitive Biological Agent (SSBA) Regulatory Scheme regulates the handling of a specific list of biological agents deemed to be of security concern to Australia. The *National Health Security Act 2007* establishes the scheme for entities and facilities that handle suspected or known SSBAs. The *National Health Security Regulations 2008* and the SSBA Standards provide the operational detail for which facilities authorised to handle SSBAs must comply.

Genetically modified organisms (GMOs) are regulated under the *Gene Technology Act 2000*. The Gene Technology Regulator is an independent statutory office holder responsible for administering the *Gene Technology Act 2000*, and its corresponding state and territory laws.

The *Biosecurity Act 2015* requires that imported high-risk biological material be held in a facility that is approved by the DAWR under an approved arrangement. Assessment and issue of biological import permits is also covered by the *Biosecurity Act 2015*. The *Gene Technology Act 2000*, the *Biosecurity Act 2015* and their subordinate legislation contain biosafety requirements for the possession and handling of potentially dangerous organisms.

The Legislative and Governance Forum on Gene Technology oversees Australia's gene technology regulatory scheme. The Legislative and Governance Forum on Gene Technology comprises ministers from the Australian Government and state and territory governments from a range of portfolios, including health, agriculture and primary industries.

Facilities that handle SSBAs, GMOs or other high-risk pathogens or toxins must follow the appropriate legislation and standards, which include requirements for:

- monitoring, assessment and compliance
- physical containment (PC) (including access control) and operational practices
- personnel safety, security and training
- risk assessment and management
- information security
- waste management
- incident and accident reporting.

The SSBA Regulatory Scheme and the Office of the Gene Technology Regulator both specify minimum training requirements for laboratory staff that handle SSBAs or GMOs. General biosafety training is the responsibility of regulated facilities and institutions.

Transportation of SSBAs, GMOs and other high-risk organisms is regulated by the Australian Dangerous Goods Code for Road and Rail, the National Pathology Accreditation Advisory Council (NPAAC) Requirements for the Packaging and Transport of Pathology Specimens and Associated Materials, Australian Standard AS4834-2007—Packaging for Surface Transport of Biological Material that may Cause Disease in Humans, Animals and Plants, the Regulator's Guidelines for the Transport, Storage and Disposal of GMOs and the *Civil Aviation Safety Regulations 1998*.

Laboratories across all fields of work must comply with the biorisk management regulations (research and public health, industry, clinical and veterinary) and training as well as inspections are required. There are multiple levels of accreditation, certification and licencing requirements for laboratories, effectively ensuring that pathogens are handled by competent staff, in appropriately constructed laboratories and with good control of specimens and the procedures employed. Staff background checks are in place and only appropriately authorized personnel have access to the biological materials.

There are a substantial number of Australian laboratories operating under biosafety level (BSL) 3 and several that have BSL-4 capability.

National level resources for fulfilling the biosecurity schemes are secured, at least for the immediate near future.

In addition to national activities, the Australian Government has invested strongly in international and regional support activities, transferring technology and expertise to a number of countries in WPRO in partnership with the WHO and other international collaborating partners.

Recommendations for priority actions

- Consider consolidating inspections and audits undertaken into single joint assessment visits for facilities operating under different regulatory frameworks and sectors (i.e. SSBA, Office of the Gene Technology Regulator, DAWR).
- Consider reviewing the regulatory framework to take into account risks of synthetic biology.

Indicators and scores

P.6.1 Whole-of-government biosafety and biosecurity system in place for human, animal and agriculture facilities – Score 5

Strengths/best practices

- Biosafety and biosecurity practices are comprehensively supported by legislation, regulations and standards and are in line with best practice internationally.
- Facilities demonstrate high level of commitment to compliance with biosafety and biosecurity requirements.
- The SSBA Regulatory Scheme has been a great success in terms of the development and implementation of a framework for the containment of dangerous pathogens and toxins.

Areas that need strengthening/challenges

- There is a need to review and, where practical, harmonise laboratory related regulatory activities across sectors to ensure proportionate regulation in line with risk.
- There is a need to further understand and scope the relatedness of existing biosafety oversight mechanisms to determine if improvement is needed.
- There is a need to assess the security threat posed by synthetic biology.

P.6.2 Biosafety and biosecurity training and practices – Score 4

Strengths/best practices

- Staff training is a key component of maintaining a quality laboratory system.
- For laboratories operating under the SSBA, GMO and 'approved arrangements' regulatory schemes, facilities are responsible for implementing training and ensuring that specified competency levels are achieved and maintained.
- Any tertiary course involving laboratory work or the handling of biological agents includes elements of biosafety and biosecurity.

Areas that need strengthening/challenges

- There is no nationally consistent training regime for biosafety or biosecurity.

Immunization

Introduction

Immunizations are estimated to prevent more than two million deaths a year globally. Immunization is one of the most successful global health interventions and cost-effective ways to save lives and prevent disease.

Target

A national vaccine delivery system – with nationwide reach, effective distributions, access for marginalized populations, adequate cold chain and ongoing quality control – that is able to respond to new disease threats.

Australia level of capabilities

Under the National Immunisation Program (NIP), the Australian Government funds the purchase of vaccines to protect all children and eligible Australians against vaccine preventable diseases. Some states and territories fund additional vaccinations (for extended indications not funded under the NIP) for eligible at-risk populations, such as pertussis vaccinations for pregnant women, Japanese encephalitis, seasonal influenza and tuberculosis.

Australia's NIP has proven to be extremely successful, with Australia's last case of locally acquired wild poliovirus reported in 1972. As part of the WHO Western Pacific region, Australia was declared polio free in 2000 and free of endemic measles in 2014. These are significant accomplishments for public health in Australia.

Although public support for vaccination is high, some parents remain concerned about the safety of vaccines. In Australia, approximately 93.6% of children at five years of age are fully immunised. Nevertheless, pockets of low coverage exist throughout Australia, and certain populations are more likely to have lower coverage, which puts communities at risk. Social marketing plays an important role in promoting vaccination in Australia. A campaign to provide parents with information about early childhood immunisation began in 2017 and will run until 2019. Australia is focusing on improving vaccination coverage across all regions. There is a need to improve levels of understanding about the benefits of vaccination, to overcome vaccine hesitation and objection in the community. Systematic and near real-time monitoring of uptake and effectiveness of vaccines in all target groups, including pregnant women, remains a challenge to be addressed.

Australia maintains a secure cold chain that ensures the safe delivery of vaccines across all states and territories. Electronic temperature monitors are fitted to vaccine storage units with an alarm that is activated when the temperature falls outside 2–8 °C.

Recommendations for priority actions

- Maintain and improve measles immunization coverage for all populations, in particular hard-to-reach populations (such as those in remote areas, Indigenous populations and migrant groups) and those in areas with lower coverage, to achieve 2020 target of 95%.
- Promote community confidence in the NIP through effective communication strategies that support immunisation and overcome vaccine hesitancy.
- Establish a single National Vaccination Registry that allows for detailed population-based analysis and reporting of vaccination coverage for all ages and at national, state, territory and local levels.
- Monitor variations in vaccine supply to minimise the impact on the delivery of the NIP.
- Identify and mitigate factors leading to vaccine wastage to ensure efficient use of vaccines.

Indicators and scores

P.7.1 Vaccine coverage (measles) as part of national programme – Score 5

Strengths/best practices

- In 2014, Australia was certified as having eliminated endemic transmission of measles by the WHO.
- Australia has a NIP that is aligned with the WHO Global Vaccine Action Plan, and includes additional vaccines for herpes zoster, meningococcal C, varicella and hepatitis A.
- The Australian Government funds the purchase of NIP vaccines, while state and territory governments deliver vaccinations through primary healthcare services. Aboriginal Medical Services ensure culturally appropriate vaccination services for Aboriginal and Torres Strait Islander people.
- High levels of coverage for the measles, mumps and rubella vaccine are reported with coverage for the first and second doses of MMR vaccine averaging 95% nationwide for 5 year olds in 2016 estimates.
- The Australian government is a strong supporter of vaccination and actively promotes community immunisation through a number of initiatives including free vaccinations, school-based programmes and makes some family assistance payments conditional on proof of immunisation.

Areas that need strengthening/challenges

- There is a need to increase levels of vaccine coverage in specific populations including those living in remote areas, and among Indigenous and migrant groups.
- Management of data regarding vaccine coverage.
- Vaccine hesitancy and the anti-vaccine movement to be countered through provision of better information.

P.7.2 National vaccine access and delivery – Score 5

Strengths/best practices

- Adequate government resources and mechanisms are in place for vaccine procurement, stockpiling, cold-chain infrastructure and distribution. This has ensured that no stock-outs have occurred at any level.
- Competitive vaccine procurement processes and contract management with preferred vaccine suppliers by the Australian Government ensures value for money and supply.
- A vendor-managed inventory system is used to distribute vaccines to healthcare providers throughout the country.

- Vaccine storage, packaging, transport and delivery are electronically monitored to ensure that vaccines remain at 2–8 °C.
- The Australian Government ensures awareness of the importance of immunisation through a range of resources and activities to support the NIP. Recent activities have promoted the 2017 NIP seasonal influenza vaccine during pregnancy and the National Shingles Vaccination Program.

Areas that need strengthening/challenges

- Australia currently relies on the importation of nearly all vaccines in the NIP with the exception of seasonal influenza vaccine; this makes the programme susceptible to potential delays in vaccine supplies from overseas manufacturers.
- The Australian Government and state and territory governments have agreed to manage wastage and leakage of NIP vaccines to improve the sustainability of the programme.
- There is no single national vaccination register available to capture all NIP and privately purchased vaccines given to people of all ages.

DETECT

National laboratory system

Introduction

Public health laboratories provide essential services including disease and outbreak detection, emergency response, environmental monitoring and disease surveillance. State and local public health laboratories can serve as a focal point for a national system, through their core functions for human, veterinary and food safety including disease prevention, control and surveillance; integrated data management; reference and specialized testing; laboratory oversight; emergency response; public health research; training and education; and partnerships and communication.

Target

Real-time biosurveillance with a national laboratory system and effective modern point-of-care and laboratory-based diagnostics.

Australia level of capabilities

Australia has a comprehensive network of microbiological laboratories, operating from both a public health and private platform. There are 333 laboratories accredited under ISO 15189:2012 for medical, microbiological testing. These laboratories are distributed across all eight Australian states and territories, with at least one nationally recognised PHLN reference laboratory in each jurisdiction.

Laboratories are classified into different categories in the national scheme according to the professional training of their staff, which determines the relative complexity of the testing done at that site. There are five such categories: 1) Category GX (General)—has more than two full-time-equivalent pathologists; 2) Category GY (General)—has at least one, and not more than two, full-time-equivalent pathologists; 3) Category B (Branch)—a laboratory that is either an integral part of a GX or GY laboratory, or is part of a regional pathology service; 4) Category M (Medical practice)—a laboratory that is based in a medical practice, under the supervision of a registered medical practitioner of that practice and 5) Category S (Specialised)—a laboratory in which limited tests/services are performed on a particular population or under the supervision of a person with specialised qualifications or skills.

Additionally, laboratories are stratified into one of four PC Levels (PC1–PC4; similar to the BSL-1-BSL-4 Biosafety level classification of the WHO), based on the structure and function of the laboratory to handle organisms and biological agents that present a certain level of risk. Australian medical, microbiological laboratories operate with a minimum PC2 level of containment, and a number of PC3 and PC4 facilities across jurisdictions can perform higher risk activities.

Australian laboratories have both the capacity and capability to perform testing for more than 10 priority diseases, including those required by the JEE assessment. In fact, the country has a wide capability of advanced clinical and research grade diagnostic testing. There are several high level research and public health laboratories (i.e. The Victorian Infectious Diseases Reference Laboratory [VIDRL] and the Australian Animal Health Laboratory [AAHL]) capable of performing analyses at the highest biosafety and biosecurity level (Four at PC4; 3 human and 1 animal) and using the latest technology (such as complete genome sequencing). The country has in the past also supported many other countries to develop their competencies in the laboratory sector and continues to do this through multiple initiatives.

