

NATIONAL FRAMEWORK FOR COMMUNICABLE DISEASE CONTROL



Australian Government
Department of Health

National Framework for Communicable Disease Control

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1. Executive Summary

Australia has achieved low rates of infectious or communicable disease (CD) for the last sixty years. Federal and state governments fund CD control activities but states and territories have primary responsibility for detecting and controlling CD in their jurisdiction. The Commonwealth is broadly responsible for managing the risk of imported CD and national health emergencies. National activities are organised and agreed through a multiplicity of committees, advisory and expert groups.

A more coordinated, strategic approach is increasingly important to maintain and improve CD control. Communicable diseases present an ever changing risk to society, especially considering the speed and scale of national and international travel, and cannot be managed within nation states or in jurisdictions within a nation.

Current arrangements would be enhanced by improved national coordination, and a delineation of functions and responsibilities to help national priority setting and decision-making. Incompatible data systems, different laboratory testing and inconsistent legislation currently limit identification and control of inter-state outbreaks and emerging national CD issues. Delays in detection can hamper an effective response. The potential costs to health and the economy are considerable.

The process of developing a national framework represents the first time that CD prevention and control has been considered and assessed at the national level.

The National Framework for Communicable Disease Control (the Framework):

- Brings together government, agencies and committees under the goal of strengthening our defences against communicable diseases.
- Recommends outcomes required to achieve the two key objectives:
 1. *Improved communicable disease prevention, detection and response*
 2. *Improved organisation and delivery of CD control*
- And in doing so, supports the delivery of an integrated, national CD response.

The Framework does not change the responsibilities of the Australian Government or state and territory governments. It focuses on national coordination and prioritisation of key CD system elements¹. Within system elements, the Framework identifies directions for change and opportunities for action to strengthen the system.

The Framework was developed in partnership with states and territories. Extensive consultation with key stakeholders revealed overwhelming support for greater national coordination of CD prevention and control.

Further work is required to develop governance and policy options to implement the Framework. Implementation will focus on building on and improving our current system of CD prevention and control.

¹ System elements: Surveillance and laboratory testing, Preparedness and Response, Evidence-based policies, Health Communications, Leadership and Governance, Skilled people, Information systems and Research Capacity, Financing and Infrastructure, Partnerships and Networks

2. Background

Australia has made considerable progress over the last century, reducing communicable disease related mortality from 13% of all deaths in 1907 to 1.3% in 2009 [1]. Progress can be attributed to improvements in sanitation, the introduction of antibiotics and vaccines, and ongoing work of health departments responding to outbreaks and monitoring important infections. Equally important contributions are economic growth, improved nutrition, political and civil institutions, and better access to health care.

But communicable diseases remain important and are still relatively common in Australia:

- Infections account for 1 in 6 problems managed by general practitioners;
- Infections are the principal diagnosis for over 120,000 hospitalisations per year, mostly in the public system;
- There are around 200,000 healthcare-associated infections (HAIs) in Australian acute healthcare facilities each year [1,2].

Today's communicable diseases challenges are more complex than they were in 1996, when the first (and only) national communicable disease surveillance strategy was written, and include:

- The speed and scale of national and international travel require countries to maintain constant alert and preparedness for potential pandemic threats. The rapid global spread of influenza H1N1 2009 virus demonstrated that communicable diseases cannot be managed within nation states or in jurisdictions within a nation.
- Rising antibiotic-resistant bacterial infections in hospitals and increasingly in the community is rendering first line treatments ineffective.
- Increasing national rates of known threats such as pertussis (whooping cough), laboratory-confirmed influenza, gonococcal infections, chlamydia infections, campylobacteriosis and salmonellosis [1].
- Absolute numbers of tuberculosis (TB) notifications are increasing with 80%–90% of Australia's new cases occurring in arrivals from overseas, including student and healthcare worker arrivals [3]. Spread of multi-drug resistant TB from neighbouring countries presents a continued risk to Australia's TB control program.
- Growing recognition of the fact that infectious agents can cause chronic diseases (chronic viral hepatitis infections cause liver cancer, human papillomavirus infections cause cervical cancer, and *Helicobacter pylori* bacterial infections are linked to gastric cancer) and represent increasing and potentially avoidable costs to the health system.
- New diseases are emerging more frequently, for example novel Middle East respiratory syndrome coronavirus (MERS-CoV), and new strains of influenza with pandemic potential such as avian influenza H5N1 and H7N9. Emerging infectious diseases are an ongoing risk of epidemics or pandemics.

- Continued risk of foodborne disease spread through the global food supply chain. In 2011, Shiga toxin producing enterohaemorrhagic *Escherichia coli* contaminated fenugreek seeds imported from Egypt to Germany for sprouts infected 3816 people, caused 846 cases of haemolytic uraemic syndrome and killed 54 people [4]. In 2009-2010, Australia suffered a number of hepatitis A cases linked to imported semi-sundried tomatoes.
- Communicable disease consequences from natural disasters including bush fires, floods, cyclones. Flooding in the summer of 2011 resulted in a number of water borne infections in Queensland and increased arbovirus infections including Murray Valley Encephalitis virus and Ross River virus in southern Australia. It is thought that ecosystem changes following the flood event caused bats to move to other roosts, bringing together Hendra virus naive bats with colonies where bats were infected with the Hendra virus.

