Managing the risks of biological hazards at work

Code of Practice

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safe work australia

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Foreword

This Code of Practice (Code) on managing the risks of biological hazards at work is an approved code of practice under section 274 of the *Work Health and Safety Act* (the WHS Act).

An approved code of practice provides practical guidance on how to achieve the standards of work health and safety required under the WHS Act and the *Work Health and Safety Regulations* (the WHS Regulations) and effective ways to identify and manage risk.

A code of practice can assist anyone who has a duty of care in the circumstances described in the code of practice. Following an approved code of practice will assist the duty holder to achieve compliance with the health and safety duties in the WHS Act and WHS Regulations, in relation to the subject matter of the code of practice. Codes of practice deal with particular issues and may not cover all relevant hazards or risks. Health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes of practice exist.

Codes of practice are admissible in court proceedings under the WHS Act and WHS Regulations. Courts may regard a code of practice as evidence of what is known about a hazard or risk control and may rely on the code in determining what is reasonably practicable in the circumstances to which the code of practice relates. For further information see the Interpretive Guideline: *The meaning of 'reasonably practicable'*.

Compliance with the WHS Act and WHS Regulations may be achieved by following another method if it provides an equivalent or higher standard of work health and safety than the code.

An inspector may refer to an approved code of practice when issuing an improvement or prohibition notice.

Scope and application

This Code is intended to be used by persons conducting a business or undertaking (PCBUs) and provides practical guidance on how to manage the risks of biological hazards at work.

It applies to all workplaces covered by the WHS Act and WHS Regulations where there is a risk to workers or others of exposure to one or more biological hazards.

This Code may be a useful reference for other persons interested in the duties under the WHS Act and WHS Regulations.

How to use this code of practice

This Code includes references to the legal requirements under the WHS Act and WHS Regulations. These are included for convenience only and should not be relied on in place of the full text of the WHS Act or WHS Regulations. The words 'must', 'requires' or 'mandatory' indicate a legal requirement exists and must be complied with. The word 'should' in this Code indicates a recommended course of action, while 'may' indicates an optional course of action.

1. Introduction

For the purposes of this Code, biological hazards are substances and agents of biological origin, such as from humans, plants and animals, that pose risks to human health. They include viruses, bacteria, parasites, prions and some types of fungi (including mould). They also include allergens, irritants and toxins, such as organic dust, sap and venom.

Biological hazards can be found in all industries and workplaces – including both indoor and outdoor settings. People may be exposed to them at work if biological hazards are:

- *part of the work conducted* (e.g. research laboratories working directly with viruses, healthcare workers in contact with ill patients, farmers handling sick animals and waste management workers processing untreated waste),
- *associated with where the work occurs* (e.g. working outside where there is a high prevalence of mosquitoes, work which involves travelling to areas with endemic tropical diseases and working in indoor spaces with contaminated air or mould growth), or
- *brought into the workplace from the community* by workers and other people who enter the workplace (e.g. communicable diseases such as the common cold, influenza or COVID-19).

Some industries and workplaces are well versed in working with biological hazards as it is part of their core business (e.g. hospitals and regulated biological laboratories) and have established practices in place to manage the associated risks and comply with requirements. For other industries and workplaces, biological hazards may be incidental to their core business (e.g. retail and customer service) and are considered as part of the broader risk management processes. Further information on the risk management process is provided in **Chapter 3**.

Regardless of your specific industry or workplace, you must always aim to ***eliminate*** risks. Given the nature of biological hazards, elimination may not be possible for many workplaces. If you are not reasonably able to eliminate risks, you must ***minimise*** the risks as much as you reasonably can. A checklist that summarises the key considerations when managing the risks of biological hazards in your workplace can be found at **Appendix A** and a glossary defining key terms can be found at **Appendix B**.

While the types of biological hazards vary widely and the control measures that can be implemented to manage risks will depend on your particular workplace, exposure to some biological hazards can be effectively managed with baseline control measures. Baseline control measures include:

- ensuring good air quality, including through ventilation and air cleaning (see **Appendix C** for further information)
- implementing routine cleaning and proper waste management processes (see **Appendix D** for further information)
- training workers on good hygiene practices, including cleaning hands (see **Appendix E** for further information)
- encouraging vaccination for vaccine preventable diseases that may be present in your workplace (see **Appendix F** for further information)
- training workers on potential biological hazards and control measures in place to manage risks, and

- providing workers with suitable personal protective equipment (PPE) (see **Appendix G** for further information).

Implementing baseline control measures is important even if you are undertaking further work to determine specific risks in your workplace (e.g. testing to identify which biological hazards are present) as they will provide some protection to workers.

Some workplaces will have specific risks arising from biological hazards which may require additional control measures to be implemented, such as workplaces where higher risk activities are conducted. For example, cleaning spills of body substances in a hospital setting will require the use of specialised products, cleaning techniques and adherence to strict infection prevention and control standards. Similarly, manufacturing processes which generate large amounts of organic materials (e.g. textile dust in a factory) may require air monitoring and specific mechanical ventilation.

This Code provides practical guidance to assist you in identifying, and implementing, the most effective ways to manage the risks arising from biological hazards in your workplace and meet your duties under WHS laws (see **Chapter 2** for further information). The Code should be considered alongside other laws which apply to biological hazards and any existing detailed standards and guidance on specific matters relevant to your industry or workplace (see **Section 2.6** for further information).

Case studies in blue boxes throughout the Code provide examples of biological hazards that exist in Australian workplaces and the control measures which can be implemented to manage risks. These examples are not exhaustive, however, the principles outlined in this Code can be applied to other biological hazards which may be present in your workplace.

While the information and examples provided in this Code are largely focussed on workers, you should consider how it applies to other people who may be exposed to biological hazards in your workplace or through your work activities.

1.1 Where can biological hazards be found in the workplace?

The source of a biological hazard is the material or environment in which it is found, as depicted in **Figure 1**. In the workplace this could be:

- **another person** (e.g. workers, customers, clients and patients) - workers may be exposed to biological hazards such as viruses and bacteria from other people. Where a worker is infected with a biological hazard that is transmissible to other people, then they are also a potential source
- **an animal** (e.g. cattle, sheep, pigs, birds, bats, dogs, cats, pests, horses, spiders, reptiles, and marine animals such as jellyfish) - workers may be exposed to biological hazards such as viruses, bacteria, parasites, fungi, venom and allergens from contact with animals
- **human or animal biological material** (e.g. blood, faeces, manure, urine, saliva, mucus, semen, carcasses and birth products) - workers may be exposed to biological hazards such as viruses, bacteria and parasites from contact with human or animal biological materials
- **a vector** (e.g. mosquitoes, ticks, fleas, mites and cockroaches) - some vectors can spread bacteria, viruses and parasites between humans, or from animals to humans (i.e. zoonotic diseases)

- **contaminated material** (e.g. surfaces, objects, soil, dust, water, air, food, and waste) - workers may be exposed to biological hazards such as viruses, bacteria, mould and parasites when working directly with contaminated materials (e.g. compost, mulch or sewage) or in different environments containing contaminated materials (e.g. working near cooling towers or in water damaged buildings with mould growth)
- **organic material** – workers may be exposed to biological hazards, such as allergens and irritants, when working with organic dusts (e.g. cotton, grain, wood, flour and hay dust) which contain materials that originate from plants or animals. These organic dusts may become airborne when disturbed. Certain plant materials (e.g. plant cultures, sap and debris) may also become hazardous when they enter the body or come into direct contact with the skin and trigger an immune response (e.g. allergies, irritation and inflammation).

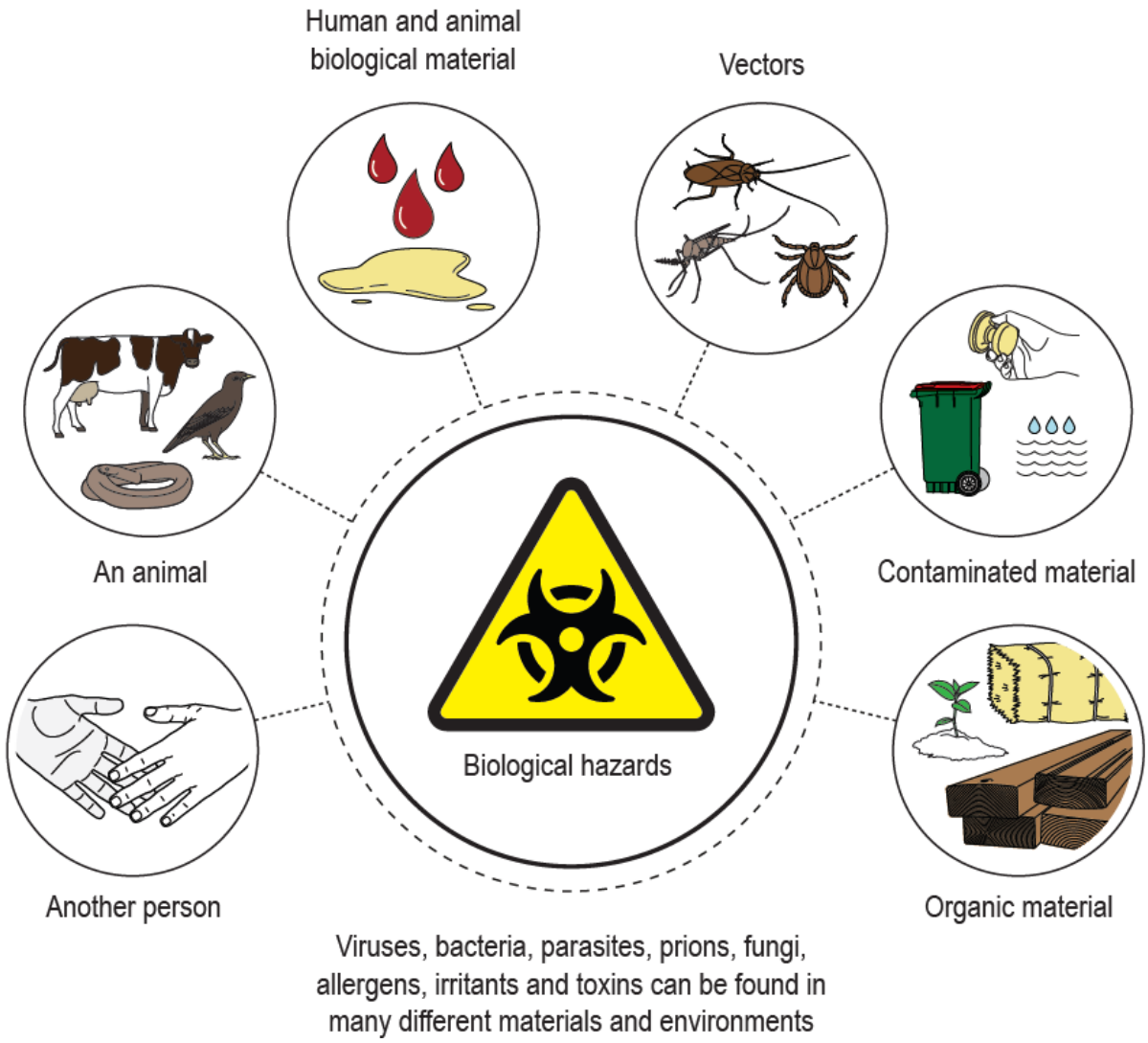

Figure 1: Graphic depicting the sources of biological hazards

Many biological hazards are not visible to the eye and may require testing to identify them.

You may have more than one biological hazard source at your workplace depending on the type of workplace and work activities being undertaken. You should consider what biological hazards exist in the context of the whole workplace, as hybrid working environments (e.g. combined office and frontline spaces) can present different or overlapping biological hazard sources. You should also consider where work is undertaken, for example, if workers perform work in different locations.

The effects of climate change contribute to the intensity, frequency and duration of some biological hazard sources in the workplace. For example, extreme weather events (e.g. heat, rain and flooding) can exacerbate the growth of mould, increase populations of disease carrying vectors (e.g. mosquitoes) and increase the risk of workers being exposed to water and food-borne biological hazards (e.g. bacteria, viruses and parasites).

Certain occupations are more likely to be exposed to certain sources of biological hazards. **Appendix H** provides examples of occupations that may have higher risk of exposure to biological hazards because they involve:

- intentional contact with microorganisms
- contact with persons or human blood and body substances
- contact with animals and animal blood, body substances, products, hides, skins, wool or hair
- contact with human or animal waste
- contact with contaminated sharps
- contact with contaminated material, including environments, soil, equipment, surfaces and substances, or
- contact with vectors.