The Australian Government funds most community diagnostic pathology testing in Australia through Australia's universal health scheme—the Medicare Benefits Schedule (MBS) —by a fee-for-service arrangement. Tests conducted under the umbrella of 'public health pathology' are not eligible for funding under the MBS arrangements used for diagnostic pathology.

Public diagnostic laboratories are state and territory institutions, often associated with medium to large hospitals. These laboratories undertake a mix of Medicare-funded (patient diagnostic testing) and non-Medicare funded (public health) testing. Private laboratories are mostly centralised in state capitals, with courier services that may extend interstate.

The three most populous states (New South Wales, Queensland and Victoria) have designated, partially state government-funded, public health reference laboratories. One large public laboratory in each of the other states and territories and one additional laboratory each from New South Wales and Queensland act as the leading public health reference laboratories for the jurisdiction in which they are located. The national role of all these public health laboratories is formally recognised through their membership on PHLN.

PHLN also includes representation from the WHO Collaborating Centre (WHOCC) for Reference and Research on Influenza, AAHL and observer members from private pathology, the Australian Federal Police and two New Zealand laboratories.

The requirements for medical testing accreditation in Australia are established by the National Pathology Accreditation Advisory Council (NPAAC). Accreditation is facilitated through a joint scheme managed by the National Association of Testing Authorities, Australia (NATA) and the Royal College of Pathologists of Australasia, with reference to the requirements outlined in the various NPAAC guidance documents.

There are 37 organism-specific reference laboratories in Australia, made up of 15 WHO Regional Reference Laboratories, Supranational Reference Laboratories and laboratory Collaborating Centres. Nine laboratories have formal Australian Government designation as reference laboratories.

Although there is no national programme for Point of Care Testing (PoCT) implementation in Australia, some states have started to integrate PoCT into their health services programmes. For example, New South Wales Health Pathology, the publicly funded pathology service in that state, has recently expanded point-of-care diagnostics to some regional laboratories. Also, South Australia Pathology has PoCT for influenza in a few metropolitan hospitals using GeneXpert, and two sites are now trialling the use of HIV PoCT.

State and territory governments are responsible for animal health services, including disease surveillance, investigation and diagnostic services, and reporting of diseases within their respective jurisdictions. Each jurisdiction has regular and emergency communication arrangements with animal health laboratories and epidemiologists.

Jurisdictional representatives, public health stakeholders, and representatives from AAHL, the Australian Government DAWR, and the DoH sit on committees such as the CDNA and PHLN. Reports of human and relevant animal health events can be shared at these forums.

Standard operating procedures are in place for specimen collection and handling. The packaging and transport of specimens is governed by the NPAAC document Requirements for the Packaging and Transport of Pathology Specimens and Associated Materials, which are consistent with International Air Transport Association requirements.

Transport of specimens from remote and regional sites can be challenging, with the delay from collection to registration at the initial testing laboratory at times exceeding 24 hours. However, laboratories or jurisdictions are responsible for arranging courier contracts to meet their individual requirements. Additional challenges in the veterinary sector stem from the fact that there is no mechanism for covering the cost of sample transport and analysis when the testing would be performed due to public health rather than clinical indications.

The status of Approved Pathology Provider requires a current NATA assessment report stating that it has been established, with a high level of confidence, that the pathology services provided at the premises meet relevant standards. NATA is the national body in charge of laboratory licensing, inspection and certification.

Medical laboratory accreditation is conducted through a joint programme between NATA and the Royal College of Pathologists of Australasia, which adheres to AS ISO 15189. To maintain accreditation, laboratories are subject to on-site inspections. The NATA assessment cycle for medical testing facilities is four years. This includes a surveillance visit at two years and a reassessment at four years. Online surveillance processes also occur at one year and three years. Loss of NATA accreditation leads to the loss of funding through the MBS.

Following NATA assessment, laboratories may be provided with a list of corrective actions. Laboratories must demonstrate that they have actioned these items within a certain time. These items are followed up at the next assessment, and accreditation may be suspended or withdrawn if laboratories are not able to demonstrate compliance.

Recommendations for priority actions

- Consider developing a OneHealth National Strategy to guide the public health laboratory testing and disease surveillance, engaging the veterinary livestock, zoonosis and food safety on all jurisdictional levels.
- Develop a strategy for the systematic use of full genome microbial data for national disease surveillance.
- Consider developing mechanisms to support transport of veterinary samples for public health purposes.

Indicators and scores

D.1.1 Laboratory testing for detection of priority diseases – Score 5

Strengths/best practices

- Excellent public health laboratory capacity and capability.
- Access across all states and territories including remote and regional areas.
- Well networked through the PHLN and well connected into national preparedness and response.
- Contributes to regional and international needs.

Areas that need strengthening/challenges

- There is a need for a national framework to guide optimal public health laboratory services.
- Long term financial sustainability of public health laboratory services (versus diagnostic).
- Integration of laboratory testing data with epidemiological data particularly in context of whole genome sequencing.

D.1.2 Specimen referral and transport system – Score 5

Strengths/best practices

- Comprehensive system of referral and transport of samples across all levels and throughout the country.

Areas that need strengthening/challenges

- For veterinary samples, a system of covering costs of samples collected for public health purposes is lacking.

D.1.3 Effective modern point-of-care and laboratory-based diagnostics – Score 5

Strengths/best practices

- Methods for direct detection using modern amplification-based methods are in wide use.
- Some jurisdictions have started to take into use PoCT.
- In-vitro Diagnostics (IVDs) are regulated under the *Therapeutic Goods Act 1989*.

Areas that need strengthening/challenges

- A strategic framework for PoCT use is missing.

D.1.4 Laboratory quality system – Score 5

Strengths/best practices

- A comprehensive laboratory accreditation and quality management system including external quality assessment programmes is in place throughout the different levels of clinical and public health microbiological laboratories.
- Similar parallel systems are in place for the veterinary laboratory sector.

Areas that need strengthening/challenges

- None.

Real-time surveillance

Introduction

The purpose of real-time surveillance is to advance the safety, security and resilience of the nation by leading an integrated biosurveillance effort that facilitates early warning and situational awareness of biological events.

Target

Strengthened foundational indicator- and event-based surveillance systems that are able to detect events of significance for public health, animal health and health security; improved communication and collaboration across sectors and between sub-national, national and international levels of authority regarding surveillance of events of public health significance; improved country and intermediate level regional capacity to analyse and link data from and between strengthened, real-time surveillance systems, including interoperable, interconnected electronic reporting systems. This would include epidemiologic, clinical, laboratory, environmental testing, product safety and quality and bioinformatics data; and advancement in fulfilling the core capacity requirements for surveillance in accordance with the IHR and OIE standards.

Australia level of capabilities

Australia has lists of priority diseases, conditions and case definitions for both humans (the National Notifiable Disease List (NNDL) under the *National Health Security Act 2007*) and animals (the National List of Notifiable Diseases of Terrestrial Animals). During an emergency, a mechanism exists for diseases to be temporarily added to the NNDL.

Diseases and conditions under the NNDL are coordinated by the National Notifiable Diseases Surveillance System (NNDSS) managed by the OHP in the DoH. Data quality and completeness are monitored by OHP and the National Surveillance Committee. State and territory governments collect data on human disease notifiable conditions and communicable diseases diagnosed in Australia under their public health legislation, and transmit computerised, de-identified unit records of diseases/conditions under the NNDL daily to the NNDSS. States and territories also provide and share information through fortnightly meetings and ad-hoc communication of the CDNA (and AHPPC if required).

Public health and clinical staff receive on-the-job training regarding notification procedures, depending on their jurisdiction and organisation. Information is also usually provided during undergraduate and postgraduate courses. At both national and jurisdictional levels, epidemiologists and trained staff regularly review and analyse the notifiable diseases data. The majority of notifiable diseases rely on laboratory confirmation (e.g. influenza). Nationally, data on overall laboratory testing are not available. In some states and territories, data on laboratory testing are available. Laboratory testing data would be useful in interpreting notification data to determine whether changes are a result of a change in testing practices or a true reflection of a change in disease.

At the national level, OHP is conducting event-based surveillance through formal and informal channels. At the local level, some jurisdictions require notification upon suspicion of disease with the timing of the notification dependent on the severity and potential consequences of the disease. Furthermore, jurisdictions have informal channels to collect information about events from media, health care workers and members of the public.

Australia has a number of national syndromic surveillance systems including real-time surveillance for influenza-like illness (ILI) through sentinel general practices, clinical and virological surveillance of cases of acute flaccid paralysis and gastroenteritis surveillance through OzFoodNet. Some jurisdictions also have jurisdictional-level syndromic surveillance systems, including the NSW Public Health Rapid, Emergency, Disease and Syndromic Surveillance system; the Western Australian surveillance for ILI, gastroenteritis and varicella/shingles; and the Victorian surveillance for ILI.

Recommendations for priority actions

- Establish an interoperable, interconnected electronic disease surveillance system for both human and animal sectors, coordinated at the national level and incorporating an outbreak management system, to ensure a consistent platform across and within jurisdictions.
- Enhance consistent collection and analysis of laboratory data by establishing or strengthening mechanisms to improve quality of denominator data and share data on overall laboratory testing (where relevant) at national, state and territory level.
- Promote innovative surveillance methods, including whole genome sequencing.

Indicators and scores

D.2.1 Indicator- and event-based surveillance systems – Score 5

Strengths/best practices

- Flexible and responsive surveillance systems exist for collating and reporting nationally notifiable diseases/conditions in both humans and animals.
- Event-based surveillance (EBS) is well-established at the national and jurisdictional level using official and unofficial channels.
- Competent public health laboratory networks both for human and animal sectors to conduct indicator-based surveillance are in place.
- Australia has and continues to play an important role in strengthening surveillance capacity in other Member States.
- Australia has been providing standardized surveillance data to WHO and OIE on an ad-hoc and regular basis for more than 5 years.

Areas that need strengthening/challenges

- None.

D.2.2 Interoperable, interconnected, electronic real-time reporting system – Score 3

Strengths/best practices

- Computerised, de-identified unit records of human health disease notifications are received by NNDSS from state or territory health authorities daily in a near real-time manner.
- Animal health notifiable diseases are reported to agricultural authorities through the Emergency Animal Disease Watch Hotline, and data are collated in the National Animal Health Information System.

Areas that need strengthening/challenges

- The human health and animal health sectors have independent, comprehensive and electronic surveillance systems, however, there is a need to establish mechanisms to enhance the interoperability of data between human and animal sectors.
- There is a need for a national interoperable surveillance system including an outbreak management system.

D.2.3 Integration and analysis of surveillance data – Score 5

Strengths/best practices

- A highly skilled workforce exists and there is a nationally consistent approach to data collection.
- Strong and collaborative mechanisms are in place to assure data quality and national consistency.

Areas that need strengthening/challenges

- There is a need to obtain denominator data from laboratories to determine a more accurate estimation of disease burden.

D.2.4 Syndromic surveillance systems – Score 5

Strengths/best practices

- Australia has syndromic surveillance systems both at the national and state and territory level to cover more than three syndromes of public health importance.
- Australia is contributing to strengthening syndromic surveillance systems internationally.

Areas that need strengthening/challenges

- None.

Reporting

Introduction

Health threats at the human–animal–ecosystem interface have increased over the past decades, as pathogens continue to evolve and adapt to new hosts and environments, imposing a burden on human and animal health systems. Collaborative multidisciplinary reporting on the health of humans, animals and ecosystems reduces the risk of diseases at the interfaces between them.

Target

Timely and accurate disease reporting according to WHO requirements and consistent coordination with FAO and OIE.

Australia level of capabilities

In Australia, the designation and function of the IHR NFP are specified in the *National Health Security Act 2007*. The IHR NFP function is delegated to the Assistant Secretary, Health Emergency Management Branch, OHP, which is supported by the NIR at the DoH. The functions of the IHR NFP include liaising with states and territories, and reporting a potential PHEIC to WHO which are clearly incorporated in the *National Health Security Act 2007*.

Under the National Health Security Agreement issued in 2008, the Australian Government and states and territories exchange information to inform timely decision-making and to support a coordinated national response to public health emergencies. Information on notifiable diseases and foodborne diseases from various surveillance systems is monitored by the NIR 24 hours a day, seven days a week. Internal SOPs are in place for approving and reporting a PHEIC to WHO.