The economic impact of communicable disease outbreaks can be very significant. The WHO estimates that the Bovine Spongiform Encephalopathy (BSE) outbreak cost US\$38 billion, Nipah virus outbreak in Malaysia US\$540 million, West Nile virus in New York over US\$100 million and Severe Acute Respiratory Syndrome (SARS) cost Asian countries US\$60 billion of gross expenditure and business losses in the second quarter of 2003 alone.

More new and re-emerging communicable diseases are inevitable due to changing interactions between humans, the environment and organisms. Although inevitable, they are almost impossible to predict. It is essential that Australia has excellent surveillance, capacity for early assessment of potential threats and comprehensive response plans to minimise their acute and longer term impacts. Australia must prioritise preparedness and maintain a resilient, flexible system with sufficient skilled human capital to respond to all threats – known and unknown.

Addressing potential or existing risks that originate at the animal-human-ecosystems interface must be underpinned by a One Health approach: a coordinated, collaborative, multidisciplinary and cross-sectoral approach in the development of health strategies for people, animals and the environment.² Particularly in the context of emerging infectious diseases, One Health unifies clinical and veterinary health and directly links this with environmental health research, and this is critically important for preparedness for the next zoonotic pandemic.

2 One Health Global Network: One Health: a concept that became an approach and then a movement -http://www.onehealthglobal.net/?page_id=131

3. The case for change

The emerging challenges in communicable disease (CD) control demand a flexible and integrated system. Instead of looking at CD control through separate responsibilities and activities of the Australian Government and state and territory governments, the proposed Framework envisaged a CD control system with key **functions** (what we do) and **enablers** (how we do it) (Figure 1). A highly functioning system underpins all efforts to detect, prevent and respond to CD threats to public health.

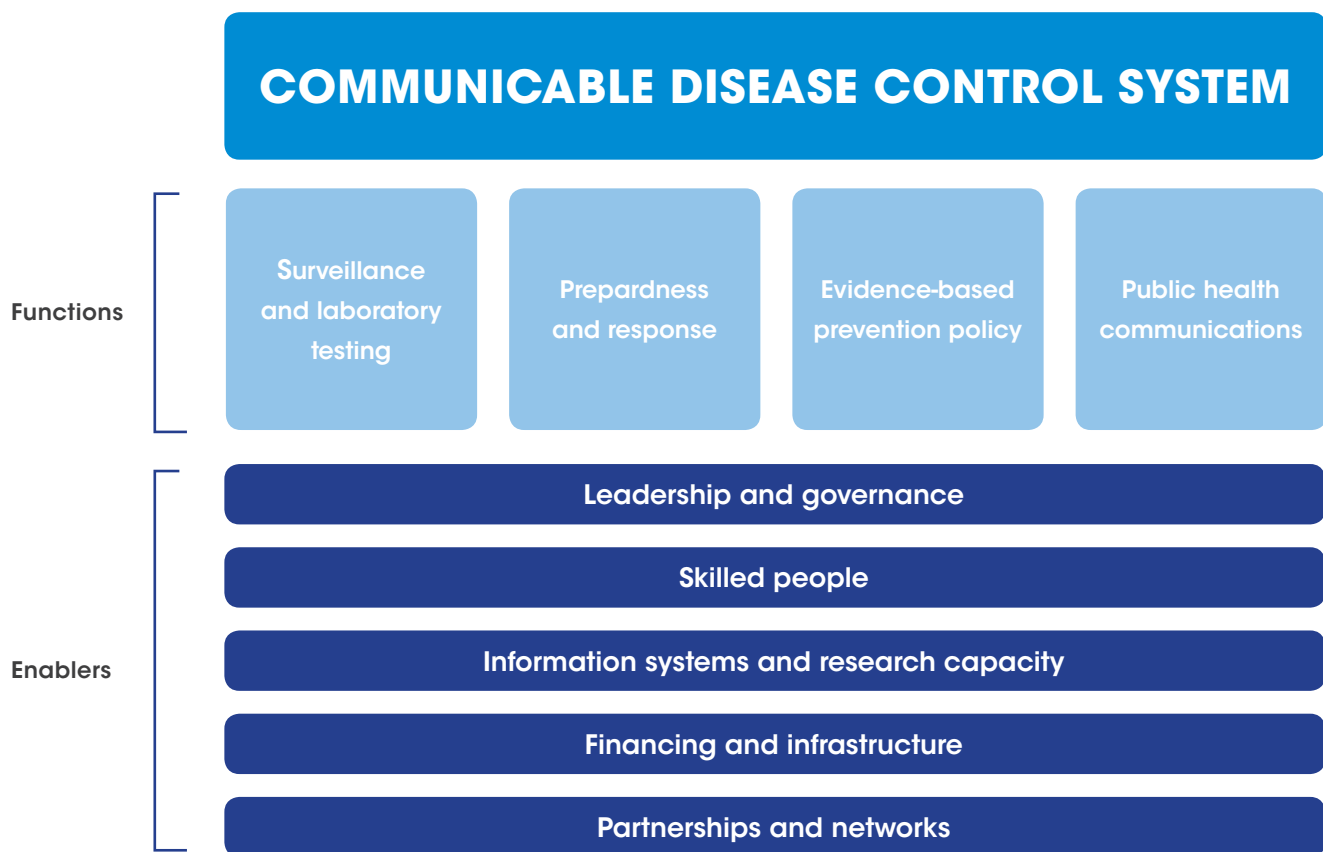


Figure 1. A CD control system of functions and enablers

Using the system elements (Figure 1) to assess Australia’s capacity to address emerging challenges for CD control highlighted a number of limitations, including:

Fragmentation

- Under Australia's constitution, states and territories have primary responsibility for public health issues, including identifying, treating and controlling communicable diseases.
- Seven Commonwealth agencies³ are responsible for managing Australia's exposure to imported infectious diseases and the risk of epidemic or pandemic disease outbreaks. The Commonwealth also needs state and territory resources to meet its own responsibilities.