The below case studies provide examples of potential biological hazards and sources. The case studies continue in sections 1.2 and 1.3 to illustrate how workers may be exposed to biological hazards and the harm they can cause. **Table 1** provides further examples which may assist you to identify risks to workers in your workplace.

Case study 1 – Truck driver

Due to recent heavy rainfall, the truck Ken has been driving in the field is muddy. Before locking the truck away overnight in his workplace's storage shed, he hoses it down with water from the rainwater tank.

In this scenario, Ken has contact with two sources which may contain biological hazards. The untreated water from the rainwater tank may be contaminated with biological hazards, such as bacteria and parasites. There is also a risk the water may be contaminated with other hazardous materials, such as bird droppings or dead animals and insects. The mud on the truck may be contaminated with biological hazards, such as bacteria and mould.

Case study 2 – Environmental scientist

Mahommed is an environmental scientist collecting soil samples outside in a dense grassy area in a remote location.

In this scenario, Mahommed has contact with two sources which may contain biological hazards. The area likely contains vectors, such as ticks and mosquitoes, that may carry disease, as well as materials contaminated with biological hazards, such as animal waste and soil.

Case study 3 – Early childhood educator

Hannah is an early childhood educator working in the nursery area at a childcare centre. She is responsible for providing care, learning and support for several children aged from 6 weeks old to 2 years.

In this scenario, Hannah has contact with three sources which may contain biological hazards - the children, the children's biological material (e.g. faeces and vomit) and contaminated materials (e.g. surfaces and objects in the childcare centre).

1.2 How are workers exposed to biological hazards at work?

To cause harm, a worker must be exposed to a biological hazard, as depicted in **Figure 2**. A worker may be exposed to a biological hazard through:

- **person to person contact**, such as intentional or unintentional physical contact with a person infected with a communicable disease or via sexual transmission
- **animal to person contact**, such as physical contact with animals infected with zoonotic diseases
- **plant to person contact,** such as physical contact with plant material which is known to trigger an immune response in people
- **contact with human biological material**, such as contact with blood and body substances (e.g. faeces, semen, mucus and saliva)
- **contact with animal biological material,** such as contact with saliva, urine, faeces, dander, hides, skins, wool, feathers and hair

- **a penetrating injury** caused from interaction with people, animals, the environment or objects which allow a biological hazard to enter the bloodstream, such as scratches, bites, stings, wounds (cuts and abrasions) or sharps injuries
- **transmission through the air**, including:
    - contaminated dust, water or air, such as indoor environments contaminated with airborne mould spores or Legionella bacteria
    - organic dust, such as dust generated through woodworking, food processing, textile manufacturing and handling plant-based materials
    - respiratory particles, such as those generated through coughing, sneezing, talking, singing and breathing
    - splashes and sprays of body substances, such as those generated through vomitus and spitting
- **vector transmission**, such as through mosquitoes, ticks, fleas or mites
- **contact with contaminated materials**, such as physical contact with surfaces (e.g. desks and door handles), objects (e.g. devices or tools), soil, waste, water (e.g. floodwater or dirty drinking water) and food.

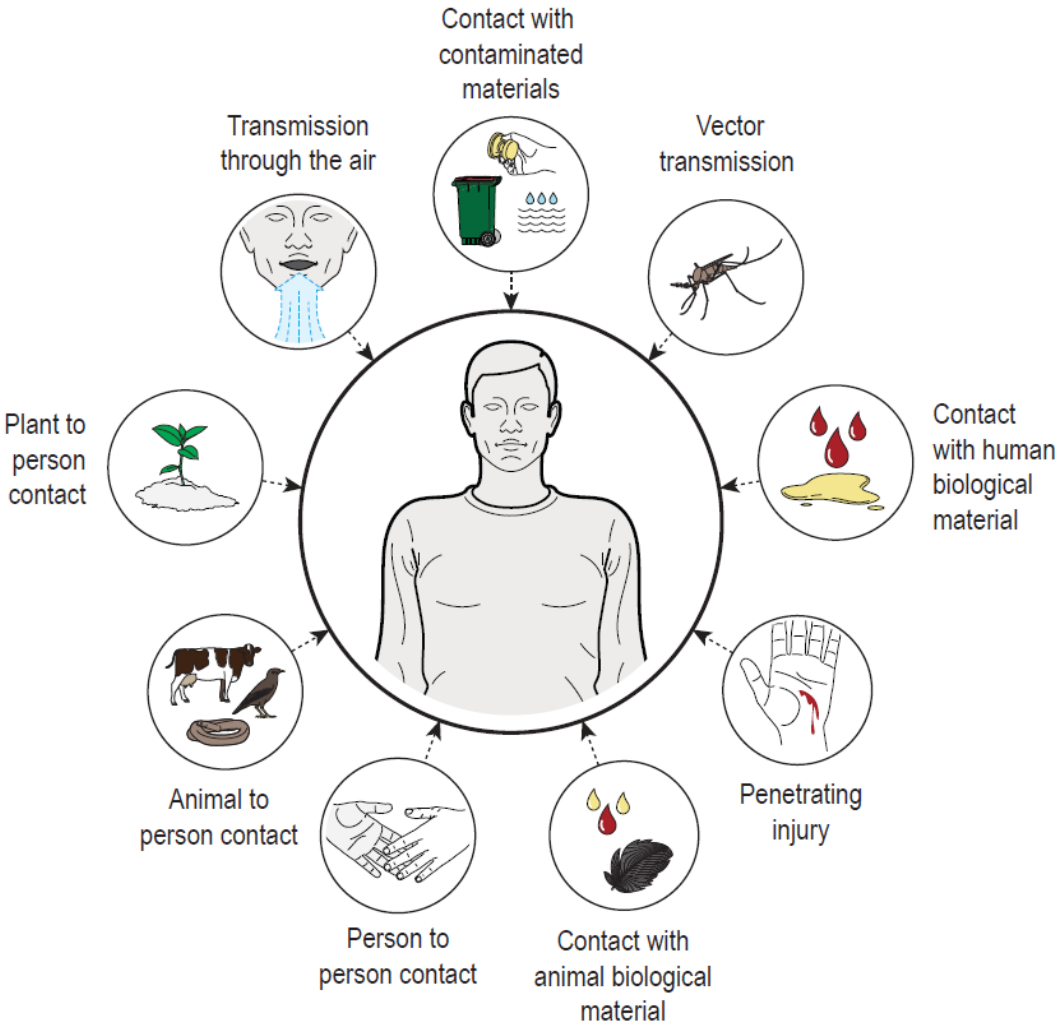

Figure 2: Graphic depicting how workers are exposed to biological hazards

Workers can be exposed to biological hazards in more than one way. For example, gastrointestinal infections can be spread through direct contact with an infected person, breathing in contaminated air and contact with contaminated materials (e.g. phones and lift buttons) and then touching the nose or mouth.

Understanding how workers are exposed to biological hazards can assist you to identify possible control measures to manage risks. **Appendix I** provides examples of control measures grouped according to how people are exposed.

Biological hazards can be:

- communicable – meaning they can spread to a person from another person or animal, such as the viruses which cause measles and gastroenteritis, or
- non-communicable – meaning they only affect the person who was exposed and that person cannot spread the biological hazard further, such as organic dust exposure resulting in chronic obstructive pulmonary disease (COPD), certain bacterial infections (e.g. tetanus and Legionnaire's disease) and mosquito borne diseases (e.g. dengue fever).

Biological hazards can enter the body in different ways, as depicted in **Figure 3**. This includes through:

- inhalation
- ingestion
- contact with the eyes, nose, ears, mouth or skin, and
- broken or damaged skin, such as from a sharps injury, bite, puncture wound, scratch, cut, abrasion or dermatitis.

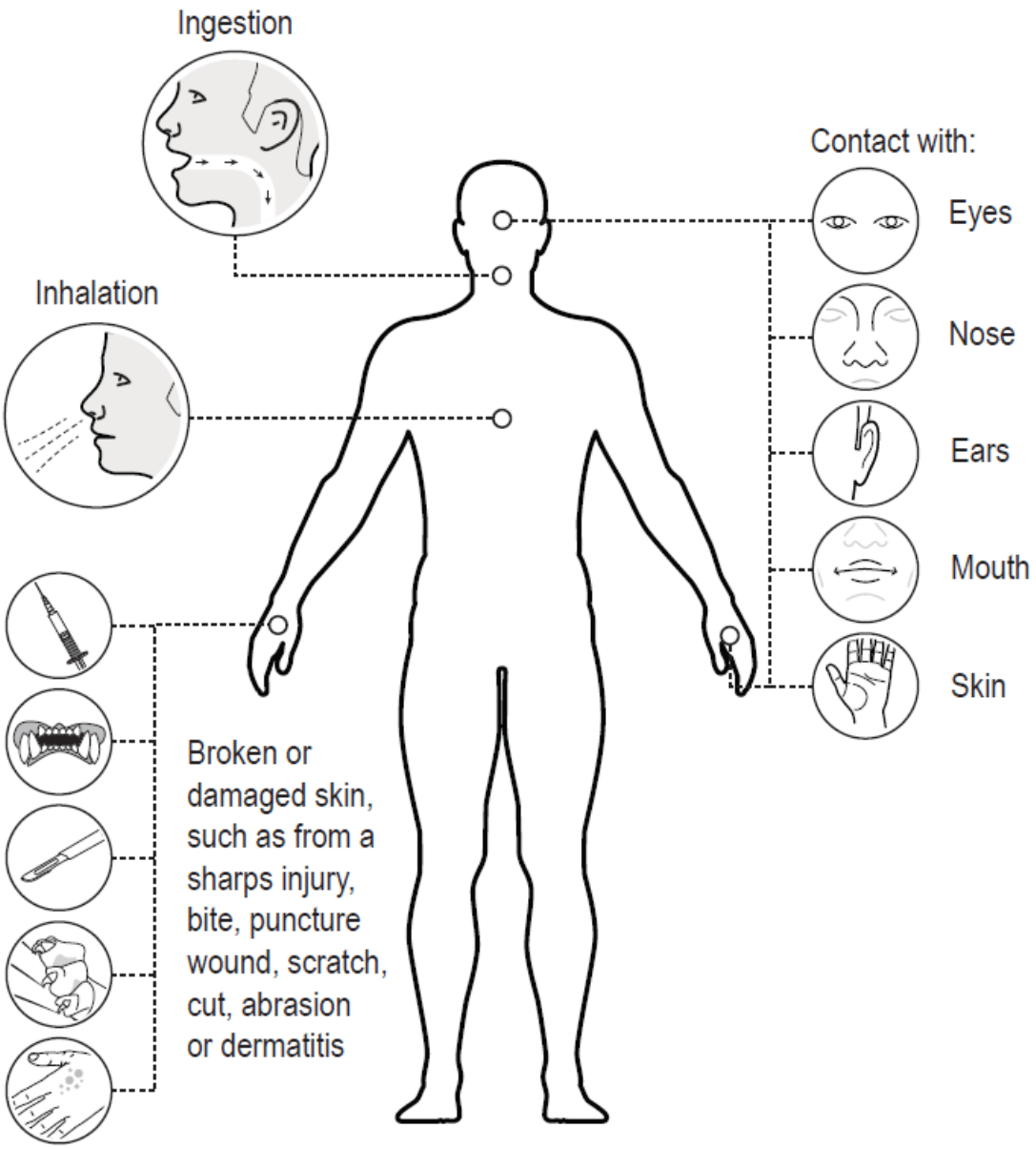

Figure 3: Graphic depicting how biological hazards enter the body

The below case studies illustrate how workers may be exposed to biological hazards.

Case study 1 (continued) – Truck driver

Ken is hosing down his muddy truck with untreated water from the rainwater tank. He is being exposed to biological hazards which may be present in the untreated rainwater and in the mud. As Ken sprays down the truck, untreated rainwater is released into the air creating a mist, which Ken then breathes in. The water pressure also flicks particles of mud from the truck which land on Ken's clothes and body. Ken doesn't change out of his dirty clothes, or shower before leaving work, and gets mud in his car and home.

Case study 2 (continued) – Environmental scientist

While getting ready to commence his work collecting soil samples, Mahommed realises he has forgotten to pack insect repellent and is not wearing appropriate protective clothing. Noting it would take a long time to source these items he decides to commence the work without them and is subsequently bitten by mosquitoes. After taking a short break to have a drink he forgets to put his gloves back on and gets dirt on his hands. There are no handwashing facilities available, so he rubs his hands on his clothes before putting his gloves back on. After he finishes his work, he rubs his eye before he has a chance to thoroughly clean his hands.