Australia's CVO, from the DAWR, is designated as the OIE National Delegate. The OIE National Delegate has capacities and procedures in place to rapidly report listed animal diseases to the OIE. This has been demonstrated in previous reports through the World Animal Health Information System of the OIE. Zoonotic diseases information is shared routinely and on ad-hoc basis between DoH and DAWR through established mechanisms such as the CDNA, DAWR/DoH Zoonoses Group and the Consultative Committee on Emergency Animal Disease.

The NIR train their Watch Officers and Duty Officers through on-the-job training, WHO online outbreak training courses, and exercise programmes on IHR risk assessment and notification requirements. The OIE delegate and dedicated staff in DAWR participate in regular training seminars and exercises organized by the OIE.

The national legislative framework, surveillance systems, and cross-sectoral information sharing mechanisms allow Australia to identify and report a PHEIC promptly. The efficient application of the IHR (2005) decision instrument (Annex 2) by the DoH for decision-making and reporting of PHEICs was also tested and proved by Australia's participation the WPRO IHR Exercise Crystals.

Recommendations for priority actions

Although Australia has well-established capacity for reporting a PHEIC to WHO, several priority actions were identified during the evaluation:

- Strengthen communication between the IHR NFP and the OIE National Delegate, chemical sector and radiation sector, among others, through a formalized mechanism on potential public health risks reporting and information sharing.
- Improve understanding of international obligations to meet WHO and OIE requirements on IHR events and animal diseases notification among national, state and local stakeholders through multisectoral discussions.
- Enhance the multisectoral joint assessment among agencies on PHEIC notifications to WHO and animal disease notifications to OIE.

Indicators and scores

D.3.1 System for efficient reporting to FAO, OIE and WHO – Score 5

Strengths/best practices

- Australia has a firm legislative basis to support the implementation of IHR (2005), as stipulated in the *National Health Security Act 2007* and National Health Security Agreement. The IHR NFP has been designated and operational since 2007.
- Australia has comprehensive surveillance systems to collate information for timely identification of potential PHEICs. The information is monitored by the NIR 24 hours a day, seven days a week.
- Human and animal diseases of important significance are immediately reported internationally, as required, to WHO, OIE and FAO.
- DoH and DAWR have established mechanisms to exchange information on zoonoses.

Areas that need strengthening/challenges

- The collaboration between IHR NFP and relevant departments regarding assessing and reporting of chemical and radiological events need to be strengthened.

D.3.2 Reporting network and protocols in country – Score 4

Strengths/best practices

- Australia has demonstrated efficient IHR NFP function in the simulation exercises organized by WPRO, specifically on IHR notification and reporting.
- Watch Officers and Duty Officers in the NIR are trained on reporting of a potential PHEIC through on-the-job training, WHO online outbreaks training courses, and exercise programmes.
- Dedicated staff are accessible at all times to monitor and report a potential public health emergency of international concern and national concern.

Areas that need strengthening/challenges

- Formal documentation/official procedures for early information sharing and joint risk assessments in public health emergencies could be strengthened between IHR NFP, OIE National Delegate and the INFOSAN Emergency Contact Point.

Workforce development

Introduction

Workforce development is important in order to develop a sustainable public health system over time by developing and maintaining a highly qualified public health workforce with appropriate technical training, scientific skills and subject-matter expertise.

Target

States Parties with skilled and competent health personnel for sustainable and functional public health surveillance and response at all levels of the health system and the effective implementation of the IHR (2005).

Australia level of capabilities

Australia has a multidisciplinary public health workforce at all levels of government, including epidemiologists, medical and nursing professionals, public health physicians, medical laboratory scientists, public health officers, food safety officers and environmental health officers. This workforce works closely with health protection policy officers and media units to collectively and effectively respond to public health events.

Australia has a strong animal health and veterinary workforce, with 11,500 veterinarians in the country.

There is a comprehensive training and accreditation system for most disciplines within the public health workforce including for doctors, nurses and veterinarians.

Australian's Field Epidemiology Training Programme (the MAE) trains approximately 15 persons per year at the ANU and there have been more than 200 graduates since its establishment in 1991. In addition to the MAE, seven other universities in Australia offer postgraduate coursework-based epidemiology training.

New South Wales runs a workplace-based Public Health Training Program, which trains approximately 35 to 40 persons per year on public health (including policy), and a Biostatistics Training Program, which trains 15 to 20 persons per year on epidemiology and biostatistics.

Recommendations for priority actions

- Use existing data sources, including relevant accreditation schemes, to define the public health workforce in order to conduct forward planning, recruitment of appropriate categories of staff (including toxicology and radiation specialists) and development of future credentialing schemes.
- Work with states and territories to ensure sustainable mechanisms for epidemiologists and other public health professionals at state, territory and local level.
- Develop a long-term strategy that uses current and new channels to increase the international experience of the public health workforce.

Indicators and scores

D.4.1 Human resources available to implement IHR core capacity requirements – Score 5

Strengths/best practices

- Trained professionals are available at the national, jurisdictional and local levels to identify, prevent and minimize public health risks.
- States and territories work collaboratively to manage cross-border events and, if required, provide surge capacity to neighbouring states and territories.
- Multidisciplinary health professionals from states and territories, as part of national coordination arrangements, form the Australian Medical Assistance Team (AUSMAT) which can be deployed domestically or internationally in response to a disaster or public health emergency.
- The human health and animal health workforce have surge capacity to respond rapidly to events onshore and overseas.
- Regular exercises are conducted to test response capacity.

Areas that need strengthening/challenges

- To fully meet the capacity requirements of D.4.1 score 5, capacities on receiving international personnel into Australia should be strengthened (see Respond indicator 4.2).
- Although public health physicians are trained to a high standard by the Royal Australasian College of Physicians and must meet annual continuing education requirements, a national credentialing system for the public health workforce could ensure a consistent standard.
- Although Australians are deployed from the ARM network through the Global Outbreak Alert and Response Network regularly, outside of the network, public health personnel, including epidemiologists, have limited exposure to emerging and re-emerging infectious diseases, especially in the international context.

D.4.2 FETP or other applied epidemiology training programme in place – Score 5

Strengths/best practices

- The MAE and NSW Public Health Training Programmes recruit a wide range of students, including medical doctors, veterinarians, microbiologists, social scientists and nurses. Both programmes actively seek out participation of Aboriginal and Torres Strait Islander people.
- MAE alumni have established a database of trained professionals for field deployment – the ARM.
- The MAE is highly regarded and regularly used in public health emergencies. The partnership between government and an academic university setting is a time-tested model.
- Universities in Australia provide high-quality training on epidemiology and other disciplines that is internationally regarded.

Areas that need strengthening/challenges

- There is a need for public health personnel to have more opportunities in the international setting.

D.4.3 Workforce strategy – Score 4

Strengths/best practices

- Australia (through the AHPPC) closely monitors the supply and distribution of its public health, epidemiology and emergency response workforce. Workforce supply is tested in regular exercises.
- The Health Workforce Division within DoH has an ongoing programme of modelling and monitoring of the medical workforce supply and demand in all areas. An Australian Government Health Workforce Strategy is currently being prepared, but it will not identify public health and its related workforce as an area that needs attention.

Areas that need strengthening/challenges

- Forward looking, it is anticipated that there will be shortages of experts in specialized areas (including radiation and toxicology specialists and clinical virologists). Moreover, identifying surge capacity in these niche areas is likely to be challenging during an emergency.

RESPOND

Preparedness

Introduction

Preparedness includes the development and maintenance of national, intermediate and community/primary response level public health emergency response plans for relevant biological, chemical, radiological and nuclear hazards. Other components of preparedness include mapping of potential hazards, the identification and maintenances of available resources, including national stockpiles and the capacity to support operations at the intermediate and community/primary response levels during a public health emergency.

Target

Development and maintenance of national, intermediate (district) and local/primary level public health emergency response plans for relevant biological, chemical, radiological and nuclear hazards. This covers mapping of potential hazards, identification and maintenance of available resources, including national stockpiles and the capacity to support operations at the intermediate and local/primary levels during a public health emergency.

Australia level of capabilities

Australia has a set of well-established public health emergency preparedness and response plans at the national, jurisdictional and local government levels to prepare for and respond to emergencies from multiple hazards.

The AGCMF sets out the principles and responsibilities of agencies in managing domestic and international crises that require Australian Government assistance or coordination. In 2011, the AHPPC issued the NatHealth Arrangements to facilitate the DoH meeting its obligations under the AGCMF. The NatHealth Arrangements is Australia's highest-level health sector emergency plan. Using a multi-hazard approach, it sets out how different levels of government work collectively to manage health emergencies. Several sub-plans regarding mass casualty incidents, accidental and deliberate release events (including anthrax, chemical and radiological events), and communicable disease events are in place under the NatHealth Arrangements, most of which have been activated, reviewed or updated. The Australian Health Management Plan for Pandemic Influenza (AHMPPI) has been in place since 1999 and has often been used as a model for communicable disease management.

States and territories also have established jurisdictional health emergency and hazard-specific plans to support the national plans. Disease-specific plans are frequently used by jurisdictional departments of health in responding to communicable disease events within their jurisdictions. Simulation exercises have been conducted regularly within DoH to review and test the national public health emergency preparedness and response plans.

Australia has assessed and identified key communicable diseases of public health importance, diseases that pose biosecurity risks, and biological agents and toxins that represent national security threats. Ongoing mechanisms to rapidly assess emerging risks and monitor resources needed to contain the risks are in place. However, an aggregated and regularly updated national profile on public health risks and resources for all IHR-relevant hazards are absent.

The National Medical Stockpile (NMS) is maintained and coordinated by DoH. The stockpile contains antivirals, antibiotics, chemical, biological and radio-nuclear antidotes, personal protective equipment and other supplies. States and territories are maintaining jurisdictional stockpiles to support response within their respective jurisdictions.

Australia has established mechanisms and agreements to rapidly share resources with other Member States when a request arises.

Recommendations for priority actions

- Collate and regularly update the national public health risk profile to include both infectious hazards and other IHR-relevant hazards built on the existing risk assessment on communicable diseases.
- Include Rapid Response Teams and stockpiles into resource mapping to relatively and rapidly address the gaps identified at national, state and territory levels based on risk assessment of all IHR relevant hazards.
- Ensure public health emergency response plans at multiple levels and multiple sectors are linked appropriately and efficiently to facilitate a coordinated response across the country and across the agencies.

Indicators and scores

R.1.1 National multi-hazard public health emergency preparedness and response plan developed and implemented – Score 5

Strengths/best practices

- Australia has established an elaborate hierarchy of public health emergency preparedness and response plans at different government levels for all IHR-relevant hazards.
- Australia's health emergency management plans use existing systems and governance mechanisms as the basis of response which ensures familiarity and boosts the confidence of responders. The flexibility of existing plans also allows them to be used for unexpected/unusual events.
- A number of table-top exercises and functional exercises have been conducted by the Australian government to review and test the response plans on pandemic influenza, mass casualty incidents, chemical and radiological events and communicable disease incidents.

Areas that need strengthening/challenges

- The involvement of DoH in the development process of public health emergency response plans at the jurisdictional level could be strengthened for closer linkages between the national plans and jurisdictional plans.
- Innovative approaches to be considered by the Australian Government and state and territory governments to strengthen the scaling up capacities to meet surge needs during emergencies.

R.1.2 Priority public health risks and resources mapped and utilized – Score 3

Strengths/best practices

- Australia has strong committee structures to involve multidisciplinary expertise and multijurisdictional capacities in the process of risk assessment on public health emergencies.
- A NMS Deployment Plan for the management and distribution of resources when responding to priority risks and emergencies is in place and exercised.
- States and territories have a wide range of health resources, which are used regularly to manage ongoing health care and specific incidents within their jurisdictions.

Areas that need strengthening/challenges

- The national profile on public health risks and resources for all IHR-relevant hazards is yet to be aggregated and regularly updated.
- Risk assessment and resource mapping outcomes are to be shared with wider range of partners and stakeholders at different levels.

Emergency response operations

Introduction

A public health emergency operations centre is a central location for coordinating operational information and resources for strategic management of public health emergencies and emergency exercises. Emergency operations centres provide communication and information tools and services, and a management system during a response to an emergency or emergency exercise. They also provide other essential functions to support decision-making and implementation, coordination and collaboration.