Coordination

- The shared responsibility for public health involves service delivery by the states and territories, coordination by the Commonwealth and decision making by committees of federal and state representatives.
- Commonwealth, state and territory governments organise CD control through a complex network of more than 60 joint committees, networks, surveillance systems and national centres. The large number of committees are required to process increasingly complex information and advise on decisions.
- Although many report to the Australian Health Protection Principal Committee (AHPPC) – through its principal committees – there is no overarching strategy or central point that coordinates, analyses performance, or promotes evidence-based policies. This has led to a lack of defined national priorities and formal strategic planning.

Duplication

- Many CD challenges are common across states and territories, however each jurisdiction develops its own resources and processes resulting in overlapping policies, duplication of effort and inefficient use of resources.

Workforce

- Workforce shortages exist across multiple CD disciplines, exacerbated by uneven distribution, and result in inadequate surge capacity for emergencies.
- Current education and training arrangements do not support future needs of communicable disease control.

Critical infrastructure

- A shortfall in investment in common technologies and infrastructure has hindered efficient sharing of information to support CD control, surveillance, laboratory testing and response.
- The identification and control of inter-state outbreaks and emerging national CD issues is limited by incompatible data systems and differing laboratory testing approaches.

3 Agencies include: The Department of the Prime Minister and Cabinet (PM&C); The Attorney-General's Department (AGD); The Department of Health (Health); The Department of Immigration and Border Protection; The Department of Agriculture; The Department of Foreign Affairs and Trade (DFAT); DFAT's Aid Program (formerly The Australian Agency for International Development (AusAID)); and The Department of Defence.

Performance and accountability

- There is a lack of performance and effectiveness measures to support CD professionals, consumers, funders and policy makers.

The system limitations compromise the efficient and effective delivery of prevention programs, accurate and timely surveillance, and epidemiological investigations and response to outbreaks. The system limitations make it difficult to comprehensively address national threats making Australia vulnerable to the potentially disastrous consequences of detecting a national problem once the opportunity to mount an effective response has passed.

4. Why a national framework?

A more coordinated, strategic approach is increasingly important to maintain and improve CD control. While effective disease control is the responsibility of all levels of government in Australia, taking a national approach in certain areas can be a more effective and efficient use of national resources. A nationally consistent approach has considerable advantages for individual jurisdictions by streamlining processes and centralising some aspects of CD control, allowing a focus on policy priorities and optimal use of resources.

A national framework can deliver a more integrated response without changing responsibilities of governments. It involves a commitment from all parties to work together better in areas of shared responsibility. It also involves a commitment to better coordinate the public health functions and services of CD control – avoiding duplication, coordinating planning and implementation and better sharing of information and innovation.

A national framework provides an opportunity to drive improvements across all systems and all jurisdictions. It also provides a mechanism for engaging the non-government sector and the broader community on a national level.

The Framework was developed in partnership with states and territories. Extensive consultation with key stakeholders revealed overwhelming support for greater national coordination of CD prevention and control.

The National Framework for Communicable Disease Control (the Framework):

- Brings together government, agencies and committees under the goal of strengthening our defences against communicable diseases.
- Recommends outcomes required to achieve the two key objectives:
 1. *Improved prevention, detection and response*
 2. *Improved organisation and delivery of CD control*
- And in doing so, supports the delivery of an integrated, national CD response.

Further work is required to develop governance and policy options to achieve the Framework's objectives. It is important that implementation focuses on building on and improving our current system of CD prevention and control.

5. A National Framework for Communicable Disease Control

Vision

To have a healthier population by protecting Australians from the health, social and economic impacts of communicable diseases

Goal

To strengthen our defences against communicable diseases

Objectives

Achieving the goal requires:

1. Improved national communicable disease prevention, detection and response
2. Improved organisation and delivery of communicable disease control

Outcomes

Each objective can be achieved through key outcomes:

Objective 1. Improved national prevention, detection and response

- Outcome 1.1 Better surveillance and public health laboratory testing
- Outcome 1.2 Improved preparedness and response capacity
- Outcome 1.3 Implementation of evidence-based prevention policies
- Outcome 1.4 Effective public health communications

Objective 2. Improved organisation and delivery of communicable disease control

- Outcome 2.1 Strong leadership and governance
- Outcome 2.2 Skilled people
- Outcome 2.3 Improved information systems and research capacity
- Outcome 2.4 Adequate and appropriate financing and infrastructure
- Outcome 2.5 Effective partnerships and networks
- Outcome 2.6 Effective international engagement

While each outcome area is important in its own right, the Framework acknowledges the interrelations between them all and recognises that specific action under one outcome area can also support the goals of others.



Figure 2. Objectives and outcomes for national CD control

The following sections discuss the challenges and directions for change that relate to each outcome area, and identify actions to achieve the outcomes.

Objective 1. Improved national prevention, detection and response

Outcome 1.1 Better surveillance and public health laboratory testing

Surveillance

National CD surveillance, the collection and analysis of disease information providing data for action, is essential information for reducing disease and controlling outbreaks, and saving lives. Surveillance data are also required to monitor the effectiveness, timeliness, and cost-effectiveness of current prevention and control efforts, and to identify gaps and new prevention strategies.