Case study 3 (continued) – Early childhood educator

There is an outbreak of gastroenteritis at a childcare centre and Hannah is exposed to vomit and diarrhoea through contact with the sick children she is caring for, splashes and sprays of vomitus in the air, and contact with surfaces (e.g. change tables) which haven't been properly cleaned.

1.3 How can biological hazards cause harm?

Exposure of a worker or other person at the workplace to biological hazards can result in injury, illness and disease. This includes infectious diseases (e.g. Q fever and bloodborne viruses), respiratory conditions (e.g. occupational asthma and hypersensitivity pneumonitis from mould spores or organic dusts), neurological and cognitive harm (e.g. from Hendra virus and Japanese encephalitis), allergic reactions or irritation (e.g. from animal dander or plant materials) and skin infections (e.g. scabies and tinea). It can also cause broader social and economic consequences (e.g. increased burden on caregivers and productivity costs for workers) especially where symptoms persist (e.g. Ross River virus where a person can be unwell for weeks or months).

Depending on what the biological hazards are and the individual's susceptibility to illness, the consequences of an exposure can range from mild to severe, and in some cases can even be fatal. People who are more vulnerable to severe illness after an exposure to a biological hazard (e.g. people with pre-existing medical conditions, infants, the elderly and people who are immunocompromised) may require additional control measures to ensure risks are effectively managed for them. This should be considered as part of undertaking a risk assessment. Further information on people at higher risk of severe harm can be found in **Section 5.2**.

Some biological hazards have the potential to rapidly spread with far-reaching impacts within workplaces and the broader community. For example, the virus which causes COVID-19 can spread easily from person to person and the health effects can vary from no symptoms or mild illness for some people to serious harm (e.g. long-term health impacts) and death for others.

Some biological hazards only affect the person who is initially exposed to them, however, the harm to that individual can be immediate and significant (e.g. severe acute illness following a snake bite).

Some biological hazards cause harm after repetitive, long-duration exposure and the impact on the individual can be gradual. For example, a worker who develops chronic bronchitis after long term exposure to grain dust or mould.

Workers who are exposed to biological hazards may also experience anxiety and stress. Further information is provided in the psychosocial hazards section below.

The below case studies illustrate how biological hazards can harm workers.

Case study 1 (continued) – Truck driver

Ken is at risk of contracting an illness (e.g. leptospirosis) from the muddy water mist he breathed in at work. He may have also put others at risk by not showering and putting on clean clothes before leaving work.

Case study 2 (continued) – Environmental scientist

Mahommed is at risk of contracting an illness (e.g. Ross River virus) from the mosquito bite, or an infection (e.g. conjunctivitis) from the soil he rubbed in his eye.

Case study 3 (continued) – Early childhood educator

Hannah is at risk of contracting an illness (e.g. gastroenteritis) from contact with a sick child's vomit and diarrhoea.

Psychosocial hazards

Biological hazards, or control measures implemented to manage them, can also contribute to psychosocial hazards. A psychosocial hazard is anything that could cause psychological harm (e.g. harm someone's mental health). Common psychosocial hazards at work are depicted in **Figure 4**.

Some of the psychosocial hazards associated with biological hazards include:

- a hazardous work environment contaminated with biological hazards (e.g. blood, vomit and faeces) and sharps (e.g. needles and scalpels)
- traumatic events or material (e.g. contact with patients who are very ill with a communicable disease or have sustained a catastrophic injury), and
- violence and aggression (e.g. being bitten or scratched, and sharps injuries).

For example, workers may experience:

- anxiety of contracting an illness (e.g. a respiratory or blood-borne disease) or spreading illness to others – which is increased if they are immunocompromised or living with people who are, or
- stress while waiting for test results to see if they have been infected following an exposure or potential exposure, or if they are required to take medication with potentially significant side effects following an exposure.

These risks to the worker can be increased where there are other psychosocial hazards present, for example:

- there is poor support – such as if they are not provided with appropriate control measures (e.g. PPE), or not provided with proper information, training and instruction on the control measures being used to manage risks, or
- there are high job demands – such as if they are not given enough time to implement control measures.

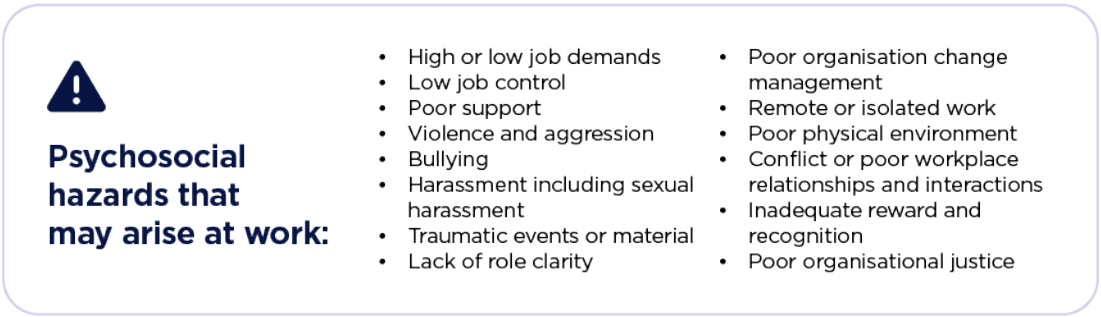

Figure 4: Examples of common psychosocial hazards at work

Control measures can sometimes introduce new psychosocial hazards or increase the risks of existing hazards. You will need to identify these risks when making decisions about how to control the risks associated with biological hazards.

For information on psychosocial hazards see the Code of Practice: *Managing psychosocial hazards at work*.

Table 1: Examples - Sources, biological hazards, exposures and potential harm

Example[1]	Source	Biological hazard	How the worker is exposed	Potential harm
A nail salon worker holds a customer's hands and feet when doing their nails during an appointment. The skin on the customer's hands and feet has patches of red blisters	Another person: the client	Parasites or fungi	Person to person contact: Exposure to parasites or fungi through direct skin-to-skin contact	The nail salon worker may develop a skin infection, such as scabies or tinea pedis (athlete's foot)
A worker in an aged care facility assists a resident with dementia with feeding and hygiene tasks in close proximity. The resident coughs several times on the worker	Another person: the resident	Bacteria or virus	Transmission through the air: Exposure to bacteria or virus through inhalation of contaminated air	The worker may develop a respiratory infection, such as pertussis (whooping cough), the common cold or COVID-19
A police officer is scratched by a person during an arrest	Another person: the person	Bacteria	Penetrating injury: Exposure to bacteria via broken skin caused by the scratch	The police officer may contract a staph infection
A sex worker experiences a condom breakage with a client	Another person: the client	Bacteria, virus or parasites	Person to person contact: Exposure to bacteria, virus or parasites through direct skin-to-skin contact and contact with human biological material	The sex worker may contract a sexually transmitted infection, such as chlamydia, gonorrhoea, syphilis, human immunodeficiency virus (HIV), human papillomavirus, herpes simplex virus or trichomoniasis

[1] **Note:** Table 1 is not intended to be exhaustive. It includes a range of examples to assist you to understand how workers might be exposed and the type of harm that could occur. It does not include every possible source, biological hazard, type of exposure and potential harm for the described scenario.

Table 1: Examples - Sources, biological hazards, exposures and potential harm

Example[1]	Source	Biological hazard	How the worker is exposed	Potential harm
A customer sneezes directly on a checkout operator at a supermarket	Another person: the customer	Virus	Transmission through the air: Exposure to a virus through inhalation of contaminated air	The checkout operator may contract a highly contagious virus, such as seasonal influenza or respiratory syncytial virus (RSV).
A wildlife worker is bitten by a bat when trying to untangle it from bird netting	An animal: the bat	Virus	Penetrating injury: Exposure to a virus via broken skin caused by the bite	The wildlife worker may contract a virus, such as Australian bat lyssavirus
A vet examines a sick horse's mouth while not wearing a mask or protective eyewear	An animal: the horse	Virus	Animal to person contact: Exposure to the virus through infected respiratory secretions entering eyes, nose or mouth	The vet could be exposed to a virus, such as Hendra virus
A farmer is wearing unsuitable gloves when assisting a cow delivering a calf. One of the gloves rips and they get the cow's blood and birth products on a cut on their hand	An animal: the cow	Bacteria	Contact with animal biological material: Exposure to bacteria through broken skin	The farmer may contract a bacterial infection, such as anthrax or Q fever
An animal trapper accidentally cuts themselves with a knife when slaughtering a wild pig caught in a trap	An animal: the wild pig	Bacteria	Contact with animal biological material: Exposure to bacteria through broken skin caused by a puncture wound	The animal trapper may contract a bacterial infection, such as brucellosis
A pest control worker is bitten by a rat when checking a trap in a customer's home	An animal: the rat	Bacteria	Penetrating injury: Exposure to bacteria via broken skin caused by the bite	The pest control worker may contract a bacterial infection, such as rat-bite fever

Table 1: Examples - Sources, biological hazards, exposures and potential harm

Example[1]	Source	Biological hazard	How the worker is exposed	Potential harm
A surveyor is bitten by a brown snake whilst working on land with long grass	An animal: the snake	Toxins	Penetrating injury: Exposure to venom (a type of toxin) via broken skin caused by the bite	The venom may cause the surveyor to experience paralysis, cardiac problems and kidney damage
A passenger vomits in a taxi. The driver cleans it up without wearing suitable PPE and washing their hands thoroughly after cleaning	Human or animal biological material: the passenger's vomit	Virus	Contact with human biological material: Exposure to a virus via ingestion of vomit on hands	The taxi driver may contract a virus, such as norovirus or rotavirus
A laboratory worker stabs their finger while cleaning a piece of equipment. The equipment has been used to analyse tissue from a research animal infected with a disease caused by prions	Human or animal biological material: the animal tissue	Prions	Penetrating injury: Exposure to prions through broken skin caused by a puncture wound	The worker may contract a prion disease, such as Creutzfeldt-Jakob disease (CJD)
A volunteer at an animal shelter has recently started wheezing while cleaning animal cages using a high-pressured hose	Human or animal biological material: the animal dander	Allergens	Transmission through the air: Exposure to allergens through inhalation of animal dander which has been aerosolised during cleaning	The pet shop worker may develop a respiratory illness, such as occupational asthma
A worker in a cat café cleans up contaminated cat faeces and does not wash their hands thoroughly before eating	Human or animal biological material: the cat faeces	Parasites	Contact with animal biological material: Exposure to parasites through ingestion	The cafe worker may develop a parasitic infection, such as toxoplasmosis

Table 1: Examples - Sources, biological hazards, exposures and potential harm

Example[1]	Source	Biological hazard	How the worker is exposed	Potential harm
A volunteer conservation worker undertaking wildlife monitoring discovers a dead kangaroo. The volunteer handles the kangaroo carcass and then rubs their eyes and nose before washing their hands	Human or animal biological materials: the kangaroo carcass	Bacteria	Contact with animal biological material: Exposure to bacteria through direct contact with eyes and nose	The volunteer may develop a bacterial infection, such as Q fever or salmonellosis
A hotel cleaner is pricked by a used needle discarded in a hotel guest's bed linen	Human or animal biological material: hotel guest's blood	Virus	Penetrating injury: Exposure to a virus via broken skin caused by the sharps injury	The hotel cleaner may contract a bloodborne virus, such as human immunodeficiency virus (HIV), hepatitis B or hepatitis C
A greenskeeper inhales dust when mowing grass containing kangaroo droppings	Human or animal biological material: the kangaroo droppings	Bacteria	Transmission through the air: Exposure to bacteria via inhalation of contaminated dust	The greenskeeper may contract a bacterial infection, such as Q fever
A worker in a storage shed discovers a mouse nest and cleans it out. They do not wash their hands afterwards and touch their eyes, nose and mouth	Human or animal biological material: mouse droppings, urine and	Virus or bacteria	Contact with animal biological material: Exposure to virus or bacteria through direct contact with the eyes, nose or mouth	The worker may contract a viral disease, such as hantavirus, or bacterial infection, such as salmonellosis