Target

Country with public health emergency operations centre (EOC) functioning according to minimum common standards; maintaining trained, functioning, multisectoral rapid response teams and "real-time" biosurveillance laboratory networks and information systems; as well as trained EOC staff capable of activating a coordinated emergency response within 120 minutes of the identification of a public health emergency.

Australia level of capabilities

The DoH NIR serves as the national Public Health Emergency Operations Centre. The NIR is responsible for disseminating information and supporting coordination of resources between DoH, other Australian Government departments, state and territory governments, and WHO, as required, during a national health emergency. As a best practice, the NIR operates a dedicated hotline and email address, monitors information flows 24 hours a day, seven days a week, has dedicated business continuity resources and systems available, and supports Australia's IHR NFP responsibilities. During emergencies, the NIR accommodates liaison officers from other agencies and national partners, ensuring a multidisciplinary response. If required, the NIR can also provide liaison officers to be located within the EOCs of other agencies.

The NIR is used as the focal point for emergency meetings of the AHPPC and its standing committees. Decision-making during a health emergency of national significance occurs through the AHPPC, chaired by the CMO. The coordination of national resources required to respond to an emergency is facilitated through meetings of the AHPPC. The AHPPC has representation from all jurisdictions, several Australian Government agencies and independent experts. In addition to facilitating coordination between members, the AHPPC, through its Chair, also provides information to the Australian Government Crisis Committee (AGCC) when needed. The NIR implements relevant national decisions made by the AHPPC. When a whole-of-government response is required, Australian Government agencies coordinate their response activities through the AGCC (or, for overseas emergencies, through an Inter-Departmental Emergency Task Force). The AGCC then coordinates with state and territory governments, by expanding its membership to include state and territory representatives and becoming the National Crisis Committee.

State and territory governments have primary responsibility for the protection of life, property and the environment in their jurisdictions. States and territories implement AHPPC decisions at a jurisdictional level and control most prevention, preparedness, response, and recovery functions. Each jurisdiction has emergency response plans in place and a dedicated area of government to implement these. To support this, there are established high-level committees that provide direction to government, such as the State Emergency Management Committee. Each state and territory has a state coordination centre to assist with coordination and management and jurisdictional governments are responsible for liaising with, and supporting local government emergency response activities as well as disseminating public health information.

State and territory health departments have their own emergency plans, designed to integrate with the overall jurisdictional emergency plan. They also have operations centres that work with their respective state coordination centres, and dedicated staff with responsibilities related to emergency response. Public health is an integral part of health emergency response at the state and territory level.

At the local level, shires, towns or city councils fund their own community-based, volunteer-staffed, State Emergency Service (SES) units. The SES is managed by paid, qualified emergency personnel, and its volunteer members are equipped, uniformed, trained and led to a common standard recommended by Emergency Management Australia. These groups maintain interoperability with each other and interstate SES groups, and work in conjunction with ambulance, fire services, police and potentially the Australian Defence Force.

Recommendations for priority actions

- Enhance the existing public health exercise programme to address all IHR-relevant hazards and to integrate multisectoral and multijurisdictional elements.
- Develop policies and procedures to ensure the timely release of surge staff during times of response.
- Assess the feasibility of using the Incident Management System for daily use across the preparedness cycle.

Indicators and scores

R.2.1 Capacity to activate emergency operations – Score 4

Strengths/best practices

- The NIR is monitored 24 hours a day, seven days a week by a watch officer (business hours) and a duty officer (after hours). The NIR facility coordinates resources and disseminates information during a national emergency.
- NIR Watch Officers and Duty Officers are trained to manage the functions of the IHR NFP including responding to and liaising with jurisdictions regarding information on potential PHEICs and of national concern; and responding to WHO and jurisdictions to implement the IHR (2005). In addition, the Doctor on Duty is a valuable resource that provides and confirms clinical advice to the IHR NFP.
- The NIR workforce comprises core staff, who work full time in health emergency management or related areas such as surveillance, voluntary staff from OHP who may regularly act as Watch Officers and Duty Officers; and voluntary surge staff from across the department. NIR staff are recruited from across DoH with an NIR induction compulsory for all staff, including an orientation to the facility and to the Australasian Inter-Service Incident Management System (AIIMS). All NIR staff are also invited to participate in regular operational exercises that help to develop skills and an understanding of NIR policies and processes.
- The NIR uses the AIIMS structure to help define roles and responsibilities in an incident. AIIMS is fully concordant with the guidance provided in WHO's Framework for a Public Health Emergency Operations Centre.
- NIR SOPs are continuously reviewed to meet response operations requirements and standard business practices.

Areas that need strengthening/challenges

- In the event of an incident, core NIR staff are supplemented by voluntary staff from OHP. When additional personnel are needed, the broader DoH NIR surge workforce members are approached and asked to participate in the response operations. Their ability to participate, as well as to get trained appropriately ahead of time, is dependent on being released from their current work responsibilities in a timely manner.

R.2.2 EOC operating procedures and plans – Score 4

Strengths/best practices

- The NIR has a robust suite of SOPs covering emergency operations, Watch/Duty Officer duties, the incident management system, and routine activities. These SOPs are available on the NIR's web-based incident management system and in DoH's electronic document management system, so all staff can readily access them. In addition to these SOPs, an index of health emergency policies and procedures relevant to emergency response is maintained by NIR staff and is frequently reviewed. This is also supported by response action checklists that have been developed to help support the NIR staff with decision-making during a response.
- Health emergency response plans contain roles and responsibilities of key personnel and committees responsible for decision-making. Roles and responsibilities around decision-making vary depending on the emergency or type of incident. Depending on the situation, the decision-maker may be the Prime Minister, the Minister for Health, or the CMO. In the event of a national public health emergency, the Assistant Secretary Health Emergency Management Branch chairs the Incident Management Team and acts as the incident manager, providing situation reports to senior executives for decision making.
- Depending on the scale of the incident, incident reports may be disseminated as often as twice a day, to once a week for lower-scale emergencies.

Areas that need strengthening/challenges

- Response plans currently do not address scaled levels of response or the resource requirements associated with those scaled levels.
- Currently, the DoH's risk assessment capabilities are focused on disease and epidemiology. An expansion of risk assessment to address other risk elements, such as risk perception, would ensure that a broader risk framework is incorporated into decision-making.

R.2.3 Emergency operations programme – Score 5

Strengths/best practices

- The NIR routinely participates in a number of both discussion-based and operations-based exercises annually. These exercises include both domestic and WHO-led exercises, and have demonstrated the NIR's ability to activate within two hours of the determination of a public health emergency.
- The Health Emergency Management Branch develops an annual exercise schedule that encompasses a number of operational and policy/planning related topics. There is broad participation in these exercises, ensuring that the NIR core and surge workforce is provided with training opportunities throughout the year.
- After all exercises and responses, AARs are held. Lessons learnt are captured in a register which is maintained by the NIR, tracking action items that have been identified to further enhance the emergency management program's operations.

Areas that need strengthening/challenges

- Although many exercises currently conducted are multi-sectoral in nature, the current exercise programme does not routinely integrate multiple levels of government simultaneously in the same exercise, nor does it routinely address all IHR-relevant hazards.

R.2.4 Case management procedures implemented for IHR relevant hazards – Score 5

Strengths/best practices

- The Series of National Guidelines (SoNGs) provide guidance on how to respond to a notifiable disease event. The SoNGs have been developed in consultation with the Communicable Diseases Network Australia and endorsed by the AHPPC. SoNGs provide nationally consistent advice and guidance to public health units when they respond to a notifiable disease event. Whenever possible, national SoNGs are adopted as state and territory guidelines, however jurisdictions may also develop local plans and SOPs to consider local operational needs or other concerns.
- At Points of Entry (PoEs), the Traveller with Illness Checklist is used to screen travellers at risk of having a listed human disease (LHD) under the *Biosecurity Act 2015* (Biosecurity Act). Travellers assessed as potentially infectious are managed and transported under the advice of a jurisdictional Chief Human Biosecurity Officer or a Human Biosecurity Officer.
- Human remains that may carry infectious diseases are managed and transported under advice from a Chief Human Biosecurity Officer or a Human Biosecurity Officer using written directions (under the Biosecurity Act). Potentially infectious human remains not carrying a risk of an LHD are cleared for entry into Australia, and are expected to be managed and transported as per state and territory legislation, policies and guidelines. Human remains with unknown LHD risk are assessed by a Human Biosecurity Officer for LHD risk and, if absent, the remains are granted permission for entry; if an LHD risk is present, entry may be granted, but advice and written directions for the management and handling of the remains may be required from the Human Biosecurity Officer. Management of potentially infectious human remains at the jurisdiction and local level is managed by state and territory health authorities.
- States and territories have jurisdictional plans and SOPs to guide the management and transport of patients during disease outbreaks and other emergency situations. All states have urgent and non-urgent ambulance transport resources with plans in place to surge for any emergency. A smaller number of non-government resources can be used in the event of a mass casualty situation. The AUSTRAUMAPLAN, as well as bilateral agreements between states and territories, address both road and aeromedical transport, allowing for a wider distribution of patients in catastrophic events. All transport services have protocols and procedures for managing infectious patients.

Areas that need strengthening/challenges

- Although processes are in place for case management across multiple public health threats, planning processes have not fully clarified the resource needs (including staffing required) for execution of these contingency plans.

Linking public health and security authorities

Introduction

Public health emergencies pose special challenges for law enforcement, whether the threat is manmade (e.g. the anthrax terrorist attacks) or naturally occurring (e.g. flu pandemics). In a public health emergency, law enforcement will need to quickly coordinate its response with public health and medical officials.

Target

Country conducts a rapid, multisectoral response in case of a biological event of suspected or confirmed deliberate origin, including the capacity to link public health and law enforcement, and to provide and/or request effective and timely international assistance, such as to investigate alleged use events.

Australia level of capabilities

Australia has a multisectoral approach to biological threats, with a range of plans, agreements and MoUs between health and security authorities at the national level. Mechanisms such as the NatHealth Arrangements; National Counter-Terrorism Plan; and AGCMF give confidence that activities are well defined and integrated. The AGCMF articulates lead and support agencies for various hazards and provides the mechanism for cooperation and coordination of all-hazard responses across the Australian Government, states and territories.

Information sharing between public health and security authorities occurs at multiple levels. The AGCMF and NatHealth Arrangements outline how information will be shared between state and territory governments and the Australian Government during a biological emergency, particularly the National CDPLAN (National arrangements), CDPLAN (Health Sector arrangements) and the *Domestic Health Response Plan for Chemical, Biological, Radiological or Nuclear Incidents of National Consequence* (Health CBRN Plan) Plan.

The AHPPC and its standing committees provide a forum for health representatives from the Australian Government, state and territory governments, Defence and the Attorney-General's Department to collaborate on public health planning, preparedness, response and recovery. AHPPC meets regularly, can be called together within one hour, and can co-opt additional advice as required, for example on responses linked to the Biological and Toxins Weapons Convention.

The DoH, the DAWR, the Department of Immigration and Border Protection (DIBP), and other security agencies also meet regularly to facilitate information sharing. Daily hazard reports provided by the Australian Crisis Coordination Centre and the Department of Foreign Affairs and Trade include health specific content where necessary, and are circulated to all relevant Australian Government agencies, states and territories.

States and territories also have their own emergency response plans and networks, managed through state crisis centres or other arrangements. Many have assessed their local hazard priorities (with human disease frequently included) and exercise responding to such emergencies across health and security agencies. Lessons are shared between states and territories through the National Health Emergency Management Standing Committee (NHEMS).

Some administrative and legislative frameworks are in place for joint risk assessment during events of public health and security significance, for example the AGCMF mechanism and *National Health Security Act 2007*. MoUs also facilitate shared risk assessments, such as that between DoH and the Australia Federal Police (AFP) on the SSBA Regulatory Scheme. AHPPC allows for shared high-level health risk assessment between all levels of government to appropriately plan and coordinate health sector responses. Enhanced mechanisms for coordinating regular information sharing and joint risk assessments across health and security agencies at Australian Government, state and territory levels would be beneficial.