Directions for change

Current efforts are hampered by the fragmented nature of data collections, with jurisdictions collecting and storing information differently. Although the nature and number of surveillance systems has grown to meet growing information needs, the expansion has been ad-hoc and reactive to short term funding cycles. National surveillance has improved our understanding of the impact of some diseases and the effectiveness of interventions, for example in vaccine-preventable diseases. But other threats, such as zoonotic and vector-borne disease and antimicrobial resistance, are less coordinated in their surveillance activities, increasing the risk of undetected disease and hampering prevention and control. Australia would benefit a more coordinated approach to surveillance, strengthening fundamental notifiable disease surveillance and promoting innovative surveillance methods, accompanied by analytical frameworks to ensure the information can be readily used by decision-makers.

Change can be achieved through:

Improving CD surveillance at national and jurisdictional levels requires agreement on national surveillance strategic priorities including:

- Working towards inter-operable timely notifiable disease surveillance, development of surveillance indicators that support disease control goals; and a commitment to systematic continuous quality improvement.
- Optimising surveillance expertise through better coordination and support of jurisdictional and federal governments, the Communicable Disease Network Australia, as well as national centres and separate research institutions.
- Modernising surveillance through formalised linkages with existing datasets and using technology to improve the quality and accessibility of data, increasing the sensitivity and power of surveillance systems to monitor CDs and their determinants.
- Effective identification of emerging surveillance opportunities, pathways to integration of such systems and scope for innovation.

What the future looks like

For notifiable diseases, an integrated platform enables a real-time picture of potential outbreaks. Comprehensive, coordinated surveillance of all threats identifies areas and populations at increased risk for infection, supporting attempts to prioritise public health interventions. Surveillance systems support disease control programs through monitoring of key indicators. Quality improvement is embedded in the system through ongoing evaluation of surveillance methods. Coordinated surveillance expertise, supported by analytical frameworks, enables the use of new technologies, electronic networks, and other innovative methods to make disease surveillance faster, more sensitive, and less expensive.

Public health laboratory testing

Laboratory-based diagnosis and characterisation of infectious agents supports all other core functions in communicable disease control. Surveillance depends on accurate diagnoses, and outbreak management depends on quick identification of the causative agent. This is especially true in relation to deliberate and accidental releases of pathogens. Strategic decisions about potentially dangerous outbreaks, which may lead to use of considerable resources, rely on laboratory test results. Specialised testing such as molecular typing is becoming important in determining transmission pathways, defining outbreak clusters, and identifying emerging and virulent strains. Specialised testing helps tailor prevention techniques (e.g. influenza vaccine composition) and therapy for infections (e.g. in the case of antimicrobial resistance).

Directions for change

Achieving nationally consistent laboratory-based surveillance, which is fundamental to communicable disease surveillance, faces major challenges. These include: aligning governance and reporting models for public health laboratories and national centres; harmonising laboratory based surveillance methods between jurisdictional public health reference laboratories; improving information sharing between laboratories, public health authorities and clinicians; and agreeing on sustainable financing mechanisms for public health laboratory activities. National surveillance efforts must also recognise the contribution of private laboratories and seek to align notification requirements throughout the country.

Change can be achieved through:

Improving capacity and performance of public health laboratory services by:

- Nominating and enabling lead laboratories to coordinate national activity and offer regional resources, for particular threats, tests and technologies. This builds on the strength of existing networks and maintains expertise in the system.
- Networking existing reference facilities and expert institutions, embedding national reference programs in each of the state facilities reflecting equitable distribution between the states and territories, individual expertise and geographical requirements.
- Actively engaging with the private pathology sector in development of public health laboratory strategies and planning.

Nationally organised and integrated public health laboratory networks enable:

- Rational harmonisation of laboratory testing through a combination of single site reference testing for uncommon organisms, alignment of testing technology and methods for priority public health organisms; and validating methods to compare test results from different technologies and methods.
- Advanced efforts to network and share laboratory information to support surveillance, prevention and control goals, improving information flow to all providers of CD control services.

What the future looks like

Communicable disease control efforts are supported by networked laboratory expertise throughout Australia, enabling reliable, timely laboratory testing of priority public health organisms. There is automatic electronic laboratory reporting of notifiable diseases from clinical laboratories to jurisdictional and federal health departments, enabling timely detection, prevention and response. Electronic mechanisms for exchange of public health information, including laboratory orders and test results, between diagnostic laboratories (both public and private) improve information flow throughout the system. Central coordination of national public health laboratories enables strategic planning to ensure continued national reference capacity for all CD threats and improvements to testing, operating models and quality assurance.

Outcome 1.2 Improved national preparedness and response capacity

Directions for change

National health emergency preparedness and response is a whole-of-government responsibility. For communicable disease emergencies, peak committees including AHPPC and CDNA are critical to advise on the national response. But emergency coordination by committee does not always facilitate responsive decision-making. The key challenge is that jurisdictional committee members have dual roles, leading the outbreak response in their own state or territory as well as enabling national committees to operate. Furthermore, rapid national threat assessments need to be conducted as a threat emerges and revised as new evidence is generated. Committee meetings, even if frequent, do not suit this acute but ongoing technical work. Developing a central technical capacity for threat assessment and decision support would significantly improve Australia's emergency response capability.