Table 1: Examples - Sources, biological hazards, exposures and potential harm

Example[1]	Source	Biological hazard	How the worker is exposed	Potential harm
	saliva in the nest			
A fruit picker at an orchard close to irrigation systems and stagnant water is bitten by mosquitoes	Vector: the mosquitoes	Virus	Vector transmission: Exposure to a virus through broken skin caused by the bites	The fruit picker may contract a viral infection such as, dengue fever, Ross River virus, Murray Valley encephalitis or Japanese encephalitis virus
An environmental scientist taking samples in scrubland is bitten by a tick	Vector: the tick	Bacteria	Vector transmission: Exposure to the bacteria through broken skin caused by the bite	The environmental scientist may contract a bacterial infection, such as Australian spotted fever or Queensland tick typhus, or a mammalian meat allergy
An upholstery cleaner is exposed to dust mites when cleaning old furniture	Vector: the dust mites	Allergens	Vector transmission: Exposure to allergens through direct skin contact	The cleaner may develop a skin sensitivity to dust mites
An apprentice at a building site is wearing inappropriate shoes and steps on a nail which pierces through the shoe and into their foot	Contaminated material: the nail	Bacteria	Penetrating injury: Exposure to bacteria on the nail through the puncture wound caused by the nail	The apprentice may develop a bacterial infection, such as tetanus
An animal transporter is cleaning his truck after transporting a load of sheep. They have an uncovered wound on their hand and pick up some loose wool without wearing gloves	Human or animal biological material: the wool	Virus or fungi	Contact with animal biological material: Exposure to a virus through broken skin	The animal transporter may develop as viral skin infection, such as orf virus or ringworm

Table 1: Examples - Sources, biological hazards, exposures and potential harm

Example[1]	Source	Biological hazard	How the worker is exposed	Potential harm
As part of conducting a sensory evaluation a food scientist eats a new product containing eggs and seafood	Contaminated material: the food product	Bacteria, virus and allergens	Contact with contaminated material: Exposure via ingestion	The food scientist may develop a bacterial infection, such as salmonella or cholera, a viral infection such as hepatitis A if the product was not prepared properly, or they could have an allergic reaction to the eggs or seafood
A landscaper cuts their hand while pruning a hedge and doesn't cover the wound. At the end of the workday, they pack their gardening tools into their truck and get soil on the open wound	Contaminated material: the soil	Bacteria	Contact with contaminated material: Exposure to contaminated soil through broken skin	The landscaper may develop a bacterial infection, such as melioidosis or tetanus
An accountant works in a building with a poorly maintained air conditioning system. On hot days the air conditioning system is turned on and aerosolised water is dispersed through the office	Contaminated material: the water	Bacteria	Transmission through the air: Exposure to bacteria through inhalation of contaminated water droplet	The accountant may develop a lung infection, such as Legionnaire's disease
A tradesperson, who suffers from asthma, undertakes work in a poorly ventilated roof space and disrupts dust	Contaminated material: the air	Allergens	Transmission through the air: Exposure to allergens through inhalation of contaminated air	The tradesperson may have their existing asthma exacerbated

Table 1: Examples - Sources, biological hazards, exposures and potential harm

Example[1]	Source	Biological hazard	How the worker is exposed	Potential harm
containing animal dander and droppings				
A technician cleaning a mouldy air conditioner filter releases spores into the air	Contaminated material: the air	Fungi	Transmission through the air: Exposure to fungi (mould spores) through inhalation of contaminated air	The technician may develop a respiratory irritation or have an allergic reaction
A farm worker sweeps a horse stable using a broom and no water	Contaminated material: the air	Bacteria	Transmission through the air: Exposure to bacteria through inhalation of air contaminated with horse biological material	The farm worker may develop a bacterial disease, such as leptospirosis
A council worker is pricked by a thorn in plant debris they are removing from a local park and damages their skin	Contaminated material: the thorn on the plant debris	Fungi	Penetrating injury: Exposure to fungi through broken skin	The council worker may develop a fungal skin infection, such as sporotrichosis
An apprentice chef undertaking training in a shared kitchen uses cutlery which hasn't been cleaned properly	Contaminated material: the cutlery	Virus or bacteria	Contact with contaminated material: Exposure to a virus or bacteria through direct contact with mouth and skin	The apprentice may develop a viral infection, such as adenovirus, hand, foot and mouth disease or a cold score, or a bacterial infection such as strep throat
A seasonal farm worker lives in worker accommodation where the bathrooms are not adequately cleaned. They touch a contaminated surface and then their face	Human or animal biological material: human urine and faeces	Virus or bacteria	Contact with human biological material: Exposure to a virus or bacteria through direct contact (via hands) with eyes, nose or mouth	The worker may develop a gastrointestinal disease such as gastroenteritis

Table 1: Examples - Sources, biological hazards, exposures and potential harm

Example[1]	Source	Biological hazard	How the worker is exposed	Potential harm
before cleaning their hands				
An aquaculturist cuts their hand while working at a fishery	Contaminated material: the water	Bacteria	Contact with contaminated material: Exposure to bacteria through broken skin	The fisherman may develop a bacterial infection, such as Vibrio vulnificus
While deployed to a disaster recovery centre, an emergency services volunteer drinks water which has been contaminated with floodwater	Contaminated material: the water	Viruses and parasites	Contact with contaminated material: Exposure to viruses or parasites through ingestion of contaminated water	The volunteer may develop a viral infection, such as hepatitis A, or parasitic infection, such as giardia
A plumber with damaged skin on their hands undertakes repair work on a sewer pipe	Contaminated material: the sewage	Bacteria	Contact with contaminated material: Exposure to bacteria through damaged skin on their hands	The plumber may develop a skin infection, such as staphylococcus
A remediation worker is cleaning up a contaminated worksite where a sewage backflow issue has occurred and is not provided with appropriate PPE	Contaminated material: the sewage	Virus, bacteria or parasites	Contact with contaminated materials: Exposure to a virus, bacteria or parasites through contact (via hands) with the mouth, eyes and nose	The remediation worker may develop a viral infection, such as norovirus or hepatitis A, a bacterial infection such as salmonella, or parasitic infection, such as cryptosporidiosis
A student undertaking work experience at a florist handles numerous plants without wearing gloves	Organic material: plants	Irritants	Plant to person contact: Exposure to irritants through direct contact with skin	The work experience student may develop skin irritation from contact with plants, such as contact dermatitis

Table 1: Examples - Sources, biological hazards, exposures and potential harm

Example[1]	Source	Biological hazard	How the worker is exposed	Potential harm
A stockperson breathes in hay dust when feeding livestock on a farm	Organic material: hay dust	Allergens	Transmission through the air: Exposure to allergens through inhalation of hay dust	The stockperson may develop an allergy to the hay dust, such as hypersensitivity pneumonitis
A baker breathes in flour dust over several years	Organic material: flour dust	Allergens	Transmission through the air: Exposure to allergens through inhalation of flour dust	The baker may develop a chronic lung condition, such as asthma
A grain handler repeatedly breathes in grain dust while unloading grain from trucks	Contaminated material: grain dust	Fungi	Transmission through the air: Exposure to fungal spores through inhalation of grain dust	The grain handler may develop chronic pulmonary obstructive disease (COPD) as a result of the lung inflammation and damage caused by a hypersensitive reaction to the grain dust
A sugar mill factory worker breathes in sugar cane dust while operating machinery	Organic material: sugar cane dust	Allergens	Transmission through the air: Exposure to allergens through inhalation of sugar cane dust	The sugar mill factory worker may develop a lung disease, such as bagassosis
A tour guide is taking tourists on a bush walk and their bare arms brush against a stinging tree	Organic material: stinging hairs on the tree	Toxins	Plant to person contact: Exposure to toxins through direct skin contact with stinging hairs on the tree	The tour guide may experience intense pain and skin irritation

2. Work health and safety duties

2.1 Persons conducting a business or undertaking (PCBU)

WHS Act section 19
Primary duty of care

WHS Regulation 41
Duty to provide and maintain adequate and accessible worker facilities

As a PCBU, you have a primary duty of care for the health and safety of workers and other persons at the workplace. This requires you to ensure, so far as is reasonably practicable, the health and safety of workers and other persons is not put at risk from the work carried out by your business or undertaking. This includes the risk of exposure to biological hazards.

What risks arising from biological hazards must I manage?

As a PCBU you have a duty to manage the risks to workers arising from biological hazards in your workplace and/or where your work activities are undertaken. For example, a farmer has dairy cows on their farm and requires workers to handle the animals and their biological materials (e.g. milk) as part of their duties at work. In this case, the PCBU would have a duty to manage the risks arising from biological hazards the worker may be exposed to when handling the animals and their biological materials, such as the bacteria which cause leptospirosis. This could include isolating animals who have a suspected or confirmed case of an infectious disease, providing education and signage on potential biological hazards and the control measures in place to manage risks, ensuring workers are provided with hand washing facilities and providing suitable PPE.

There are circumstances where risks arising from biological hazards exist outside your workplace and/or where your work activities are undertaken. For example, a tradesperson buys lunch from a local café while on their lunch break. That afternoon, they begin to feel nauseous and develop a stomach bug even though they had used the hand sanitiser provided in the work vehicle prior to eating. In this case, the PCBU did not have a duty to manage the risk arising from the biological hazard, as the exposure occurred outside of the workplace and/or work activities.

The primary duty of care includes ensuring, so far as reasonably practicable, the:

- provision and maintenance of a work environment without risks to health and safety
- provision and maintenance of safe plant and structures
- provision and maintenance of safe systems of work
- safe use, handling and storage of plant, structures and substances
- provision and maintenance of adequate and accessible worker facilities

- provision of any information, training, instruction or supervision that is necessary to protect all persons from risks to their health and safety
- monitoring of the health of workers and the conditions of the workplace for the purpose of preventing illness or injury, and
- maintenance of any accommodation owned or under your management and control to ensure the health and safety of workers occupying the premises.

Facilities and accommodation

As a PCBU, you must provide adequate and accessible facilities for workers, including toilets, drinking water, and facilities for washing and eating. These facilities must be maintained so they are in good working order and are clean, safe and accessible. For example, bathrooms should be well ventilated, regularly cleaned and stocked with soap and hand drying facilities so workers can practice good hygiene. Inadequate, poorly maintained, poorly ventilated or unclean facilities can be a source of a biological hazard and can spread biological hazards between people.

When determining the facilities your workplace needs, you will need to consider the number of people in the workplace, any shift arrangements, worker movements through the workplace and when access to those facilities is needed. Consideration must also be made for how workers who work remotely or in the community will access facilities while they are working, as well as what resources those workers will need. For example, where will homecare workers store their food and eat (at the worksite or offsite) and where will they use the toilet and wash their hands (in a client's house or a public toilet)?

If a business has workers working in regional and remote areas, accommodation may need to be provided while the work is being carried out. For example, accommodation provided to fruit-pickers during the harvesting season or shearers on a sheep station. If you provide accommodation for workers, you must, so far as is reasonably practicable, maintain the premises so that the worker occupying it is not exposed to health and safety risks, such as from biological hazards. For example, it may be necessary to supply workers with cleaning products and put a system in place to ensure bathrooms are regularly cleaned to minimise the risk of exposure to biological hazards.

Further information on adequate and accessible worker facilities and accommodation can be found in the Code of Practice: *Managing the work environment and facilities*.

To meet the primary duty, you must *eliminate* health and safety risks at work so far as is reasonably practicable. If you are not able to eliminate risks, you must *minimise* these risks so far as is reasonably practicable.

What is reasonably practicable is informed, along with other factors, by the degree of harm that might result from exposure to a biological hazard and the likelihood of it occurring. In circumstances where both the degree of harm caused and the likelihood of exposure are high, such as an infectious disease outbreak, you may need to do more to manage the risk (e.g. implementing control measures such as limiting customers in indoor spaces and increasing the frequency of routine cleaning). Further information on how to assess risk is provided in **Chapter 5**.

For more information on 'reasonably practicable' see the Interpretive Guideline: *The meaning of 'reasonably practicable'*.

Case study 4 – Farmer

Bill owns a small farm in a rural area. He is listening to the news and hears about reported cases of bird flu at a commercial chicken egg farm near where his farm is located. He has some chickens and begins to feel anxious about a disease outbreak on his farm. He consults authoritative sources – including relevant Government agencies (e.g. agriculture and health) and WHS regulators – for further information about the current situation. He discovers his farm is located outside of the area where restrictions have been put in place. However, the authoritative sources provide advice on measures he can implement to keep his chickens safe.

Bill informs workers of the bird flu cases nearby and what signs of bird flu to look for in the farm's flock. He advises workers to restrict contact with the chickens, and when they must handle the chickens, they should wash their hands before and after using the washing facilities provided and wear a mask. He asks them to report any signs of sickness in themselves or the chickens to him immediately.

Bill encloses his chicken's yard so wild birds are unable to access his chicken's food and water sources and ensures the yard is kept clean. Bill ensures that he disposes of any chicken carcasses in a way that would prevent onwards transmission should there be an infection.

By taking action to get information from reliable sources and implement reasonably practicable control measures, Bill feels less anxious about the risk of bird flu infecting his chickens and his workers getting sick.