DoH and DAWR co-administer the new *Biosecurity Act 2015* which, supported by a MoU, provides most legislative and administrative arrangements for coordinating health and other emergency responses at PoEs. This includes designated officers with powers to control communicable diseases, such as detaining or quarantining people at home. In addition, each state and territory has Public Health Acts (or similar) that provide legislative powers, minimising public health risks in their jurisdictions.

Over the last twelve months, two cross-government exercises engaged both health and security authorities. An example involving AHPPC was Exercise Galaxy, a whole-of-government desktop exercise coordinated by the Australia-New Zealand Counter-Terrorism Committee in June 2017 based on four security incidents in Melbourne's central business district. Lessons from exercises and real events at the Australian Government level are consolidated into a 'corrective actions list'. Formal mechanisms for implementation of these actions should ideally be built.

Potential biological communicable disease events can be identified through national surveillance systems and public health laboratory testing. Core public health laboratories also have some capacity and capability to test for biological agents of security concern. DoH ensures response plans for key biological agents of security concern (anthrax, smallpox, abrin, ricin toxins) are maintained under the Health CBRN plan. Notification of deliberate events or intelligence may be provided by states and territories, the Australian Security and Intelligence Organisation, or the AFP. The National Central Bureau (hosted by AFP) maintains connections with Interpol.

In July 2017, the Prime Minister of Australia announced the establishment of a Home Affairs portfolio to link Australia's immigration, border protection, law enforcement, and domestic security agencies. This is anticipated to enhance integrated intelligence and domestic security arrangements, presenting a changing landscape of opportunities for improved linkages between public health and security authorities in Australia.

Recommendations for priority actions

- Develop and implement an annex under the MoU between DoH and DAWR to clearly articulate roles and responsibilities of agencies during times of escalated public health activity at points of entry, in consultation with Chief Human Biosecurity Officers from each state and territory.
- Establish clear mechanisms for coordinating regular information sharing and joint risk assessments across health and security agencies at the Australian Government, state and territory levels.
- Establish a joint exercise programme and joint training across health and security agencies, engaging all levels of government (including state and territory, and local government) and ensure lessons are shared with all parties and reflected in work programmes.

Indicators and scores

R.3.1 Public health and security authorities (e.g. law enforcement, border control, customs) linked during a suspect or confirmed biological event – Score 4

Strengths/best practices

- Australia has extensive plans and arrangements in place across health and security authorities at the Australian Government level, reinforced by formal agreements including legislation, multiple MoU, policies and procedures with relevant agencies.
- The AGCMF, NatHealth Arrangements and AHPPC all facilitate a level of information sharing, risk assessment, cooperation and coordination of responses to biological events across public health and security authorities of the Australian Government and state and territory governments.
- Daily hazard reports are provided by the Australian Crisis Coordination Centre and the Department of Foreign Affairs and Trade to all relevant Australian Government agencies, states and territories, including information on health hazards when relevant.
- Cross-government committees including public health and security authorities are established prior to mass gathering events (for example, the 2018 Commonwealth Games) to conduct joint threat/risk assessments and agree measures to minimise identified risks.

Areas that need strengthening/challenges

Australia has achieved the primary goal of implementing a multisectoral response to biological threats, with opportunities identified to strengthen linkages and capacity between health and security authorities further, including:

- Developing an exercise programme and joint training across public health and security authorities.
- Ensuring lessons from exercises and real events are consolidated into a 'corrective actions list' with a formal mechanism established for implementation of actions.
- Enhanced joint risk assessment and regular information sharing between health and security authorities, including a joint investigations curriculum.

Medical countermeasures and personnel deployment

Introduction

Medical countermeasures are vital to national security and protect nations from potentially catastrophic infectious disease threats. Investments in medical countermeasures create opportunities to improve overall public health. In addition, it is important to have trained personnel who can be deployed in the case of a public health emergency response.

Target

National framework for transferring (sending and receiving) medical countermeasures, and public health and medical personnel from international partners during public health emergencies.

Australia level of capabilities

Australia is geographically isolated and has limited onshore access to, and manufacturing capability for, specialist medical countermeasures required to respond to national public health emergencies. The NMS, managed by the DoH, contains a range of medical countermeasures and personal protective equipment to augment state and territory resources and is housed at various strategic locations to facilitate timely deployment. Australia has a national framework for the preparedness, deployment and post deployment activities of the AUSMAT and as such can be deployed in response to national or international disasters.

The Australian Government has an agreement with Australia's only onshore vaccine manufacturer Seqirus to manufacture candidate influenza vaccine (in bulk) to strains with pandemic potential and strain specific vaccine in a pandemic.

Australia maintains a national inventory management system for the NMS that is determined through ongoing consultation with state and territory governments and expert advice from the National Health Emergency Management Standing Committee (NHEMS), CDNA, National Medical Stockpile Advisory Group, and Australian Government intelligence and security agencies.

Additionally, states and territories have independent plans and procedures in place for the rapid distribution and transfer of medical countermeasures across various locations and centres in Australia, including rural and remote areas, during a public health emergency. In the event of a national crisis, the AGCC and/or the National Crisis Committee (NCC) are responsible for whole-of-government coordination.

In response to an international crisis requiring Australian Government assistance, response and recovery efforts are led by the Minister of Foreign Affairs. Australia's Inter-Departmental Emergency Task Force is the key whole-of-government body for managing a crisis that has affected, or threatens to affect, Australians or Australian interests overseas, and coordinates Australia's response to international humanitarian crises. Formation of an Inter-Departmental Emergency Task Force occurs as required.

Recommendations for priority actions

- Further develop, formalize and test arrangements and procedures to accept international health personnel into Australia during a disaster in a manner consistent with Australia's regulatory standards.
- Engage with relevant departments and stakeholders on guidance to confer liability protection in relation to the manufacture, testing, development, distribution, administration, and use of medical countermeasures during a response.
- Develop a policy defining parameters on how and when Australia would consider sharing medical countermeasures with other countries.
- Consider proactive engagement with the public to convey relevant information about medical countermeasures as a key component of preparedness.
- Consider developing a policy on engaging alternative sources for medical countermeasures from overseas manufacturers, along with support to local development of medical countermeasures.

Indicators and scores

R.4.1 System in place for sending and receiving medical countermeasures during a public health emergency – Score 4

Strengths/best practices

- Australia's onshore vaccine manufacturer has negotiated a Standard Material Transfer Agreement 2 under the Pandemic Influenza Preparedness Framework with WHO to ensure that a specified amount of pandemic influenza vaccine is provided to WHO as a contribution to a global pandemic response.
- In 2017, live deployment exercises were conducted by Australia that included a desktop deployment exercise and four live deployment exercises. Corrective actions based on weaknesses identified have been implemented in the critical areas of cold chain and timeliness along with the updating of operational plans.

Areas that need strengthening/challenges

- All medical countermeasures held in the NMS are manufactured overseas. Laboratory supplies and equipment are also produced offshore. Medical countermeasures cannot be procured 'just in time' within normal emergency (short) time frames because of manufacturing time lines, global market pressures and the complexity of the global supply chain.
- Although sharing of medical countermeasures has been done in the past with countries, no specific policy exists to the sharing of medical countermeasures with other countries.

R.4.2 System in place for sending and receiving health personnel during a public health emergency – Score 5

Strengths/best practices

- Australia has a national framework for the preparedness, deployment and post-deployment activities of AUSMAT.
- Australia signed up to the WHO Global Emergency Medical Teams (EMT) Initiative and AUSMAT attained verification as a Type 2 EMT in October 2016.
- AUSMAT is supported by a roster of state and territory health governments to support health emergencies domestically and internationally, as required and requested.

Areas that need strengthening/challenges

- Australia does not have an existing procedure in place to accept international clinical teams into Australia.

Risk communication

Introduction

Risk communications should be a multilevel and multifaceted process which aims at helping stakeholders define risks, identify hazards, assess vulnerabilities and promote community resilience, thereby promoting the capacity to cope with an unfolding public health emergency. An essential part of risk communication is the dissemination of information to the public about health risks and events, such as disease outbreaks. For any communication about risk caused by a specific event to be effective, the social, religious, cultural, political and economic aspects associated with the event should be taken into account, including the voice of the affected population.

Communications of this kind promote the establishment of appropriate prevention and control action through community-based interventions at individual, family and community levels. Disseminating the information through appropriate channels is essential. Communication partners and stakeholders in the country need to be identified, and functional coordination and communication mechanisms should be established. In addition, the timely release of information and transparency in decision-making are essential for building trust between authorities, populations and partners. Emergency communications plans should be tested and updated as needed.

Target

State Parties use multilevel and multifaceted risk communication capacity. Real-time exchange of information, advice and opinions between experts and officials or people who face a threat or hazard (health or economic or social wellbeing) to their survival, so that informed decisions can be made to mitigate the effects of the threat or hazard and protective and preventive action can be taken. This includes a mix of communication and engagement strategies, such as media and social media communications, mass awareness campaigns, health promotion, social mobilization, stakeholder engagement and community engagement.

Australia level of capabilities

Australia has comprehensive systems in place to support risk communication in emergencies. A series of plans developed in consultation with partners and stakeholders from other sectors outline common objectives, roles and responsibilities, and approaches for mounting coordinated and complementary risk communication responses to a range of hazards, including infectious disease outbreaks; chemical, biological, radiological and nuclear events; as well as natural and human-made disasters. These plans have been tested in emergencies and exercises and are updated with lessons learned from experience.

The risk communication function is supported by experienced staff in several communication disciplines, including media relations, social media, marketing, creative design and online communication. Surge resources are available to scale up in an emergency response from inside and outside Australian Government agencies. However, systems could be strengthened with a training programme that establishes common levels of understanding in the principles, best practices and practical risk communication skills, including community engagement, across Australian Government agencies. The communication function receives ongoing funding for staff and funding is available for emergencies.

Coordination is vital to ensure consistent and complimentary risk communication among sectors, partners and stakeholders, and this is especially important in a federated system in which Australian Government agencies and jurisdictions may have overlapping mandates. Australia has plans, standard operating procedures and mechanisms in place, including the National Health Emergency Media Response Network (NHEMRN), that help coordinate public communication and other risk communication activities among sectors, jurisdictions and stakeholders. While the NHEMRN convenes frequently in emergencies, regular meetings in normal times could strengthen preparedness.

Australia has a comprehensive system in place for communicating with the public in emergencies. The public seeks information from more sources than ever, which demands the use of diverse channels. Federal, state and territory governments communicate with the public in a range of different ways, including the traditional media, social media, online communication, phone hotlines, and the distribution of printed signs, pamphlets and other materials. Social media channels, including Facebook, Twitter, and YouTube, are used to share information in emergencies. Given how quickly social media communication is advancing, Australia would further strengthen its public communication by continuing to develop capacity in the strategic use of these channels in emergencies with clear protocols to guide coordination among sectors, jurisdictions and stakeholders.

Engaging communities as equal partners in risk communication during emergencies helps ensure those at risk receive the information they need in a manner that resonates and builds trust. Federal, state and territory governments engage communities on health issues. Communication campaigns are informed by community input collected through targeted surveys, focus groups and other methods. Communities provide feedback to the government through phone, email, social media and other channels. However, engagement plans, products and lessons learned are not consistently shared with other sectors, jurisdictions and stakeholders, which could inform partners in their risk communication planning during emergencies.

Real-time listening is essential for assessing the effectiveness of risk communication plans and messages as they are implemented, and for correcting errors and misconceptions among communities and the public. Governments monitor traditional media and social media during emergencies, and work to address errors and misconceptions. While communication is assessed in after-action reports and campaign evaluations, governments could better inform plans by evaluating how they use real-time listening in emergencies and how effective correcting misinformation is in quelling rumours and changing behaviour.

Recommendations for priority actions

- Implement a risk communication training programme for communications staff, emergency response employees, senior management decisions-makers and other relevant staff to establish a common understanding and expertise.
- Develop guidance for the strategic use of social media in emergencies that includes protocols for coordination among jurisdictions, sectors and stakeholders.
- Establish a mechanism that monitors community engagement activities across jurisdictions and shares lessons learned to inform risk communication planning and message development in emergencies.