Faced with an unknown threat, understanding the epidemiological characteristics, such as who is most at risk of infection or severe outcomes, is vital to inform targeted responses. Pre-agreed investigative plans should identify the types of research and epidemiological investigations required at the early stages of an epidemic, and establish the necessary partnerships to undertake the research when needed. To ensure structured information gathering during an acute event, there is a need to develop pre-event investigative protocols for collecting data on risk factors, disease severity, and other clinical information. As an example the food safety sector, through OzFoodNet and Food Standards Australia New Zealand, has pre-agreed multijurisdictional outbreak investigation guidelines,

including data collection protocols and health communication plans. These guidelines have improved national responses to foodborne diseases events.

Planning assumptions for threat-specific preparedness should be updated regularly to reflect the best scientific evidence. For example, the Australian Health Management Plan for Pandemic Influenza (AHMPPI) includes evidence-based assumptions about a pandemic virus (i.e. clinical attack rate) and its impact (i.e. hospitalisations and deaths). Mathematical modelling of some of these assumptions provides policy makers with a range of scenarios to support flexible, adaptable public health responses.

Change can be achieved through:

- Developing central capacity for threat assessment and decision-support for new threats and multijurisdictional events.
- Developing pre-event investigation protocols for communicable disease outbreaks.
- Ensuring threat-specific planning incorporates the best evidence and where appropriate, applied research, such as mathematical modelling, informs planning.

What the future looks like

Australia's preparedness for national CD events is strengthened by comprehensive threat-specific assessment and planning, and coordinated surveillance, laboratory detection and epidemiological investigations. Timely and effective responses to CD threats or emergencies are enabled through the use of pre-agreed investigative protocols that facilitate a cooperative multi-stakeholder approach, effective communications, and robust science-based decision making. Rapid national threat assessments are conducted as a threat emerges and revised as new evidence is generated. Lessons identified from outbreak responses are regularly used to strengthen overall preparedness.

Outcome 1.3 Implementation of evidence-based national prevention policies

Directions for change

Protecting Australians from communicable diseases requires evidence-based policies that support delivery of CD prevention measures and improve the health of vulnerable populations. National agreement on prevention priorities is needed. Ideally, priority areas would see well-performing programs improved and development of programs where little or nothing exists. Actions should address high-burden diseases and diseases for which control programs are known to reduce disease.

Systematic risk appraisals could also support planning by assessing current disease trends and future predictions in the context of social, economic, political and environmental factors driving communicable disease. Growing recognition of the link between some infections and chronic disease (chronic viral hepatitis infections cause liver cancer, human papillomavirus infections cause cervical cancer, and *Helicobacter pylori* bacterial infections are linked to gastric cancer) highlights the need for longer-term planning.

High priority areas also include populations that suffer a disproportionately high burden of communicable diseases including: Aboriginal and Torres Strait Islander people, the elderly, immunocompromised people, new arrivals to the country, such as refugees and immigrants, and people of lower socioeconomic means. While a framework considers functions that support all disease areas, disease- or population-specific strategies and programs are equally important for prevention and control.

To achieve comprehensive national CD prevention policies, a more systematic and inclusive approach to production, implementation and evaluation is needed. Policies should reflect national priorities, and where appropriate support disease control goals or performance targets. Measures of performance are needed for meaningful evaluation.

Recognising that prevention encompasses the biomedical, social, environmental, economic and behavioural determinants of health, policy development should extend beyond the public health and healthcare communities to engage stakeholders and other partners across multiple sectors and specialties.

Policy development must include synthesis and interpretation of relevant and quality evidence. Where evidence is needed to influence or develop policy, it could be commissioned to match policy-relevant questions. Policy directed research needs to be flexible, timely and cost-effective, making the most of existing data and partnerships in the communicable disease control community. And in order to inform national policy, evidence and research should be on a national scale and represent all jurisdictions where feasible.

Change can be achieved through:

- Establishing national prevention priorities for communicable diseases.
- Developing national capacity to ensure systematic and collaborative policy development process for priority communicable disease threats.
- Ensuring known effective prevention programs are nationally consistent and implemented, accompanied by monitoring and evaluation frameworks.
- Engaging with researchers and commissioning policy relevant research to support evidence-based policy development.

What the future looks like

National evidence-based policies are developed collaboratively and address national priorities including antimicrobial resistance, and a One Health approach to address risks of emerging infectious diseases. Health inequities are addressed by targeting resources where the need is greatest, while helping ensure that majority of the population benefits from proven interventions. Health authorities continue to partner with non-health sectors to develop policies that address the social, environmental, economic and biomedical determinants of health. Performance measures, supported by monitoring and evaluation frameworks, ensure continued commitment to improving CD control activities and health outcomes.

Outcome 1.4 Effective public health communications

Health communication is especially important in communicable diseases. The surfacing of new infectious organisms, microbial resistance to therapeutic drugs, and the new emerging diseases represent public health threats that can spread quickly and unexpectedly. These trends have expanded the role of health communication as a vital component of public health practice [5].

Directions for change

Health risk communication is an emerging discipline within public health, requiring greater attention to evidence-based strategies and evaluation of existing ways that government communicates with the public. It is a two-way channel that requires government to listen and evaluate knowledge and understanding of public health information, rather than rely on standard modes of communication such as fact sheets or advertising campaigns.

Health communication programs need to consider specific groups representing different sets of beliefs, values, attitudes, social and cultural norms and perceptions. Therefore, the use of specific health communication strategies and techniques can tailor messages to maximise public attention, raise awareness of health risks, contribute to improve health literacy levels, promote solutions and increase the likelihood of adoption of health behaviours and practice [5].