2.2 Officers

WHS Act section 27

Duty of officers

Officers must exercise due diligence to ensure the PCBU complies with its duties under WHS laws. Due diligence includes taking reasonable steps to:

- acquire and keep up-to-date knowledge of work health and safety matters
- gain an understanding of the nature of the operations and the hazards and risks associated with those operations
- ensure the PCBU has appropriate resources and processes to manage WHS risks
- ensure the PCBU has appropriate processes for receiving and considering information regarding incidents, hazards and risks and responding in a timely way to that information
- ensure the PCBU has processes in place for complying with the WHS Act and WHS Regulations, and
- verify the provision and use of the resources and processes in place to manage risks, receive and respond to information and comply with the WHS Act and WHS Regulations.

For more information on officers and their duties see the Interpretive Guideline: *Health and*

safety duty of an officer.

Case study 5 – Aquatic facility manager

An aquatic facility is linked to an outbreak of a parasitic infection caused by cryptosporidium, which has affected a swim instructor and several members of the public who recently swam at the facility.

A local government environmental health officer visits the facility to undertake an assessment and direct remedial action. This includes closure of the facility and disinfection of the pool.

The owner of the facility is aware of meeting their requirements under public health laws and has arrangements in place to ensure the water is kept clean to prevent outbreaks.

Louise is the manager of the facility and in her capacity as an Officer, she reviews the last risk assessment conducted by the facility. She finds some control measures previously identified to manage the risks arising from biological hazards are not being implemented correctly, including:

- staff not reminding customers to shower with soap and water before they swim
- staff not ensuring children under 3 years of age wear a swim nappy in the pool, and
- there not being adequate signage displayed throughout the facility explaining the requirements including that customers who have been unwell with diarrhoea or vomiting must not use the pool.

Louise also reviews the frequency and sensitivity of water testing to check it is in line with the requirements in her state or territory.

Louise discusses these issues with the owner, and it is agreed that before the pool reopens, she will:

- provide additional training and instruction to staff on biological hazards and how to manage the risks, including through ensuring requirements to swim in the pool are clearly communicated to customers and followed
- put up additional signage throughout the facility to remind patrons of the requirements to swim in the pool
- implement an audit process to monitor compliance with the controls put in place, and
- review the pool filtration and disinfection procedures and update as needed (e.g. upgrade the pool filters).

2.3 Workers

WHS Act section 28

Duties of workers

While at work, **workers** have a duty to take reasonable care:

- for their own health and safety, and
- to not do anything which could adversely affect the health and safety of other persons at work.

Workers must also:

- comply, so far as they are reasonably able, with any reasonable health and safety instructions given to them by the PCBU, and
- cooperate with reasonable health and safety policies or procedures at the workplace that have been notified to them.

If personal protective equipment (PPE) is provided by the business or undertaking, the worker must, so far as they are reasonably able, use or wear it in accordance with the information, instruction and training provided.

Case study 6 – Nurse

Thomas is a nurse. Before commencing in his new role at a hospital, he ensures that he gets the appropriate vaccinations and completes his induction training, which includes information on preventing and controlling the transmission of biological hazards in a healthcare setting.

Once Thomas commences in the role, he ensures he implements the instructions given to him in training, including cleaning his hands with products and facilities provided at the hospital, properly using the PPE supplied (e.g. masks and gloves) and adhering to infection prevention and control protocols. He realises he is having a reaction to the products supplied by the hospital for cleaning his hands. He discusses with his manager, and an alternative suitable product is found for him to use.

Thomas also ensures that he does not attend work when he is sick.

2.4 Other persons at the workplace

WHS Act section 29

Duties of other persons at the workplace

Other persons at the workplace, such as visitors and customers, must:

- take reasonable care for their own health and safety
- not adversely affect other people's health and safety, and
- comply, so far as they are reasonably able, with reasonable instructions given by the PCBU to allow that person to comply with the WHS laws.

Consideration should be given to how to effectively communicate with other persons at the workplace, so they understand what they need to do to take care of their health and safety. For example, children may need additional support to ensure they correctly follow instructions to implement control measures (e.g. properly cleaning their hands after handling animals at a petting zoo or on a farm). In this example, to minimise risk, young children may be required to clean their hands with hand sanitiser under adult supervision when entering and exiting an enclosed area containing animals.

Case study 7 – Psychologist's client

Mary attends fortnightly face-to-face sessions with a psychologist. This involves Mary and the psychologist talking in close proximity in an enclosed office for up to an hour. The psychologist's office is in a building where effective ventilation and air filtration systems have been installed, to ensure good indoor air quality.

There has been a large increase in the number of cases of seasonal influenza and COVID-19 in the community where Mary lives and the psychology clinic is located. The psychologist has a policy in place that allows clients who are unwell to attend their appointment remotely via video or telephone, or to reschedule their face-to-face appointment with no cancellation fee. As cases of seasonal influenza and COVID-19 increase, the clinic sends a reminder message to their clients about this policy.

On the day of Mary's next appointment, she wakes up with a sore throat and a runny nose. She feels well enough to attend the appointment, so she contacts the psychologist and asks for a remote appointment.

Two weeks later Mary is feeling well. She performs a diagnostic rapid antigen test (RAT) which shows a negative result for COVID-19 and attends her appointment in person. There is a sign at the front door of the psychology clinic requesting that clients wear a mask if they are able to and practice physical distancing in the waiting room. Mary puts on a mask and sits away from the other people in the waiting room.

2.5 Consultation

Consulting with workers and their health and safety representatives

WHS Act section 47
Duty to consult workers

WHS Act section 48
Nature of consultation

WHS Act section 49
When consultation is required

PCBUs must consult, so far as reasonably practicable, with relevant workers and their elected health and safety representatives (HSRs), if any, about health and safety matters. Consultation involves sharing information, giving workers and HSRs a reasonable opportunity to express views and taking those views into account before making decisions on health and safety matters.

Consultation is an ongoing process. PCBUs must consult with workers and HSRs when:

- identifying hazards, assessing risks or making decisions about health and safety, including what control measures are implemented
- making decisions about the adequacy of facilities for the welfare of workers
- proposing changes that may affect the health or safety of workers, and
- making decisions about procedures for:
    - consulting with workers
    - resolving health or safety issues at the workplace
    - monitoring the health of workers
    - monitoring the conditions at the workplace under their management or control, or
    - providing information and training for workers.

Effective consultation with workers improves decision-making about health and safety matters and assists in reducing work-related injuries and illness. Workers can assist in identifying tasks or aspects of their work that may expose them to biological hazards and may have practical suggestions or potential solutions to manage those risks.

You should ensure consultation is accessible for all workers, including workers with a disability or from culturally and linguistically diverse backgrounds who may need, or benefit from, different forms of consultation. For example:

- providing materials and conducting consultation in workers' preferred language(s)
- using culturally appropriate people and messages, and
- using accessible formats (e.g. large print or audio).

Consulting, cooperating and coordinating with other duty holders

WHS Act section 16
More than one person can have a duty

WHS Act section 46
Duty to consult with other duty holders

More than one person can have a duty in relation to the same WHS matter at the same time. This could be because they are involved in the same work activities or share the same workplace, such as shopping centres or construction projects.

The WHS Act requires that where more than one person has a duty for the same matter, each person retains responsibility to meet their duty in relation to the matter and must do so to the extent to which they can influence and control the matter.

Duty holders must consult, cooperate and coordinate activities with all other persons who have a WHS duty in relation to the same matter, so far as is reasonably practicable. Consulting, cooperating and coordinating with other duty holders can help you more easily and effectively control risks, and assist each of you to comply with your duty.

Where you share a duty, each duty holder should:

- exchange information
- find out who is doing what about their respective WHS obligations, and
- work together in a cooperative and coordinated way so risks are eliminated or minimised.

For example, if you run a business (e.g. a hospital) and have labour hire workers (e.g. laundry contractor workers) as part of your workforce, both you and the business providing the workers (e.g. an onsite laundry contractor) will owe those workers a duty of care. As part of this duty of care, both you and the business providing the workers will have to consult them on work health and safety issues. You and the other duty holder should cooperate and coordinate on the arrangements for the consultations with the workers so far as is reasonably practicable. **Figure 5** illustrates how WHS can be shared.

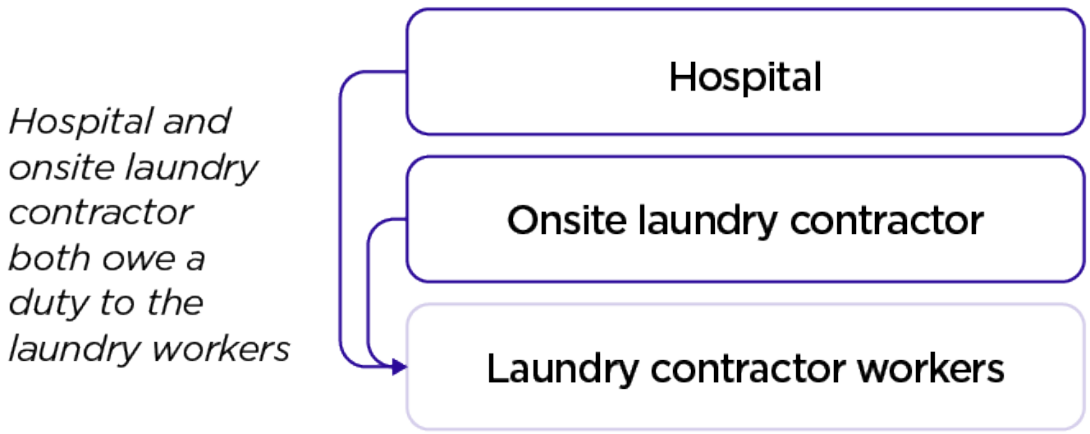

Figure 5: Example of how WHS duties can be shared

Further guidance is available in the Code of Practice: *Work health and safety consultation, cooperation and coordination*.

Case study 8 – A law firm

Sam is renting an office space for their law firm in the same building as several other PCBUs renting office spaces for their businesses.

Sam knows that poorly maintained heating, ventilation and air conditioning (HVAC) systems can be a source of biological hazards in indoor office environments and wants to ensure they are being proactive in providing and maintaining a workplace free of risks to health and safety, so far as they reasonably can.

They read the rental agreement and see the building owner is responsible for regular maintenance of the HVAC system to ensure it is in good working order. Sam liaises with the build manager to check when the HVAC system was last serviced by a qualified technician. The building manager advises it is due to be serviced and arranges for a technician to perform the required maintenance.

The building owner contacts Sam and the other PCBUs affected by the activity and coordinates for the maintenance to be completed with minimal disruption to their work activities. Sam cooperates with the reasonable requests of the building owner to ensure the technician can perform the maintenance work required. Where possible, the technician enters the law firm after usual office hours to conduct the work.

2.6 Other frameworks applying to biological hazards

WHS laws do not operate in isolation, and other laws may also apply to biological hazards.

This includes, but is not limited to, laws for:

- workplace relations
- anti-discrimination
- privacy
- workers' compensation
- biosecurity
- gene technology
- public health
- therapeutic goods including pharmaceuticals
- environmental health
- environmental protection
- food safety
- health, disability and aged care
- educational settings and early childhood care
- personal appearance services
- importation and exportation, and
- building and construction (e.g. ventilation requirements).

There may also be national or international standards and/or certification and accreditation standards which apply to your industry or workplace, such as standards for preventing and controlling infections, laboratories, cleaning, water and food safety, waste management and laundry management.

In some circumstances (such as epidemic scenarios), government authorities may require specific control measures to be implemented through issuing mandatory public health orders or directives, such as placing certain isolation requirements on workers who have tested positive to a specific disease.

You must comply with any of these relevant laws and requirements, in addition to your WHS duties, where they are applicable. For example, complying with public health food safety laws or biosecurity containment requirements does not mean you are managing all the risks to health and safety for workers. You are still required to eliminate or minimise the health and safety risks from biological hazards at work under WHS laws.

3. The risk management process

To manage the risks of biological hazards in your workplace, just as for any other hazard, you can apply the risk management process. This process is depicted in **Figure 6** and described in detail in the Code of Practice: *How to manage work health and safety risks*.