Indicators and scores

R.5.1 Risk communication systems (plans, mechanisms, etc.) – Score 5

Strengths/best practices

- Risk communication is integrated into multiple communicable disease and emergency response plans.
- Experienced staff are in place with skills in various communication disciplines.
- There is ongoing funding for communications staff and additional resources available in emergencies.
- Systems and processes involve partners, sectors, jurisdictions, and national and international stakeholders.
- Systems are tested regularly in exercises and emergencies, and lessons learned are applied to strengthen capacity.

Areas that need strengthening/challenges

- No formal training programme is in place at national level for communicators, emergency response staff and senior management decision-makers.

R.5.2 Internal and partner communication and coordination – Score 5

Strengths/best practices

- Risk communication is integrated in the incident management system to inform decision-making and response.
- NHEMRN coordinates risk communication among sectors, jurisdictions and stakeholders, jointly developing and sharing communication plans and products.
- The Trusted Information Sharing Network coordinates information sharing and communication planning with the critical infrastructure sector.
- Coordination is tested regularly in exercises and emergencies, and lessons learned are applied to strengthen capacity.

Areas that need strengthening/challenges

- Regular NHEMRN meetings held in normal times could maintain partner relationships and strengthen preparedness.

R.5.3 Public communication – Score 4

Strengths/best practices

- There is a multitude of public communication channels used to reach audiences in emergencies, including traditional and social media, websites, public hotlines and printed materials.
- Trained spokespeople have been identified at different levels of government.
- Messages and materials can be translated into multiple languages to reach affected populations.
- Work is underway to modernize federal websites to make information more easily accessible to the public.
- Lessons learned in emergencies and exercises are shared across jurisdictions.

Areas that need strengthening/challenges

- There is a need for further development of social media capacity and clarification of coordination protocols for communication and engagement in emergencies.

R.5.4 Communication engagement with affected communities – Score 3

Strengths/best practices

- Communities are engaged in emergencies by all jurisdictions in a decentralized approach.
- Campaign-focussed research informs communication in emergencies, including approaches to reach vulnerable populations.
- Multiple channels are available to communities to provide feedback.

Areas that need strengthening/challenges

- Community engagement plans, products and lessons learned are not always shared among sectors and jurisdictions.

R.5.5 Dynamic listening and rumour management – Score 4

Strengths/best practices

- Traditional media and social media are monitored in emergencies to correct errors, address misconceptions and gauge opinion.
- Corrections to misinformation are shared with partners.

Areas that need strengthening/challenges

- There is a need for systematic evaluation of listening in emergencies to improve communication response, correct misinformation, quell rumours and/or change behaviour.

OTHER IHR-RELATED HAZARDS AND POINTS OF ENTRY

Points of entry

Introduction

All core capacities and potential hazards apply to "points of entry" and thus enable the effective application of health measures to prevent international spread of diseases. State Parties are required to maintain core capacities at designated international airports and ports (and where justified for public health reasons, a State Party may designate ground crossings), which will implement specific public health measures required to manage a variety of public health risks.

Target

States Parties designate and maintain core capacities at international airports and ports (and where justified for public health reasons, a State Party may designate ground crossings) that implement specific public health measures required to manage a variety of public health risks.

Australia level of capabilities

Australia's main piece of legislation covering biosecurity at the border is the *Biosecurity Act 2015*, which requires all aircraft and vessels to enter Australian territory at a designated FPoE. Ports are designated FPoEs when the Director of Biosecurity or the Director of Human Biosecurity is satisfied that a port meets all regulation requirements, and the level of biosecurity risk associated with operations at the port is acceptable.

In addition to being designated as FPoEs under the *Biosecurity Act 2015*, the 14 primary FPoEs in Australia are also designated as PoEs under the IHR after demonstrating that they meet the IHR Annex 1B core capacity requirements. National standards have been developed that include consideration of requirements to manage both biosecurity and human biosecurity risks, and incorporate relevant core capacities for PoEs from the IHR(2005).

Each PoE has DAWR and DIBP staff to operationalise Australian law and policies for biosecurity, customs and immigration. DAWR and state or territory health departments operationalise DoH's policies at PoEs because DoH does not have a physical PoE presence. Australia's designated airport and seaport PoEs are largely owned and operated by private corporations, which are required to comply with Australian legislation.

Referral systems are in place where DAWR, DoH and jurisdictional health services work together to ensure safe transfer of ill travellers to medical facilities. The NatHealth Arrangements, the *Biosecurity Act 2015* and guidelines published by CDNA guide these activities.

At international airports and seaports that are PoEs, DAWR Biosecurity Officers work with state and territory health governments, local governments and port authorities to ensure that these ports are rendered as unreceptive as possible to any vectors and reservoirs that may arrive, by removing or treating any possible breeding sites. Despite these measures and mandatory aircraft disinsection, there have been a small number of detections recorded.

Australia has evaluated the effectiveness of PoEs in responding to public health events in a number of simulation exercises, however these have mainly focused on communicable disease emergencies.

Recommendations for priority actions

- Develop an all-hazards multisectoral exercise programme for designated and non-designated PoEs, engaging states and territories and external stakeholders.
- Establish electronic systems for storing and transmitting information between all relevant stakeholders related to the assessment of ill travellers at the border and the provision of passenger information for contact tracing purposes.
- Develop and implement a sustainable mechanism of training for Biosecurity Officers on public health aspects of PoEs.
- In future reviews of national PoE standards, consider revising requirements for ill traveller assessment facilities, to include size of facility and further identified areas for appropriate management of public health risks.

Indicators and scores

PoE.1 Routine capacities established at points of entry – Score 5

Strengths/best practices

- Legislation, such as the *Biosecurity Act 2015* and plans such as the CDPLAN are available. These guide government responses to public health emergencies, including those at PoEs.
- Access to veterinary services is available at all designated PoEs, and the first phase of a single national holding site for animal quarantine, the Post Entry Quarantine facility, opened in 2015.
- There are Australian Government and state and territory legislation and guidelines which support inspection programmes to ensure safe environments and functioning facilities exist at PoEs.
- Vector control (including disinsection of aircraft and vessels) and inspection of all ships by trained Biosecurity Officers at PoEs prevent the introduction of and control the spread of diseases.

Areas that need strengthening/challenges

- Although staff working at PoE undergo an initial training, a sustainable systematic training programme should be established.
- Current information collection on ill travellers is paper-based. Electronic alternatives should be provided using an integrated information technology system, to improve storage, sharing and dissemination of traveller information between partners and key stakeholders.

PoE.2 Effective public health response at points of entry – Score 5

Strengths/best practices

- Australia has a range of biosecurity powers and measures that become available under its *Biosecurity Act 2015* to manage serious public health risks at PoEs.
- Onsite health interview rooms exist at all PoEs for isolation and assessment of ill travellers away from other travellers.
- Facilities for assessing and quarantining ill travellers, screening of animals and animal products, plants and plant products are available at PoEs.
- Referral systems are in place where Biosecurity Officers, and jurisdictional health services work together to ensure safe transfer of ill travellers to medical facilities. The NatHealth Arrangements, the *Biosecurity Act 2015* and guidelines published by the CDNA guide these activities.
- Australia has evaluated a range of emergency responses, and findings have been published and used to inform and update future plans.

Areas that need strengthening/challenges

- Work between the Australian Government and state and territory governments could be undertaken to ensure that health care workers are consistently asking people who are presenting unwell about their recent travel history.
- There is a need to ensure adequate facilities/space is available for the assessment and quarantine of ill travellers, and their contacts or fellow passengers.
- While simulation exercises are conducted at PoEs, multisector multiagency exercises should be developed and tested at PoEs for all IHR-related hazards.

Chemical events

Introduction

Timely detection and effective response of potential chemical risks and/or events require collaboration with other sectors responsible for chemical safety, industries, transportation and safe disposal. This would entail that State Parties need to have surveillance and response capacity to manage chemical risk or events and effective communication and collaboration among the sectors responsible for safety.

Target

States Parties with surveillance and response capacity for chemical risks or events. This requires effective communication and collaboration among the sectors responsible for chemical safety, industries, transportation and safe disposal.

Australia level of capabilities

Australia does not have a single body that manages all chemicals. Several agencies at the national, as well as state and territory levels, manage specific aspects of chemicals, depending on their remit. Policy for regulating chemicals is determined by ministerial councils. The Australian Government undertakes most hazard and risk assessments and implements international agreements, while state and territory governments focus on chemical risk management, including control of use and disposal.

Four chemical assessment and registration schemes operate in Australia, and complement each other, at the national level. Therapeutic goods are regulated by the TGA within the DoH. The use of chemicals in food and food additives is subject to standards set by FSANZ. Pesticides and veterinary medicines are regulated by the Australian Pesticides and Veterinary Medicines Authority (APVMA). Industrial chemicals are notified to, and assessed under, DoH's National Industrial Chemicals Notification and Assessment Scheme (NICNAS).

The Australian Government Department of Environment and Energy also has a role in ensuring chemicals are managed safely to protect the environment and human health, including environmental assessments of industrial chemicals for NICNAS and agricultural chemicals for the APVMA. The National Registration Scheme for Agricultural and Veterinary Chemicals is the regulatory framework for managing agricultural and veterinary (agvet) chemicals in Australia. The scheme is a partnership between the Australian Government and state and territory governments, with a shared division of responsibilities. The DAWR manages the legislation under which the scheme operates. The states and territories are responsible for regulating and managing the use of agvet chemical products after sale. The APVMA conducts safety assessments on all of the agvet chemical products it registers.

NICNAS is a statutory scheme, established by the *Industrial Chemicals (Notification and Assessment) Act 1989*, administered by the Office of Chemical Safety within DoH. The primary role of the NICNAS relates to risk assessments of industrial chemicals and making recommendations to risk management agencies to implement measures to enable safe use. It focuses on the industrial uses of chemicals (defined as any use other than therapeutic, food or agricultural use).

The Inventory Multi-tiered Assessment and Prioritisation framework accelerates the assessment of chemicals listed on the Australian Inventory of Chemical Substances (AICS). Approximately 40,000 chemicals are listed on the AICS. Chemicals listed on the AICS may be imported or manufactured in Australia without notification to NICNAS. NICNAS risk assessments, and any resulting recommendations for risk management controls, are provided to the relevant government risk management agency, which then determines the controls to enact and enforce. All risk assessments are published on the NICNAS website. More than 9,000 industrial chemicals have been subject to a risk assessment under NICNAS.

The AGCMF provides coordination for disasters, including chemical events. Intrajurisdictional coordination of Australian Government agencies is through the AGCC. Interjurisdictional coordination between the Australian Government and state and territory governments is through the NCC. Emergency Management Australia, within the Attorney-General's Department, is the Australian Government lead agency for disaster and emergency management, including chemical events, and uses well-defined crisis management plans and arrangements to ensure that the activities of relevant agencies are well integrated. The Health CBRN Plan provides an overarching view of what the health sector and supporting Australian Government agencies would be required to do. Management of such an incident requires a multiagency response, involving a combination of crisis and consequence management activities, implemented by a number of different agencies.

Australia has several chemical databases and registers. NICNAS maintains the AICS, which provides the identity information and regulatory obligations for chemicals that can be manufactured or imported without notifying NICNAS. Safe Work Australia manages the Hazardous Chemical Information System. The TGA also administers the Poisons standard, which is available online. Individual states and territories have access to a number of chemical databases which inform responses.

Recommendations for priority actions

- Develop a reporting schema for Poison Information Centres / Poison Treatment Centres to provide early warning of high-risk chemical exposures to the IHR NFP.
- Integrate all chemical monitoring and surveillance reporting from the different sectors into a national common operating picture of chemical exposures.
- Enhance mechanisms for responsible agencies to consistently apply chemical management standards and guidelines.

Indicators and scores

CE.1 Mechanisms established and functioning for detecting and responding to chemical events or emergencies – Score 5

Strengths/best practices

- NICNAS lists all industrial chemicals in Australia on the AICS database, and performs risk assessments.
- The National Registration Scheme for Agricultural and Veterinary Chemicals is the regulatory framework for agvet chemicals, established under the *Agricultural and Veterinary Chemicals (Administration) Act 1992* and is managed by DAWR. All agvet chemicals are registered by the APVMA, which makes risk assessments.
- National Environment Protection Measures guide jurisdictions on how to monitor the environment. The EPAs are responsible for environmental monitoring, including chemicals in the environment.
- The Australian Government and other state and territory governments and agencies have published multiple guidelines about the surveillance, assessment and management of chemical events.