During national health emergencies or CD events, there is considerable public interest. Effective communication strategies are essential and in some cases, communication will be the only response action to an incident. National messages need to be centrally coordinated to ensure consistency, timely and accurate information is provided to the public, directly or through media organisations. A recognisable and trusted leader should lead public communications.

Change can be achieved through:

- Making communication an integral part of all CD scientific and technical work, informed by evidence-based interventions and evaluation.
- Commitment to research the impact of health communications in the CD control field, and determining the most effective strategies for meeting the needs of population groups with low literacy levels, and those who are vulnerable, disadvantaged and hard to reach.
- Developing all-hazard health sector communication guidelines identifying Commonwealth and jurisdictional functions and responsibilities, including agreed spokespeople and the objectives, actions and target audiences for various stages of a national CD emergency.

What the future looks like

Health communications in CD control are informed by evidence of the way different population groups access, use and understand health information, leading to targeted communication strategies that improve prevention and control of CD. During national events or emergencies, the public identify a credible and trusted leader, health sector communications are timely, effective and consistent and achieve their objectives.

Objective 2. Improved organisation and delivery of communicable disease control

Outcome 2.1 Strong leadership and governance

Directions for change

Key challenges for national CD control are: to better integrate and coordinate the range of organisations and service providers operating within CD control and, to better link CD control and other sectors in and out of healthcare. This is especially important to support a One Health approach to diseases that span the human, animal and agricultural sector.

Improving coordination requires changes, particularly at the national level to:

- enable collaboration and integration between CD control service providers to focus on national CD priorities, population health needs and outcomes;
- coordinate and improve national prevention, detection and response efforts, monitoring effectiveness and outcomes, to reduce duplication and fill gaps; and
- allow flexibility to deliver additional services that respond to priority jurisdictional or local needs.

Many of these changes could be implemented through a national governance structure with:

- strong leadership and community engagement and support;
- clear performance expectations both in terms of identifying CD control and population health needs and being accountable for progress in meeting those needs; and,
- funding to drive integration, coordinate technical advice and national surveillance activities, provide education and training, and ensure gaps in national capacity arrangements are filled.

Notably, a national CD control governance structure or coordinating body could manage supplementary funding, targeting elements where a national approach can drive improved outcomes and system efficiencies.

What the future looks like

Previously fragmented CD control efforts of seven Commonwealth agencies and eight states and territories are coordinated through strong and visible leadership providing nationally unified direction, especially during health emergencies. Efficient and responsive decision-making supports a national approach to CD control, including agreed national prevention priorities.

A national governance structure provides efficiencies and better integration with states and territories responsible for controlling the same communicable diseases. There is oversight of the work of national centres and new national technical bodies, ensuring national technical expertise exists across the communicable disease spectrum. Gaps in coordinated expertise, surveillance, and response to emerging, zoonotic and vector-borne infections are filled under a One Health approach.

Outcome 2.2 Skilled people

Directions for change

The future CD control workforce must be educated and trained to meet 21st century challenges. The CD control workforce brings together diverse professionals, not always aligned into traditional health workforce categories, as they include public health and clinical professionals. The skills and knowledge required by CD control professionals may or may not be acquired from a previous professional training or general public health degree. To this end, specialised training programs such as a Master of Applied Epidemiology are needed to support the development of CD control skills. Further development of such programs will ensure Australia has the human capacity for surveillance design and interpretation, outbreak investigation, and use of interpretative tools so that public health data are translated into useful evidence for decision makers. Ensuring surge capacity to support national emergencies is vital.

Workforce planning requires assessment of current and future workforce needs and determining competencies and skills needed to deliver quality CD services, then translating this into labour demand. This demand could be matched to actual positions to identify gaps, allowing training and education policies to address supply issues. Based on general public health workforce analyses, areas of skills shortages are likely to include: epidemiology and biostatistics, pathologists and laboratory science, public health informatics and information technology, policy and program evaluation.

Recognising that primary and tertiary care operate in challenging environments with complex patient needs, expertise for individual communicable diseases cannot be assumed. The CD control workforce supports front-line health workers to prevent onward spread and provide the best public health management of CD cases, with advice on infection control, management of contacts of illness, prophylaxis, vaccination schedules, and adverse reactions.

What the future looks like

A flexible, well-trained workforce with clear roles and responsibilities built around core competencies, works together to deliver best public health management to patients and the population cost-effectively and continues to build their skills through effective training and team work.

Australia possesses broad human capacity with a wide range of skills such as epidemiology, biostatistics, literature review and critical appraisal, pathology, virology, entomology, health information technology, policy and program development and evaluation, and health risk communications. Clinical care and public health providers are equipped with the skills they need, supported in learning, and able to pass on hard-earned skills to students and new graduates.

Australia has expertise at the highest international levels to foster a knowledge base that allows access to overseas expertise as well as allows the sharing of expertise with developing countries.

Outcome 2.3 Improved information systems and research capacity

Directions for change

Public health decision-making is critically dependent on the timely availability of reliable data. The role of health information systems, including surveillance and laboratory information systems, is to generate, analyse and disseminate such data. Technologies are enablers for change in CD control and support core CD functions of surveillance, including laboratory surveillance.

The key challenge is to address the fragmented nature of surveillance, public health and health system information systems in Australia. Critically, national CD surveillance needs to be more responsive allowing information to be available when and where CD risks threaten population health, and serve jurisdictional and national needs.

Improving information systems underpins improvements in surveillance systems. Robust information technology infrastructure should also improve linkages between different health information systems to enhance the quality, depth and robustness of data analyses and provide more accurate answers to surveillance or research questions. Information sharing policies that uphold privacy principles are essential.