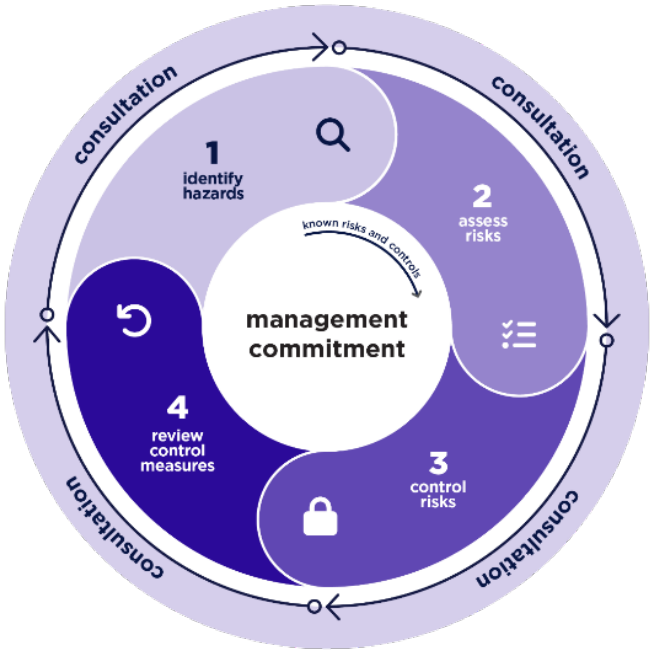

Figure 6: The risk management process

This risk management process involves four steps:

1. **Identify hazards** – find out what could cause harm (see **Chapter 4** for further information)
2. **Assess risks** – understand the nature of the harm the hazard could cause, how serious the harm could be and the likelihood of it happening (see **Chapter 5** for further information)
3. **Control risks** – implement the most effective control measures that are reasonably practicable and ensure they remain effective over time (see **Chapter 6** for further information). This means you must:
    a. eliminate the risks, if reasonably practicable to do so, or
    b. if it is not reasonably practicable to eliminate the risks, implement the most effective control measures to minimise the risks so far as is reasonably practicable in the circumstances
4. **Maintain and review control measures** to ensure they remain effective, are used correctly and working as planned (see **Chapter 7** and **Chapter 8** for further information).

Risk management should be planned, systematic, regularly reviewed and cover all foreseeable hazards and associated risks. The risk management process may be implemented in different ways depending on the size and nature of the business or undertaking.

Larger businesses, and those in sectors where workers are exposed to more biological hazards, are likely to need more complex risk management and consultation processes to meet their WHS duties. For example, a hospital, pathology laboratory or veterinary clinic will need to undertake a more comprehensive risk management process to manage the risks of biological hazards than a sole trader electrician, hairdresser or gardener.

Risk management is a proactive, ongoing process which needs attention over time, including when any changes occur at the workplace or different hazards or risks are identified. For example, if there is an emerging situation with an infectious disease (e.g. outbreaks of Japanese or Murray Valley encephalitis or avian influenza caused by increases in infected mosquito populations), your workplace may need to regularly review your risk assessment and rapidly make and communicate changes to control measures to ensure workers are protected.

At each step of the risk management process, you must consult workers who are, or are likely, to be directly affected by a work health and safety matter. If these workers are represented by an HSR, you must include the HSR in consultation. Seeking feedback from workers about their experience with exposures or potential exposures to biological hazards will help you identify how exposure may occur and identify any gaps in existing control measures and possible solutions.

If control measures are not working effectively, you should review the controls you have already implemented and repeat the risk management process. Signs that control measures are not working effectively include a worker having a potential exposure to a biological hazard in the workplace (e.g. a laboratory worker potentially being exposed to a virus due to wearing incorrect PPE) or a worker becoming ill due to a biological hazard in the workplace (e.g. an office worker getting Legionnaire's disease from the air conditioning system in the building where they work).

You should record your risk management process and the outcomes, including your consultation with workers. This allows you to demonstrate how you have met your WHS duties and will assist you when you need to monitor or review the hazards identified and control measures implemented. Further information on recording your risk management can be found in **Chapter 9**.

3.1 Seek and monitor information from reliable sources

As you work your way through the risk management process you should seek and monitor information and advice from authoritative sources about hazards, risks and control measures relevant to your particular industry, sector or work activity. Examples of authoritative sources can be found in **Appendix J**.

You should be aware of the information sources relevant to your workplace, monitor these for updates and review your risk assessment and control measures as necessary. This is particularly important for biological hazards which can emerge and change rapidly.

Health, agricultural, biosecurity and WHS authorities, as well as industry groups, may issue alerts or advice about a disease or a biological hazard in a specific population, industry or geographical area and the control measures which can be put in place to manage risks. For example, an alert may be issued when there is an increase in Ross River virus cases within a geographical area that has experienced heavy rainfall and an increase in mosquitoes.

Technical specialists who understand the complex nature of biological hazards and the effectiveness of control measures can assist throughout the risk management process. For example, medical experts like Occupational and Environmental Medicine Physicians might be engaged to assist with identifying potential biological hazards in the workplace, how people are exposed and the level of harm they could cause (e.g. communicable disease exposure in a healthcare setting), and an occupational hygienist might be engaged to provide advice on assessing and managing the risk of biological hazards in the workplace (e.g. mould from floods, and organic dust exposure in agricultural or manufacturing settings).

Other sources of information may include industry networks and peak bodies, non-government organisations, unions, safety consultants and similar workplaces.

4. Identifying biological hazards

The first step in the risk management process is to identify all reasonably foreseeable biological hazards arising from the work carried out by your business or undertaking. To do this you must understand where biological hazards can be found in your workplace and how people may be exposed to them. This is covered in **Chapter 1**.

Identifying the potential sources of biological hazards and how an exposure may occur will help you identify risks and determine the control measures you will need to put in place to manage those risks. Hazards should be identified as early as possible, as proactive identification minimises health risks and contributes to a safer workplace culture.

It is important to remember most biological hazards are invisible to the eye, and some actively replicate and adapt. In some cases, testing of potential sources at regular intervals may be required to identify biological hazards (e.g. testing animals, people, cooling tower water or air or surface samples). You may need to seek expert advice, such as from an occupational hygienist, Occupational and Environmental Health Physician or biological risk management specialist, to assist you to identify all the potential sources of biological hazards in your workplace and how people may be exposed to them.

What if a biological hazard is not reasonably foreseeable?

There may be circumstances where the risk of exposure to a biological hazard in your workplace is not reasonably foreseeable. For example, a new and highly contagious virus is introduced to the workplace from the community.

While you may not be able to predict the nature and timing of some biological hazards entering the workplace, you should be prepared to respond swiftly and effectively when unforeseen hazards arise.

Being prepared in a general manner by having in place simple ‘baseline’ control measures (e.g. implementing good hygiene practices and cleaning as routine) will assist with keeping workers safe when unforeseen hazards arise.

Having policies in place which detail responsibilities and outline processes to be followed should an unforeseen biological hazard arise may help you to assess and manage emerging risks in a timely manner. For example, documenting authoritative sources of information for your industry that can be readily consulted for advice about risks and who is responsible for monitoring the sources. Examples of authoritative sources can be found in **Appendix J**.

4.1 How to identify hazards

Consider the industry

Understanding the common sources of biological hazards in your industry, and how people are exposed to them, can assist with identifying specific hazards which may arise from the work carried out by your business or undertaking.

For example, to assist with identifying hazards which may arise from the work carried out by their medical centre, a PCBU may start by considering common sources of biological hazards in the healthcare industry and how workers are exposed to them. This includes viruses, bacteria and parasites which workers are exposed to through person-to-person contact, contact with human biological materials, penetrating injuries, transmission through the air and contact with contaminated materials. This then assists the PCBU to identify specific potential hazards at their medical centre, such as:

- bloodborne viruses (e.g. HIV, hepatitis B and hepatitis C) which workers may be exposed to via contact with human blood through a sharps injury,
- gastrointestinal infections (e.g. cryptosporidiosis and giardiasis) which workers can be exposed to through contact with an infected persons faeces and then touching their mouth, and
- respiratory illnesses (e.g. RSV, pertussis (whooping cough) and seasonal influenza) which workers may be exposed to through direct contact with an infected person, breathing in contaminated air or touching contaminated surfaces and objects then touching their nose or mouth.

Consider and observe the work activities and work environment

To identify potential hazards, you should consider and observe the:

- **work activities** – does the nature of the work activities create a risk of exposure to biological hazards. This includes consideration of whether the work involves:
    - close contact with people or human biological material
    - close contact with animals or animal biological material
    - contact with organic materials
    - contact with sharps or other objects that can cause penetrating injuries
    - the generation of dust or aerosols
- **work environment** – does the work occur in a location which creates a risk of exposure to biological hazards. This includes consideration of whether:
    - the work occurs in higher risk locations
    - there is good air quality in the workplace
    - there are adequate and hygienic facilities in the workplace.

You should consider what hazards may exist in the context of the whole workplace, as some work activities and work environments pose higher risks than others. For example, at a funeral home an embalmer who handles deceased persons will be exposed to different biological hazards than the receptionist working at the front desk. However, you would need to identify the hazards for both work activities and work environments.

Table 2 provides examples of questions about the work activities and environments to consider when identifying potential hazards. Appendix H provides examples of occupations that may have a higher risk of exposure to biological hazards.

Table 2: Questions about the work activities and environments to consider when identifying potential hazards

Work activities and environments	Questions to consider
Does the work involve close contact with other people (including other workers) or human biological material?	Does work involve: • risk of contact with human biological material, such as faeces, vomit, blood, tissues, semen, urine and/or saliva? • being indoors in close proximity or in a crowded space? (e.g. shopping centres, supermarkets and pharmacies)? • regular close/face to face contact with people? • the use of shared equipment or tools? • shared workspaces, such as hot desking? • shared amenities, such as kitchens, bathrooms or eating areas? • providing personal care and support services to other people (e.g. assisting people with showering, toileting or eating)? • working with unwell or vulnerable people (e.g. the elderly or infants)? • contact with deceased persons or human remains? • interacting with people who have recently travelled overseas? (e.g. international passengers at airports)
Does the work involve close contact with animals or animal biological material?	Does work involve: • handling or transporting animals (e.g. livestock)? • providing care or other services to animals? • having contact with domestic animals, or spaces where domestic animals live? • working in areas where pests are present? • being outside in areas where wild animals can be found? • cleaning animal houses, pens, crates, yards or cages? • risk of contact with animal biological materials, such as urine, faeces, manure, blood, tissues, semen and/or saliva? • cleaning areas contaminated with animal or bird waste, such as footpaths, sandpits and eating areas? • working with or having contact with animal carcasses?
Does work occur in higher risk locations?	Does work involve: • being in places where mosquitoes, ticks, fleas, mites or cockroaches are? • being in flood affected areas? • having contact with, or working near dams, ponds, creeks, lakes or other water reservoirs? • traveling to locations where there are outbreaks or endemic diseases? • working in tropical areas (e.g. where tropical diseases are present or there are high levels of humidity)? • working in research facilities, hospitals or pathology laboratories (e.g. working with bacteria)? • working in roof spaces or basements?

Table 2: Questions about the work activities and environments to consider when identifying potential hazards

Work activities and environments	Questions to consider
	• working and living in areas that have no water treatment/filtration for showering and washing? • handling contaminated materials (e.g. mould-contaminated wall linings or sewage-affected building materials)? • working in areas where there is expected to be regular contact with the general public (e.g. airports, cinemas)?
Does the work involve contact with organic material?	Does work involve working, or having contact, with: • rubbish or waste materials, including recycled materials? • clinical waste? • sewage? • landfill leachate? • contaminated dust? • wastewater? • untreated water? • organic dusts? • soil, potting mix or plant material? • marine matter (e.g. sharp shells or barnacles)?
Does the work involve contact with sharps or other objects that can cause penetrating injuries?	Does work involve: • working with needles or scalpels? • handling sharps waste (e.g. used needles)? • working with sharp equipment (e.g. pruners in landscaping)? • working with sharp human or animal parts (e.g. teeth, nails, claws, horns, beaks or bones), such as in healthcare, veterinary, animal processing and animal husbandry? • handling plants with thorns?
Does the work involve the generation of dust or aerosols?	Does work involve: • dry sweeping where there is a higher risk of biological hazards being present, such as in bird cages? • using high pressure cleaning methods where there is a higher risk of biological hazards being present (e.g. using high pressure water to clean an animal pen)? • performing tasks that generate dust or aerosols in poorly ventilated areas? • performing work tasks such as milling or grinding organic material or food processing? • using irrigation and dust suppression from non-potable water? • disturbing settled contaminated materials (e.g. demolishing a mouldy or water damaged building)?
Is there good air quality in the workplace?	In the workplace: • are there damp, confined or enclosed spaces? • can windows, doors and vents be opened when safe to do so? • are the conditions hot and humid?