- The National Residue Survey manages the risk of chemical residues and environmental contaminants in Australian animal and plant products.
- The *Australian Clinical Guidelines for Acute Exposures to Chemical Agents of Concern (Chemical Guidelines)* provide health facilities with standardized management of chemical warfare and toxic industrial chemical agent exposure.
- Poison information centres and poison treatment centres are not co-located, but collaborate to provide poison information. The Poisons Information Hotline is available 24 hours a day, seven days a week from anywhere in Australia.

Areas that need strengthening/challenges

- There are some inconsistencies in chemicals management due to Australia's federated system. Chemical regulation is spread among multiple agencies across eight jurisdictions. Mechanisms are in place to ensure that responsible agencies work together and consistently apply standards and guidelines; however, occasionally inconsistencies can occur.
- Although high-priority permitted chemicals are tracked by location licensed to work with them, there is no comprehensive national mapping of all chemical hazards to inform enhancements to chemical response planning efforts.
- Poison Information Centres and Poison Treatment Centres are a valuable source of early warning for chemical exposures, but are not routinely used on a real-time basis to provide such information to health authorities.
- Although information related to chemical events is routinely exchanged through several mechanisms between various sectors, there is no real-time national chemical situational awareness mechanism to inform rapid responses.

CE.2 Enabling environment in place for management of chemical events – Score 5

Strengths/best practices

- Australia has a well-established research capacity in the field of environmental health, which informs government policy and response.
- Several Australian agencies collaborate under the Regulators' Forum to coordinate information about chemicals management at both the operational and management levels.
- Australian agencies keep, or provide access to, several chemical databases.

Areas that need strengthening/challenges

- Surveillance of adverse events related to public use of chemicals is not well developed compared with medical adverse event reporting.

Radiation emergencies

Introduction

To counter radiological and nuclear emergencies, timely detection and an effective response towards potential radiological and nuclear hazards/events/emergencies are required in collaboration with sectors responsible for radiation emergency management.

Target

States Parties with surveillance and response capacity for radiological and nuclear hazards/events/emergencies. This requires effective communication and collaboration among the sectors responsible for radiological and nuclear emergency management.

Australia level of capabilities

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is the Australian Government's radiation regulator, responsible for licensing Commonwealth entities using radiation, and for ongoing compliance monitoring of these entities. Licence holders are responsible for having plans and arrangements in place to respond to a nuclear or radiological emergency. ARPANSA also has procedures in place for risk assessment in radio-nuclear surveillance and monitoring.

Radiation safety is covered in the Radiation Protection Series (RPS). These documents are regularly updated in line with international best practice, using codes and standards production and consultation procedures established through the Radiation Health Committee. Radiation emergency situations are considered in the RPS-7 (2004), which will soon be replaced by the Emergency Exposure Guide. Ongoing safety assessments are undertaken as part of licensing arrangements for nuclear facilities, of planning arrangements for foreign nuclear-powered vessels to Australian ports, and of the use of radioactive materials.

Radiation incidents in Australia are reported by the relevant Commonwealth, state or territory regulator through the Australian Radiation Incident Register. The National Directory for Radiation Protection details the reporting requirements. The Australian National Radiation Dose Register holds statistics for certain workers' exposures to ionizing radiation. As the designated National Competent Authority for radiation emergencies occurring both domestically and overseas, ARPANSA provides the link to the International Atomic Energy Agency. ARPANSA also supports the Office of Health Protection, DoH, for elements of the IHR (2005) related to radiation protection.

ARPANSA maintains the International Monitoring System, specialist detection capabilities, and the Australasian Radiation Laboratory Network. States and territories also maintain first response monitoring capabilities. Australia takes a risk-informed approach to monitoring consumer products, based on available information and intelligence. ARPANSA provides a National Association of Testing Authorities-accredited service for assessing levels of radioactivity in food and commodities for export, and has a scientific programme for monitoring seafood and seawater in northern Australian waters.

DIBP conducts checks of materials at the border, which includes checks for radioactivity. If radioactive materials are detected during the examination, an assessment will be conducted to determine the activity levels and legitimacy of the shipment. DIBP operates under a public dose limit. DIBP notifies the department's Radiation Safety Advisor of dose rate readings and type of goods. Depending on the situation, ARPANSA may be notified, which may require contact with the relevant state or territory health/environment protection agencies. If applicable, dependent on the type of material identified, the Australian Safeguards and Non-Proliferation Office within the Department of Foreign Affairs and Trade may also be notified.

State and territory governments maintain lists of health care facilities for dealing with radiation emergencies. The Radiological Guidelines outline appropriate treatment for radiation exposures. The Triage, Monitoring and Treatment Handbook is also applied, where appropriate.

The overall strategic plan for radiation safety is covered in the RPS. These documents are regularly updated in line with international best practices. The Health CBRN Plan details the roles and responsibilities for a radiological or nuclear event. Under the Health CBRN Plan, the Australian Clinical Guidelines for Radiological Emergencies (Radiological Guidelines) provide technical details for paramedics, hospital clinicians, and public health officials. Mechanisms for communicating with the public are in place, including notification of the need to shelter in the home, consume iodine tablets, or prepare for evacuation.

Emergency Management Australia has an audit system in place for Chemical, Biological, Radiological and Nuclear (CBRN) plans. States and territories, Nuclear Powered Warship (NPW) ports, ANSTO (Lucas Heights), ARPANSA and other facilities regularly hold exercises and drills for radiological events. National tabletop exercises are also held to test arrangements.

Recommendations for priority actions

- Enhance the interoperability of federal and state/territory radiation operations through broad multisectoral/multijurisdictional exercises.
- Develop federal guidance for jurisdictional first responder occupational exposures.
- Conduct a national hazard assessment, to include creating an inventory of radiation sources, and establish a national radiation capability register.

Indicators and scores

RE.1 Mechanisms established and functioning for detecting and responding to radiological and nuclear emergencies – Score 4

Strengths/best practices

- ARPANSA is the Australian Government's radiation regulator, and is part of the national coordination for responding to radio-nuclear emergencies. ARPANSA support to state and territory governments is provided to the relevant radiation protection agency or regulator in the jurisdiction that holds primary responsibility under the relevant state or territory legislation. Support may be in the form of liaison officers or technical products provided by electronic means. ARPANSA has several procedures for risk assessment in radio-nuclear surveillance and monitoring.
- The Health CBRN Plan developed by DoH sets out the agreed mechanisms through which coordination of a national health response to a CBRN incident of national significance occurs.

- All state and territory governments have emergency management and other legislation that may be applied in the event of a radiation or nuclear incident. States and territories also maintain plans and arrangements. This legislation is referred to in state and territory plans and covers a range of functions, including health, law and order, emergency supplies, transport, water, and local government.
- ARPANSA and the Peter MacCallum Cancer Institute form the Australian arm of the network of WHOCCs for Radiation Protection.

Areas that need strengthening/challenges

- No mechanisms currently exist for assessing health facilities' capacity to manage patients from radiation emergencies.

RE.2 Enabling environment in place for management of radiation emergencies – Score 4

Strengths/best practices

- Emergency response plans are in place for a variety of emergencies, whether accidental or deliberate. Plans are scalable, depending on the breadth of the emergency, and adaptable to the specific radiological hazard faced. Emergency Management Australia has an audit system in place for CBRN plans. The overall strategic plan for radiation safety is covered in the RPS, which includes a range of document categories.
- Australia's planning for Nuclear Powered Warship (NPW) visits provides an example of a best practice that has been presented internationally. This includes plans and arrangements at ports, modelling of potential releases during visits, radiological monitoring of air and water before, during, and after visits, and permit requirements for importing and exporting radioactive substances.
- States and territories, NPW, ANSTO, ARPANSA and other facilities regularly carry out exercises and drills for CBRN events. National tabletop exercises are also held to test arrangements.
- ARPANSA undertakes technical aspects of radiation safety in conjunction with jurisdictional health and regulatory agencies.

Areas that need strengthening/challenges

- The number of qualified radiation professionals in Australia is limited, and varies in each jurisdiction. Because of this, some jurisdictions are much better prepared for a domestic nuclear and/or radiological incident than others.
- Strategies for protection in an emergency need updating; the Emergency Exposure Guide needs to be finalized and promulgated.
- A thorough inventory of radiation sources in Australia, as well as available response assets, would help to identify needed response resources and inform response planning.

Appendix 1: JEE background

Mission place and dates

Melbourne, Australia: 24 – 27 November, 2017

Canberra, Australia: 28 November – 1 December, 2017

Mission team members

- Prof. Mika Salminen, Finland, Finnish National Institute for Health and Welfare (Team Leader)
- Mr. Ryan Baker, Canada, Public Safety Canada
- Ms. May Chiew, WHO Country Office of Lao People's Democratic Republic
- Dr. Susan Corning, World Organization for Animal Health
- Dr. Tamano Matsui, Japan, National Institute of Infectious Diseases
- Dr. Elizabeth Mumford, WHO Headquarters
- Dr. Natasha Murray, New Zealand, Ministry of Health New Zealand
- Dr. Babatunde Olowokure, WHO Regional Office for the Western Pacific
- Mr. Peter Rzeszotarski, United States of America, US Centers for Disease Control and Prevention
- Dr. Rajesh Sreedharan, WHO Headquarters
- Dr. Zhen Xu, China, Chinese Center for Disease Control and Prevention
- Ms. Tracy Gibbons, Canada, Public Health Agency of Canada *(Observer)*
- Dr. Andrea McNeill, New Zealand, Ministry of Health New Zealand *(Observer)*

Objective

To assess Australia's capacities and capabilities relevant to the 19 technical areas of the JEE tool for providing baseline data to support Australia's efforts to reform and improve their public health security.

The JEE process

The JEE process is a peer-to-peer review. The entire external evaluation, including discussions around the scores, the strengths, the areas that need strengthening, best practices, challenges and the priority actions should be collaborative, with JEE team members and host country experts seeking full agreement on all aspects of the final report findings and recommendations.

Should there be significant and irreconcilable disagreement between the external team members and the host country experts, or among the external, or among the host country experts, the JEE team lead will decide the outcome; this will be noted in the final report along with the justification for each party's position.

Preparation and implementation of the mission

On 19 January 2017, Australia voluntarily requested a JEE as part of their commitment to the monitoring and evaluation of core capacities under the IHR (2005). A JEE Planning and Coordination team was established within the Office of Health Protection of the Department of Health to provide oversight, coordination and logistical arrangements. The JEE in Australia was carried out in four stages: 1. Scoping and Planning; 2. Briefing; 3. Self-Evaluation Phase; and 4. External Evaluation Phase. During the self-evaluation phase, around 25 Australian Government agencies and national organizations and eight state and territory governments were involved.

Prior to JEE mission, five teleconferences were held between the JEE Planning and Coordination team in Australia and the WHO Regional Office of the Western Pacific. The purpose of these meetings were to discuss expectations, clarify the process and share updates on preparation for the JEE mission. The self-evaluation report and supporting documentation were shared with the JEE team approximately three weeks prior to the mission.

The mission began on 24 November 2017 with a briefing between Australia and international experts of the JEE team in Melbourne. Field visits were conducted on 25 November and 27 November 2017 and provided an opportunity for more in-depth discussions and verification of capacities. Field sites included Royal Melbourne Hospital, the Post Entry Quarantine Facility, the Australian Animal Health Laboratory, the Victorian Infectious Diseases Reference Laboratory, Melbourne International Airport, the Victorian Department of Health and Human Services, the Victorian Vaccine Distribution Centre and the DoH National Incident Room. After a transfer to the Capital city of Canberra, national and international experts jointly reviewed national capacities in the 19 technical areas of the JEE tool between 28 November and 30 November 2017.

The mission concluded on 1 December 2017 with a joint review and consensus on JEE scores and priority actions. The results of the assessment and observations of Australia's preparedness and response capacities were presented to the Chief Medical Officer Professor Brendan Murphy.