Public health research should also be recognised as an essential source of information for decision-making. Research is essential for improving the performance of public health interventions and cuts across all functions of CD control. Research activities that lead to strategies that minimise the impact of infections are policy relevant and examples include: establishing pathogenesis of infections; developing diagnostic tests; understanding the epidemiology of infectious disease, developing safe and effective vaccines, finding new treatments, discovering new agents and using existing knowledge to ensure strategies are up to date and evidence based.

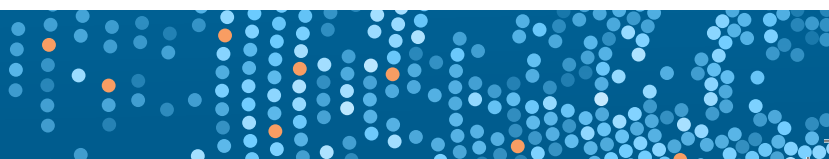
A measure of purposive research co-ordination is required in order to ensure that ongoing information needs are met, and that capacity will remain in place in Australia to meet urgent requirements in the event of a public health emergency. CD control funding bodies need to consider research capacity as a system enabler, rather than a separate function that competes for funding and priority.

Integrated information systems producing 'big data' must be matched with the human capacity and the interpretative tools to turn the information into evidence that supports decision makers. Although there is some capacity for automation, the people who design the systems and tools are the critical link in the pathway between the information and the evidence that supports aspects of CD control.

What the future looks like

National public health teams have accurate and timely information to support best public health management. There is efficient exchange of information between public health authorities, primary health care, community and specialist health care settings. The result is improved quality of CD care, prevention and control.

Research capacity is embedded in functions and processes, supporting surveillance, epidemiological and laboratory investigations, policy design and evaluation, and the translation of information into evidence. Public health decision-makers can depend on the timely availability of reliable data.



Over the longer term, virtual data networks or health information grids allowing real-time exchange of health data by multiple parties could transform the surveillance landscape – highlighting the need for a system prepared for change. Information technology specialists who understand public health processes and requirements identify ways to: share data across different platforms; link new datasets to existing systems; generate algorithms to detect unusual patterns in health events; and display analysed data in an accessible and understandable format. As a result, communicable disease surveillance keeps pace with changes to the way the world captures, stores, transfers, uses and disseminates information.

Outcome 2.4 Adequate financing and infrastructure

Directions for change

The right mix of financial incentives and funding arrangements underpins an effective and responsive CD system. However there remain challenges in quantifying public health expenditure due to changes in funding, and lack of evaluation of cost-effectiveness of CD related public health activities.

Appropriate funding mechanisms are critical to ensure the sustainability of system functions, especially surveillance and laboratory surveillance. Important CD control activities cannot depend on the traditional fee for service model of the healthcare system. Funding pressures are most acute in the laboratory sector where public health activities are supported by diminishing profits from fee for service laboratory testing, with many activities self-supported by laboratories.

Changes to funding arrangements need to support alternative funding mechanisms that better support CD control activities, especially public health laboratory testing, encourage innovation, and respond to jurisdictional and national service gaps. Over time, changes need to be informed by evidence, including increasing consideration of cost-effectiveness and the relative efficiency of different approaches across the spectrum of CD control interventions.

Nationally agreed combinations of block and throughput funding may suit particular activities, providing there is an acknowledged set of outputs related to that funding, with flexibility in funded programs to allow adaptation to meet emerging priorities.

What the future looks like

Financing arrangements build on the strengths of the system, identify and fill national capability gaps and focus on cost-effective interventions. The CD system uses outcomes data and performance information at population, population subgroup, national and jurisdictional levels to understand what works well and where improvements could be made. The system is funded flexibly and adequately achieves sustained improvements in CD prevention.

Outcome 2.5 Effective national partnerships and networks

Directions for change

The ongoing, coordinated, and complementary efforts of many individuals and groups are required to build a strong CD control system that is able to prevent and control endemic diseases and respond to new and emerging threats. All levels of government, non-government agencies, professional organisations, the private sector and the community play a role. There is need to acknowledge partners that represent national organisations dealing with separate jurisdictional CD control authorities, creating additional administrative layers and reducing efficiency.

Strategic partnerships improve collaboration and service delivery, across clinical response, surveillance, laboratory detection, research, policy, or governance, such as operational relationships between agencies or government departments. Partnerships with CD control are the foundation of health sector's capacity to respond to large-scale outbreaks. Health emergency planning recognises that partnerships need to be established well in advance of such events.

The public needs to be recognised as a key partner. Individuals can reduce their likelihood of contracting many infectious diseases by receiving free vaccinations from the National Immunisation Program, adopting protective behaviours and observing safe work practices. Engaging the public and influencing behaviour change is paramount to communicable disease control. While communication is key, the public should be seen as a partner that can help improve the development and successful implementation of disease control policies.

What the future looks like

A national approach to CD control, through adopting a framework, enables a consistent and efficient approach to partnerships. It can be used to:

- Drive improvements across all jurisdictions by partnering with all health departments to improve core CD control functions and address priority CD issues.
- Coordinate with public health, healthcare, and other partners to implement policies that improve the nation's health.
- Engage the non-government sector and the broader community on a national level and help the local government, businesses and community leaders improve local preparedness activities.
- Communicate with the public about the interconnected efforts needed to prevent and control CD and their role in protecting health.