Table 2: Questions about the work activities and environments to consider when identifying potential hazards

Work activities and environments	Questions to consider
	• is there adequate ventilation, air exchanges and filtration to circulate fresh, clean air? • is there visible or suspected mould? • are the mechanical ventilation systems and/or air cleaning devices appropriately cleaned, maintained and tested to ensure they are in good working order? • are devices or filters needed to remove biological hazards in the air or from a worker's breathing space? • does air sampling need to be undertaken to check for airborne biological hazards (e.g. fungi spores in indoor work environments or bacterial residues in organic dust)?
Are there adequate and hygienic facilities in the workplace?	In the workplace: • is there a regular cleaning schedule for the workspace, work equipment and shared facilities? Are workers and/or cleaners aware of the expected cleaning requirements? • is there a linen changing process for shared sleeping quarters and do laundering facilities have the capacity to reach temperatures required to kill biological hazards? • are there adequate and accessible handwashing facilities with supplies of hand soap and paper towels? • are shared food eating areas provided with handwashing and dishwashing facilities/products? • is waste/rubbish (including feminine hygiene) disposed of appropriately? • is refrigeration for and methods to appropriately heat food items provided? • are water coolers, ice makers, kettles or water heaters cleaned and serviced, and where needed do they have their filters regularly changed? • is drinking water supplied for workers? If so, is it clean and safe to drink? • are workers required to change out of their work clothing prior to leaving work? If so, how is this clothing laundered? • is showering required? If so, what is the water source? • are workers visiting private residences? If so, how do they access adequate and hygienic facilities during work?

Review internal records and data

Internal records and other sources of data can help you to identify exposures or potential exposures to biological hazards. Looking for trends in the data may help you to identify potential hazards. For example, if multiple workers report that their existing asthma has been triggered while at work it could indicate there is a biological hazard present in the air, such as dust or mould.

Sources of data include:

- records of notifiable injuries (including illnesses) and incidents, as well as other incidents which you have recorded per your organisation's policies and procedures
- workers' compensation claims
- feedback from workers and HSRs about exposures or potential exposures
- reports from workplace inspections (e.g. HSR or safety officer walk arounds)
- maintenance inspection reports (e.g. air handling and water systems inspection reports)
- results from qualified testing (e.g. air monitoring and surface sampling reports)
- work systems, policies and procedures (e.g. obvious gaps or absence of these)
- Health and Safety Committee meeting records, and
- risk assessments undertaken.

5. Assessing the risks

Once you have identified all reasonably foreseeable hazards arising from the work carried out by your business or undertaking (see **Chapter 4** for further information), the next step is to assess the risks they create.

A risk assessment is not mandatory for managing the risks of biological hazards at work under the WHS laws. However, in many circumstances it will be the best way to determine the level of risk and the measures that should be implemented to eliminate or minimise risks.

Assessing risks will help you to:

- identify which workers are at risk of exposure to biological hazards
- determine what is causing that risk and when this might occur
- identify if, and what kind of, control measures should be implemented, and
- check the effectiveness of existing control measures.

Remember, assessing risks is an ongoing process. As workplace conditions, job activities, worker numbers and potential hazards evolve, so too should your approach to managing the risks of biological hazards in your workplace.

While not mandatory, you should document your risk assessment and keep it up to date.

5.1 How to assess the risks

During the hazard identification stage, you will have identified the potential biological hazards and sources in your workplace and how people may be exposed. When undertaking the risk assessment you should consider:

- the **likelihood of people being exposed** to biological hazards at work, such as considering:
    - the nature of the biological hazard, including:
        - whether it is communicable (e.g. the viruses which cause measles and gastroenteritis) or non-communicable (e.g. bacterial infections such as tetanus and Legionnaire's disease)?
        - whether it can spread to people through multiple sources (e.g. norovirus which can spread through direct contact with an infected person or their vomit or faeces, through vomitus in the air, and through contaminated surfaces, food and water)?
        - how easily can it infect people? (e.g. can people be infected by standing near another person for a short period of time, or to become infected does a person need to have an open wound)?
    - the nature of the source/s, including:
        - how often the source/s is present in the workplace – is it constant (e.g. a water source near farmland), routine (e.g. when cleaning out animal enclosures), seasonal (e.g. when harvesting or processing crops, or when pollen is in the air) or occasional (e.g. increased mosquito populations when there is heavy rainfall and warm temperatures)?

    - the nature of the exposure, including:
        - who has contact with the source/s, how long do they have contact for and how often – for example, does a worker have a short interaction with the source occasionally (e.g. a postal worker delivering a package to a sick person's home) or does a worker have a long interaction with the source frequently (e.g. a nurse providing in home health care for a sick person for several hours multiple times a week)?
        - if the work activities or work environment increase the likelihood of exposure to the biological hazard? (e.g. work which involves close contact with other people, working with animals, working outdoors where insects may be present or working in indoor spaces with poor air quality)?
- the possible **consequences of people being exposed** to biological hazards at work, including considering:
    - if there are people at higher risk of severe harm in the workplace who may be exposed
    - if exposure could cause severe injury or illness (e.g. exposure to certain plants and marine matter), or be fatal (e.g. exposure to toxins from venomous animals)?
    - if the harm is immediate (e.g. allergic reaction) or gradual (e.g. occupational cancers)
    - if the harm is short-term (e.g. acute skin rash) or long-term (e.g. chronic respiratory problems)
    - if the harm is reversible (e.g. tinea) or irreversible (e.g. neurological damage)
    - if there are psychological consequences of exposure (e.g. trauma following scratching or biting events, or stress while waiting for test results checking for infection)
- the **effectiveness of existing control measures** in eliminating or minimising the risks of each biological hazard, including considering:
    - what you already have in place to control the risks
    - what the current industry standards are, including if there are any relevant Australian Standards
    - the availability, use and effectiveness of control measures (e.g. medical preventatives such as vaccines)
    - the availability, use and effectiveness of medical treatments (e.g. treatments that prevent or minimise symptoms/illness).

The level of risk will increase as the likelihood and/or consequences of an exposure increase. For example, exposure to grain dust may be low when crops are not being harvested, and when exposure to grain dust is low workers may only experience temporary, minor health issues such as coughing and phlegm. However, during harvest season exposure to grain dust may be high, and the health issues workers experience could increase in severity if the high exposure is not appropriately managed. Prolonged high exposure to grain dust could lead to serious lung diseases over time such as hypersensitivity pneumonitis, work induced or aggravated asthma, chronic bronchitis, byssinosis and cancer.

The more severe the risks are, the more you will need to do to manage the risks. For example, people who work with horses (e.g. trainers, jockeys and stablehands) may be at risk of contracting both tinea (a common, contagious fungal infection of the skin) and Hendra virus (a rare disease that can be passed from an infected horse to people). While tinea is more widespread than Hendra virus, tinea is likely to cause only minor, temporary harm in most people, whereas infection with Hendra virus can cause severe respiratory or neurological disease and is often fatal. This means you will be expected to do more to manage the risks of Hendra virus, given the degree of harm that could occur, than the risks of tinea in the workplace.

You may have multiple hazards to consider during the risk management process. Considering and assessing these hazards together will help you to:

- understand any potential combined impacts (e.g. that a particular worker is at high risk of exposure to several different biological hazards), and
- identify potential linkages in how the risks of different hazards can be managed (e.g. a need to improve the air quality in the workplace using ventilation and air cleaning to reduce the risk of workers being exposed to several different biological hazards which can be spread through the air).

In some cases, workers undertaking work activities outside of the formal workplace (e.g. fields trips and site surveys) are at increased risk from biological hazards due to the nature of the work being undertaken and/or the work environment. These work activities must be appropriately assessed as part of the risk management process.

Information from authoritative sources (e.g. health or WHS authorities and other experts) may assist you to consider the potential impacts of biological hazards in your workplace.

5.2 Workers and other people at higher risk of severe harm

Some people in the workplace may be at higher risk of severe harm after exposure to biological hazards (**Vulnerable people**), such as:

- pregnant and breastfeeding women
- infants
- the elderly
- people with disability, and
- people who are medically predisposed to infections or allergies, including immunocompromised workers.

For example, a person with asthma is more vulnerable to harm from exposure to organic dust (e.g. flour, wood or grains), and a person undergoing cancer treatment may be immunocompromised and have a harder time fighting off common infections and diseases. Vulnerable people can be found in all industries and workplaces, not just high-risk settings (e.g. hospitals and aged care facilities).

Additional consideration may also be needed if you have workers who are:

- young or from culturally and linguistically diverse backgrounds who may require tailored communication to ensure they understand risks and controls, or
- more likely to be severely impacted in other ways by exposure to biological hazards (e.g. workers who do not have access to paid sick leave).

As a PCBU, you must do all that you are reasonably able to manage the risks of biological hazards to workers and other persons at the workplace, including vulnerable people where the person has disclosed those needs or you are aware. For example, if a veterinary nurse advises their manager that they are pregnant, extra precautions need to be considered to reduce the risk of that worker becoming infected with toxoplasmosis (e.g. adjusting their work duties or additional PPE). This is due to the risk that the veterinary nurse could pass the parasite which causes the toxoplasmosis infection to their unborn baby which may cause serious health problems.

In the case of a biological hazard outbreak in the workplace that has the potential to spread easily between people (e.g. measles in a school setting) or where a worker's circumstances change and increase the risk of severe harm from a biological hazard exposure (e.g. a worker becomes immunocompromised) you may need to explore temporary work adjustments for workers to manage risks. This may include working from home or moving them to a different role to prevent their exposure.

You must ensure you are complying with industrial relations obligations (e.g. the Fair Work Act) and equal opportunity and disability discrimination legislation when determining reasonable adjustments to support workers.

As well as making changes for individual workers you must still eliminate or minimise the risks for all workers so far as is reasonably practicable. You must also keep any information about a worker's medical history you have been provided confidential and ensure you comply with privacy and anti-discrimination requirements.

5.3 Exposure Limits

Some biological hazards, such as organic dusts, are airborne contaminants which can be harmful to health when breathed in. Under WHS laws, in addition to ensuring the risks from airborne contaminants are eliminated or minimised so far as reasonably practicable, you must also ensure that no person in the workplace is exposed to an airborne contaminant at a concentration exceeding the workplace exposure standard (WES). Air monitoring might be needed to ensure workers are not exposed to airborne concentrations above the relevant WES for dust from cotton, grain (oats, wheat and barley) and wood.

You must be aware of any WES that applies to biological hazards in your workplace and should consider these when assessing risks and implementing control measures.

From 1 December 2026, the current WES will be replaced by the new Workplace exposure limits for airborne contaminants. You must continue to comply with the WES until this time. Further information can be found in Safe Work Australia's website: Workplace Exposure Limits – airborne contaminants.

6. Controlling the risks

As part of assessing the risks you will have considered the effectiveness of existing control measures (see **Chapter 5** for further information). The next step is to determine what further action is required to control any remaining risks.

You must always aim to *eliminate* the risks at work. Given the nature of biological hazards, elimination may not be possible for many workplaces. Where elimination is not reasonably practicable, you must *minimise* the risks as much as is reasonably practicable using control measures.

In most cases you will need to use a combination of control measures to effectively manage the risks of biological hazards in your workplace. However, it is possible some control measures can be effective in reducing the risks of multiple biological hazards when workers are exposed to them in the same way. For example, if you identify multiple potential biological hazards in your workplace which are transmitted through the air, in addition to ventilation it may be appropriate to require workers to wear a respirator as part of managing the risks of these hazards.

Ensuring you have implemented baseline control measures (e.g. ensuring good air quality, implementing routine cleaning and providing workers with suitable PPE) can protect workers from some biological hazards (e.g. communicable diseases). These baseline control measures can be supplemented with additional, specific control measures (e.g. implementing an air monitoring program) required to minimise risks for other biological hazards (e.g. non-communicable diseases).

Seeking advice from reliable sources (e.g. health, agricultural, biosecurity or WHS authorities and other experts) may assist you to identify evidence-based control measures appropriate for managing the risks in your workplace. Further information on key resources can be found at **Appendix J**.

What if knowledge about a biological hazard is limited?

If knowledge about a biological hazard is limited (e.g. there is a new or changing biological hazard) you should take a precautionary approach to managing the risks until there is greater certainty. For example, if there is a new strain of avian influenza in your geographical location, you should take preventative action to limit contact with birds and their biological materials until there is certainty about the potential harm the new strain could cause.