Limitations and assumptions

- The evaluation was limited to one week, which limited the amount and depth of information that could be managed.
- It is assumed that the results of this evaluation will be publically available.
- The evaluation is not just an audit. Information provided by Australia will not be independently verified but will be discussed and the evaluation rating mutually agreed to by the host country and the evaluation team. This is a peer-to-peer review.

Key host country participants and institutions

Australia lead representatives

- Prof. Brendan Murphy, Australian Government Chief Medical Officer
- Ms. Sharon Appleyard, First Assistant Secretary, Office of Health Protection, Department of Health
- Ms. Rhonda Owen, Assistant Secretary, Health Emergency Management Branch, Office of Health Protection, Department of Health
- Ms. Sarah Norris, A/g Assistant Secretary, Health Protection Policy Branch, Office of Health Protection, Department of Health
- Dr. Masha Somi, Assistant Secretary, Immunisation Branch, Office of Health Protection, Department of Health
- Dr. Jenny Firman, Principal Medical Adviser, Office of Health Protection, Department of Health
- Dr. Gary Lum, Principal Medical Adviser, Office of Health Protection, Department of Health
- Dr. Stephanie Williams, Principal Sector Specialist Health, Department of Foreign Affairs and Trade
- Mr. Joel Willis, Director, Border Health Section, Health Emergency Management Branch, Office of Health Protection, Department of Health

Australian Government JEE Planning and Coordination team

- Ms. Rhonda Owen, Assistant Secretary, Health Emergency Management Branch, Office of Health Protection, Department of Health
- Mr. Joel Willis, Director, Border Health Section, Health Emergency Management Branch, Office of Health Protection, Department of Health
- Ms. Mandy Charlton, Assistant Director, Border Health Section, Health Emergency Management Branch, Office of Health Protection, Department of Health
- Ms. Jen Phan, Policy Officer, Border Health Section, Health Emergency Management Branch, Office of Health Protection, Department of Health
- Ms. Tuyet Hoang, Graduate Policy Officer, Border Health Section, Health Emergency Management Branch, Office of Health Protection, Department of Health
- Ms. Cathy Hodge, Departmental Officer, Border Health Section, Health Emergency Management Branch, Office of Health Protection, Department of Health

Participating institutions

Department of Health

- Border Health Section, Health Emergency Management Branch, Office of Health Protection
- Communicable Diseases and Antimicrobial Resistance Policy Section, Health Protection Policy Branch, Office of Health Protection
- Communicable Disease Epidemiology and Surveillance Section, Health Protection Policy Branch, Office of Health Protection
- Communication and Change Branch, People Capability and Communication Division
- Deputy Chief Medical Officer

- Emergency Preparedness and Response Section, Health Emergency Management Branch, Office of Health Protection
- Food and Nutrition Policy Section, Preventive Health Policy Branch, Population Health and Sport Division
- Global Health Protection and Environmental Health Coordination, Health Protection Policy Branch, Office of Health Protection
- Health Emergency Countermeasures Section, Health Emergency Management Branch, Office of Health Protection
- Immunisation Policy Section, Immunisation Branch, Office of Health Protection
- Immunisation Procurement and Contract Management Section, Immunisation Branch, Office of Health Protection
- Immunisation Programmes Section, Immunisation Branch, Office of Health Protection
- Immunisation Registers Section, Immunisation Branch, Office of Health Protection
- International Engagement and Trade Section, International Strategies Branch, Health Systems Policy Division
- Media Unit
- Medical and Scientific Advisory Unit, Office of Health Protection
- Medical Shortages Section, Pharmacovigilance and Special Access Branch, Therapeutic Goods Administration
- Principal Medical Adviser, Strategic Policy & Innovation Group and Health Workforce Division
- Regulatory Policy Branch, Office of Health Protection
- Therapeutics, Intellectual Property and Chemicals Policy Section, Best Practice Regulation Branch, Health Systems Policy Division
- UN Health Section, International Strategies Branch, Health Systems Policy Division
- Workforce Data, Analysis and Planning Section, Health Workforce Reform Branch, Health Workforce Division

Department of Health Portfolio Agencies

- Australian Radiation Protection and Nuclear Agency
- Food Standards Australia New Zealand
- National Health and Medical Research Council
- National Industrial Chemicals Notification and Assessment Scheme / Office of Chemical Safety
- Office of the Gene Technology Regulator

Other ministries or agencies

- Attorney-General's Department
  - Crisis Coordination Branch, Emergency Management Australia
- Australian Federal Police
  - Biometrics Intelligence, Specialist Operations
- Australian Security Intelligence Organisation
- Department of Agriculture and Water Resources
  - Animal Disease Preparedness and Response Section, Animal Health Policy Branch, Biosecurity Animal Division
  - Approved Arrangements Section, Compliance Arrangements Branch, Compliance Division
  - Australian Bureau of Agricultural, Resource Economics and Sciences
  - Biosecurity Legislation Coordination Section, Biosecurity Implementation Branch, Biosecurity Policy and Implementation Division
  - Conveyances and Ports Section, Pathway Compliance Branch, Compliance Division
  - Epidemiology and One Health Section, Animal Health Policy Branch, Biosecurity Animal Division
  - Imported Food Section, Compliance Policy Branch, Compliance Division
  - Office of the Chief Veterinary Officer
  - Pathway Surveillance and Operational Science Section, Pathway Compliance Branch, Compliance Division
  - PEQ Services Group
  - Service Delivery, Inspection Services
  - Travellers, Inspections Services
  - Travellers Section, Pathway Compliance Branch, Compliance Division
  - Water Policy Section, National Water Policy Branch, Water Division
- Department of Agriculture and Water Resources Portfolio Agencies
  - Australian Pesticides and Veterinary Medicines Authority
- Department of Defence
  - Defence Intelligence Organisation
  - Defence Materials Technology Centre
  - Medical Countermeasure Development, Chemical Biological Defence, Land Division, Defence Science and Technology Group
- Department of Employment Portfolio Agencies
  - Safe Work Australia
- Department of Environment and Energy
  - Environment Standards Division
- Department of Immigration and Border Protection
  - Traveller Policy Advice and Support Section, Traveller Policy Branch

- Department of Industry, Innovation and Science
  - Chemicals and Business Facilitation Section
- Department of Human Services
  - Assistance Programmes Branch, Health and Aged Care Group, Health Programmes Division
- Department of Foreign Affairs and Trade
  - Health Strategies Section, Health Policy Branch, Development Policy Division
  - Humanitarian Preparedness & Response Section, Humanitarian Response, Risk & Recovery Branch, Humanitarian, NGOs and Partnerships Division
  - Principal Sector Specialist Health, Health Policy Branch, Development Policy Division
- Department of Prime Minister and Cabinet
  - Crisis Management Section, Civil Security Unit, National Security Division

Expert Committees/Organizations

- Animal Health Australia
- Australian Animal Health Laboratory
- Australian Commission on Safety and Quality in Health Care
- Australian Health Protection Principal Committee
- Chair and Deputy Chair, Australian Technical Advisory Group on Immunisation
- Chemical, Biological, Radiological and Nuclear Subcommittee of the Australia-New Zealand Counter Terrorism Committee
- Communicable Disease Network Australia, Standing Committee of the Australian Health Protection Principal Committee
- Chief Human Biosecurity Officers
- Environmental Health Standing Committee of the Australian Health Protection Principal Committee
- Environmental Protection Agency, South Australia
- Microbiological Diagnostic Unit Public Health Laboratory, The Peter Doherty Institute for Infection and Immunity
- National Centre for Antimicrobial Stewardship
- National Centre for Epidemiology and Public Health, Australian National University
- National Critical Care and Trauma Response Centre, Royal Darwin Hospital
- National Health Emergency Management Standing Committee of the Australian Health Protection Principal Committee
- National Measurement Institute
- National Medical Stockpile Advisory Group
- National Surveillance Committee, a subcommittee of the Communicable Diseases Network Australia
- NPS MedicineWise
- PathWest Laboratory Medicine WA

- Public Health Laboratory Network, a Standing Committee of the Australian Health Protection Principal Committee
- School of Animal and Veterinary Science, The University of Adelaide
- School of Public Health and Community Medicine, University of New South Wales
- Victorian Infectious Disease Reference Laboratory, The Peter Doherty Institute for Infection and Immunity

State and Territory Governments

- Australian Capital Territory Health
- Queensland Department of Agriculture and Fisheries, Biosecurity Queensland
- Queensland Department of Health
- South Australia Department of Primary Industry and Regions
- South Australia Health
- New South Wales Food Authority
- New South Wales Ministry of Health
- New South Wales Department of Primary Industries
- Northern Territory Department of Health
- Northern Territory Department of Primary Industry and Resources
- Tasmania Department of Health and Human Services
- Tasmania Department of Primary Industries, Parks, Water and Environment
- Victorian Department of Health and Human Services
- Western Australia Department of Agriculture and Food
- Western Australia Department of Health

Supporting documentation provided by host country

Materials provided to the external JEE team prior to the mission

- *Joint External Evaluation Australia: Self-Evaluation Report November 2017.* Office of Health Protection, © Australian Government Department of Health and collaborating partners. *Pdf 331 p.*

Presentations to the JEE team during the mission

Australia's Health System – Professor Brendan Murphy, Australian Government Chief Medical Officer, Department of Health. *PowerPoint Presentation 24.11.2017, Melbourne*

- *Mapping the JEE responsibilities – a multi-level and multi-sectoral approach* - Ms Sharon Appleyard, First Assistant Secretary, Office of Health Protection. *PowerPoint Presentation 24.11.2017, Melbourne*
- *Health Protection in Victoria* – Dr. Brett Sutton, Deputy Chief Health Officer (Communicable Disease), Department of Health and Human Services, Health Protection Branch, Government of Victoria. *PowerPoint Presentation 24.11.2017, Melbourne*
- *JEE IHR Technical areas 1-19. Individual PowerPoint Presentations 28-30.11.2017, Canberra.*
- National legislation, policy and financing
- *Australia New Zealand Food Standards Code,* FSANZ
- *Biosecurity Act 2015,* DoH and DAWR 2015
- *National Health Security Act 2007,* DoH 2007
- National Health Security Agreement, Australian and state and territory health departments, 2008
- National Notifiable Disease List, DoH 2008
- National Notifiable Diseases Surveillance System, DoH 1990
- National Framework for Communicable Disease Control, DoH 2014
- IHR coordination, communication and advocacy
- Australian Government Crisis Management Framework (AGCMF), PM&C 2016
- National Health Emergency Response Arrangements (NatHealth Arrangements), DoH 2011
- *National Health Security Act 2007,* DoH 2007
- National Health Security Agreement DoH 2008
- National Incident Room SOP – Contact Tracing, DoH 2016
- Review of the implementation of the Australian Government's response to the West Africa Ebola outbreak, DFAT 2015
- Antimicrobial resistance
- Australia's First National Antimicrobial Resistance Strategy 2015-2019; Progress Report, Nov 2017
- AURA Annual Report 2016-17, ACSQHC
- CARAlert Handbook, ACSQHC 2017
- Guidelines for Veterinary Personal Biosecurity, AVA 2017

- Implementation plan: Antimicrobial Resistance Strategy 2015–2019, DoH and DAWR 2016
- National Safety and Quality Health Service (NSQHS) Standard 3; Preventing and controlling healthcare associated infections, 2011
- Recommendations for the Control of Carbapenemase-Producing Enterobacteriaceae (CPE): A Guide for Acute Care Health Facilities, ACSQHC 2017
- Responding to the threat of antimicrobial resistance; Australia's First National Antimicrobial Resistance Strategy 2015–2019, (includes national list of priority organisms, section 3.3), DoH and DAWR 2015
- Stewardship Clinical Care Standard, 2014
- Surveillance and reporting of antimicrobial resistance and antibiotic usage in animals and agriculture in Australia, 2014 (University of Adelaide, Griffith University)
- Zoonotic diseases
- Animal Health in Australia report, Animal Health Australia 2015
- Animal Health Surveillance Quarterly, Animal Health Australia
- Australian Government Agricultural Incident Plan
- Australian Government Crisis Management Framework, 2016
- Australian Veterinary Emergency Plan (AUSVETPLAN), Animal Health Australia 2008
- *Biosecurity (Listed Human Diseases) Determination 2016,* DoH 2016
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