Outcome 2.6 Effective international engagement

Directions for change

The speed and scale of national and international travel means that communicable diseases cannot to be managed within nation states or in jurisdictions within a nation. Effective international engagement is vital to reduce global risks of communicable diseases. Improving national communicable disease control should be an opportunity to improve the organisation of Australia's international health activities, relationships and programs.

The 2005 International Health Regulations (IHR) provide a legal and political framework for detecting and containing outbreaks of international concern. Under the 2005 IHR, all WHO member states (nearly 200 nations) are required to maintain or develop core capacities for disease surveillance, reporting, and response capacity, with industrialized nations providing technical support to less developed nations. Implementation of the 2005 IHR is designed to improve the capacity of all countries to detect, assess, report, and respond to public health threats [6].

The Asia Pacific region has been identified an epicentre for emerging diseases, with potential significant impacts on health, social and economic development. Proactive regional engagement to mitigate potential epidemics is in Australia's national interest. Regional engagement requires Australia to commit more human and other resources to support surveillance, preparedness, prevention and control activities in countries in the Asia-Pacific region.

What the future looks like

With a particular focus in our region, Australia strengthens coordinated support for:

- Bilateral and multilateral initiatives in communicable disease control, especially detection and response to emerging threats, including drug-resistance, pandemic influenza, and bioterrorist events.
- Regional and global communicable disease surveillance networks, such as WHO's Global Outbreak Alert and Response Network (GOARN).

6. Adopting a National Framework

Governance arrangements

The Framework provides an overarching strategic framework for reform.

The Framework provides a sound basis for more detailed planning. National agreement on the Framework objectives and priority areas of work can transform what is currently a disparate collection of interdependent communicable disease control services into a more cohesive system, providing the opportunity to improve cost effectiveness and drive evidence-based public health practice and programs.

National agreement on the objectives and key outcomes areas is necessary to develop action plans identifying specific actions, responsibilities and timeframes for implementation.

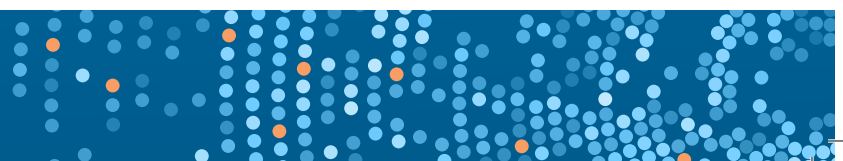
Three to five year action plans could provide a staged approach to achieving the necessary reforms identified within the Framework. They also allow governments to address current and emerging priorities, as resources permit.

The Australian Government and state and territory governments and nongovernment agencies need to commit to working together to develop actions under these plans, implementing key actions and reporting on progress.

Implementation plan

With the agreement on a National Framework for Communicable Disease Control, the Australian Government and state and territory governments will work together to develop an Implementation Plan. The Implementation Plan will focus on the actions agreed to for the first three to five years and will outline their scope, resourcing and timing. The Implementation Plan will be a key tool in measuring progress of the National Framework.

All jurisdictions and stakeholders should be able to monitor progress against activities and milestones outlined in the Implementation Plan. A set of performance indicators developed as part of the Implementation Plan would provide another opportunity to evaluate the Framework, monitor progress and outcomes.



7. A future system of communicable disease control

An integrated, coordinated and resourced CD control system strengthens Australia's capacity to detect, prevent and response to communicable diseases, driving improved health outcomes for the community.

Achieving national coordination and integration is significant and will require support and engagement across all levels of government, the private sector, the community and health professionals.

The implementation of the Framework will include challenges: for the communicable disease control community to adopt new ways of working; for governments to develop new approaches, including to service delivery and aspects of funding; and for consumers to influence and engage with change.

The key initiatives outlined will collectively drive major change across the system. Together, these changes will ensure a strong and effective system capable of protecting Australians from communicable diseases.

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9. Supporting Documents

Two documents informed the development of the Framework.

A. System Overview of Communicable Disease Control in Australia

The System Overview includes a comprehensive overview of current communicable disease control management in Australia, and identification of essential elements and any capability gaps in the system. The System Overview includes:

- A background on communicable disease control in Australia.
- Review of international models of communicable disease control.
- Description of the methods used to develop the overview.
- Brief definition and description of CD control system elements.
- Suggested priority areas for action in Australia.

B. Discussion Paper, Towards a Communicable Disease Control Framework

The Discussion Paper provided information on key issues impacting our current system of communicable disease control, summarising the findings of the system overview. It defined the essential elements underpinning the Australian system as core functions, special national functions and enablers. Within these elements, the paper proposed seven priority areas to strengthen Australia's future communicable disease control system. The Discussion Paper sought input on whether the possible areas for action address the challenges facing national communicable disease control in Australia.

10. Acknowledgements

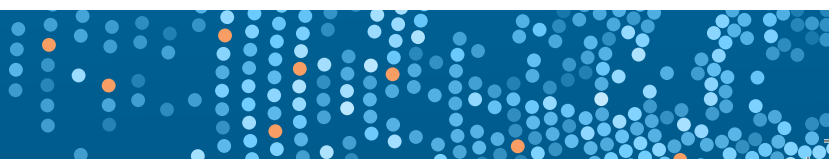
Many individuals and organisations have freely given their time and expertise to the development of the proposed National Framework for Communicable Disease Control. In particular, the Communicable Disease Network Australia wishes to thank all organisations and individuals who provided feedback on the Discussion Paper consultation, as well as those who participated in workshops in 2012. The involvement and willingness of all concerned to share their experience and expertise is greatly appreciated.

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