To manage the risks when there is uncertainty you should:

- follow the latest guidance from relevant authorities, such as health, agricultural, biosecurity or WHS authorities
- review available information from other reliable sources, such as industry groups and peak bodies
- consider other biological hazards with similar sources and ways that people are exposed, and assess if the control measures used to manage their risks would likely assist in your circumstances, and
- consult with your workers throughout the process.

6.1 How to control risks

Where elimination is not reasonably practicable, the hierarchy of control measures should be applied to identify the most effective and reliable control measures to *minimise* the risk as much as is reasonably practicable. The hierarchy ranks control measures from the highest level of protection and reliability to the lowest, as shown in **Figure 7**. The least effective control measures are administrative controls and personal protective equipment (PPE) which rely on human behaviour to be effective (e.g. procedures may not be understood and followed, and PPE may not always be correctly used and worn).

Further guidance on the risk management process and the hierarchy of control measures in the Code of Practice: *How to manage work health and safety risks*.

Figure 7: The Hierarchy of Control Measures

Eliminating the risk

The most effective way to control risks is to eliminate the risk of exposure to the biological hazard in your workplace.

To eliminate the risk of exposure you could remove sources of biological hazards from the workplace or take steps to prevent a biological hazard, such as:

- ensuring there are no pest animals/insects in the workplace through regular pest extermination/prevention
- preventing outbreaks of harmful levels of biological hazards, such as the growth of mould and yeast, by ensuring routine building maintenance to prevent leaks which cause moisture build up and ensuring ventilation and air handling systems are operating effectively
- ensuring goods that do not meet quality standards do not enter the yard/premises by inspecting goods and rejecting any which are contaminated, such as with visible mould or that are wet/damp
- prescribing oral rather than intravenous medications for patients where appropriate, to avoid workers handling needles

- ensuring, where possible, that people who are unwell, or are experiencing common symptoms of communicable diseases, do not attend the workplace, such as:
    - facilitating unwell workers and those who have been exposed to an infectious biological hazard to work from home (where it is possible for them to perform the requirements of their role from home and they are well enough to do so) or take leave under their workplace entitlements
    - sending children home from childcare or school if they attend when they're unwell
    - requesting that customers/clients reschedule appointments or hold appointments virtually, and
    - allowing customers/clients to place orders online or via telephone.

Minimising the risk

Substitution, isolation and engineering controls

If eliminating the risk of exposure to the biological hazard is not reasonably practicable, you must minimise the risk of exposure by implementing control measures. **Table 3** provides examples of how to minimise the risk of exposure to biological hazards by implementing substitution, isolation or engineering controls.

Table 3: Examples of substitution, isolation or engineering controls

Control type	Examples of controls
Substitution controls involve minimising the risk of exposure to the biological hazard by replacing a hazard or hazardous work practice with one which presents a lower risk.	**Replace a higher-risk work activity with one that is lower risk**, such as using alternative cleaning methods (e.g. using vacuums with High-Efficiency Particulate Air (HEPA) filters or wet mopping rather than dry sweeping to keep organic dust from becoming airborne) which minimises the generation of dust and aerosols which may contain biological hazards.
	Replace a higher-risk material or product with one that is lower risk, such as: • in a research laboratory, using a less dangerous form of a biological hazard for study, such as an inactivated form of the microbe or samples sourced from low-risk areas/countries, or • substituting the source of the biological hazard for one that is lower risk (e.g. changing the type of timber used to fuel a machine or industrial process for one which generates less dust).
	Replace reusable equipment with disposable equipment, such as using disposable equipment (e.g. including hair caps, eye protection and masks) instead of reusable equipment when there's a risk the equipment will be contaminated with a biological hazard and it would be difficult to clean the equipment before the next use.
Isolation controls involve minimising the risk of exposure to the biological hazard by physically separating the source of harm from people by distance or using barriers.	**Move high-risk work activities away from other work areas**, such as: • conducting high-risk work activities in specific, fit-for-purpose and isolated areas, rooms or facilities (e.g. a containment facility or laboratory) • separating high-risk areas (e.g. where animals are kept or grain is processed) from other work areas and thoroughfares, such as general office areas and break areas (e.g. lunchrooms), or • having a dedicated space for cleaning, disinfecting and sterilising used equipment away from other workers. **Separate people from the biological hazard source**, such as: • restricting access to areas where exposure to a biological hazard is likely by using barriers and ensuring appropriate supervision of visitors to work sites to prevent them from entering these areas • scheduling high-risk work activities during times when there are less people in the workplace, such as disposing of potentially contaminated waste materials outside of standard work hours • temporarily preventing access to an area where an exposure is likely, such as using barriers in a childcare setting to limit access to an area where a child has vomited until the vomit has been cleaned up • immediately isolating any unwell/infected animals from other animals and humans • isolating waste at the point of generation into the appropriate waste storage, such as putting used needles immediately in a puncture-resistant container for disposal or double bagging contaminated material in an appropriate leak proof bag and sealing it as soon as practical, or • quarantining areas for contaminated products, animals, silage and clothing.

Table 3: Examples of substitution, isolation or engineering controls

Control type	Examples of controls
Engineering controls involves minimising the risk of exposure to biological hazards by putting in place physical control measures, including using mechanical equipment or processes.	**Use different equipment to lower the risk**, such as: • using specialised equipment to disinfect equipment, air and spaces, such as using UV light (with appropriate safety controls) • enclosing the biological hazard to minimise the potential exposure of a worker undertaking a task, such as using a biosafety cabinet in a research laboratory • replacing old tractors and other mechanical plant with ones that have enclosed cabins with HEPA filters, or • using a safety engineered sharps device such as retractable needles.
	Use different systems to lower the risk, such as: • using an automated system to handle a potentially contaminated material instead of by hand, such as automatic sampling systems, or • installing water handling systems to ensure water is processed correctly before being reused in the workplace, such as a water filtration system.
	Ensure adequate facilities and environment are available to lower the risk, such as: • ensuring there are adequate facilities for people to maintain good hygiene practices, such as hand washing and sanitisation facilities • installing non-touch taps (e.g. sensor taps or wrist, elbow or foot operated taps) and foot operated waste bins to minimise the risk of contaminating hands • installing protective screens to create a physical barrier between workers and customers, or • ensuring there are adequate facilities to safely prepare and store food (e.g. fridges and microwaves).
	Use air management systems to control airborne biological hazards, such as: • using an HVAC system and air filters (e.g. HEPA filters) to filter the air and improve the air quality (increase clean air or dilute biological hazards transmitted through the air) in an indoor workspace • using Local Exhaust Ventilation (LEV), extraction systems or an air purifier to filter the air and remove the hazard from the worker's breathing space • installation of mechanical ventilation for confined animal facilities to draw contaminated air away from workers and other people, or • using an air lock/negative pressure room to minimise the potential of biological hazards being transmitted through the air to common areas.

Administrative controls

If a risk remains after implementing substitution, isolation and engineering controls, it should be minimised by implementing administrative controls, so far as is reasonably practicable.

Administrative controls include policies or procedures that are designed to minimise exposure to biological hazards, as well as the provision of adequate information, training, instruction and supervision needed to ensure workers can work safely.

Some administrative measures will be necessary to ensure substitution, isolation and engineering controls are implemented effectively (e.g. following safe work procedures when using equipment).

Examples of administrative control measures include:

- **implementing policies or procedures** (in combination with higher order control measures) to further minimise the risk, such as:
    - encouraging/providing vaccination for vaccine preventable diseases that may be present in your workplace. Recommended vaccinations for those at increased risk of vaccine preventable diseases because of their work can be found in the current addition of the Australian Immunisation Handbook. Further information on vaccination can be found in **Appendix F**
    - encouraging everyone in the workplace to practice good hygiene, including physical distancing and hand hygiene
    - implementing cleaning, disinfection and sterilisation processes, both routinely and following a known or potential exposure in the workplace
    - implementing inspection and maintenance programs, such as spot checks on equipment and workspaces to identify potential sources of biological hazards, and regular monitoring, testing and treatment/cleaning of air handling, water systems and cooling towers in buildings to prevent them becoming a biological hazard source (e.g. growing *Legionella* bacteria)
    - surveillance testing workers and other persons in the workplace who have contact with vulnerable people (e.g. an aged care facility) during periods of high community transmission, such as using an antigen test kit for RSV, influenza and COVID-19
    - implementing a system which ensures waste is stored, handled, treated and disposed of correctly, such as correctly labelling and securely sealing waste containers, autoclaving and incinerating microbiological waste and putting pathological waste in secure containers for transportation
    - developing policies which outline what should happen when there are infectious disease outbreaks or during pandemics
- changing how workers do a work task to lower risk, such as:
    - increasing the frequency of cleaning for a piece of equipment to prevent the build-up of a biological hazard
    - sharing job responsibilities to limit exposure time to a hazardous task, such as creating a cleaning roster for shared facilities in worker accommodation so tasks which could expose workers to biological hazards are rotated between workers

- providing information, training and instruction, such as:
    - education programs to raise awareness of potential biological hazards in the workplace, including the sources of biological hazards, how people are exposed, the potential harms and how to prevent exposure
    - educating workers on their leave entitlements, including sick leave
    - instruction for workers on what control measures are in place and how to work safely
    - training workers on workplace policies and procedures, including who to notify and what to do if they are exposed, or potentially exposed, to a biological hazard
    - displaying signage in the workplace to inform people of biological hazards which they may be exposed and control measures, such as hand washing guidance in bathrooms.

If you put in place administrative controls, you should ensure they are being complied with.

Personal Protective Equipment (PPE)

If a risk remains after implementing the above types of control measures, the remaining risk should be minimised, so far as is reasonably practicable, with suitable **PPE**.

If you are using PPE as a control measure to minimise risk, it must be provided at no cost to workers and be suitable for:

- the worker (e.g. correct size and fit)
- the work
- work environment, and
- meet any relevant Australian standard.

PPE will help reduce exposure to a biological hazard but only if workers wear suitable PPE and use it correctly. To assist with this, you should ensure:

- you have developed and implemented policies and procedures on the correct use, maintenance, cleaning or disposing, and storage of PPE
- workers have been trained in the correct use of PPE, including when to use PPE and how to safely remove and clean or dispose of contaminated PPE
- the PPE selected is correct for the biological hazard as well as the type and potential level of exposure (e.g. if respirators are used to manage the risk of being exposed to organic dust, they must have a suitable respiratory protection factor for the work undertaken)
- where tight fitting respirators are used, workers are fit tested prior to first use to ensure appropriate fit and comfort
- the PPE is regularly checked to ensure it is in good condition, is not faulty and is being cleaned and stored correctly, and
- it is being used correctly by workers.

Where multiple different types of PPE are being used to minimise risks for workers it is important to ensure they do not compromise the fit and protection of one another. For example, ensuring that safety goggles do not prevent an effective seal on a face mask.

Workers must follow procedures to ensure they are wearing PPE correctly.

Examples of PPE suitable for different biological hazards include:

- wearing face shields and/or eye protection to prevent exposure to splashes and sprays of biological hazards
- using long sleeve clothing to limit contact with plants
- using repellent to minimise the risk of mosquito bites
- using appropriately fitted and suitable respiratory protective equipment to prevent the inhalation of small particles that may contain a biological hazard transmitted through the air.

You may need to implement a combination of control measures from different levels of the hierarchy to effectively manage the risks of a biological hazard.

Detailed information on the control measures you can implement to manage the risks of biological hazards can be found in the appendices of this Code.

6.2 Selecting control measures

You must consult with your workers, and any HSRs, when deciding what control measures to implement.

When you are selecting the most appropriate combination of controls to manage risks of biological hazards, consider:

- what will be most effective and reliable and offer the highest level of protection (i.e. controls located towards the top of the hierarchy of controls, such as substitution, isolation and engineering controls)
- what control measures are most suitable for your workplace and your workers
- what is reasonably practicable to implement in the circumstances, and
- if these controls give rise to additional hazards.

The greater the risk, the more that is required to be done to eliminate or minimise it. This may mean using a combination of control measures.

The below case studies illustrate how a combination of control measures from across the hierarchy can be implemented to minimise the risks of biological hazards.

Case study 9 – Nail salon worker

May is a nail salon worker. She holds a customer's hand at the start of an appointment and notices the skin on the customer's hand has patches of red blisters. She suspects the customer has a skin infection based on the training and information she has been provided by her employer on potential biological hazards in the workplace.

The workplace has a policy that customers can reschedule their appointment when they have, or suspect they have, an infectious disease which may put others at risk, including skin conditions. Where an appointment is not rescheduled, the workplace has a policy allowing workers to perform manicure services when they suspect a customer may have a skin infection. However, they must take precautions, including wearing gloves when touching the customer, thoroughly cleaning their hands after taking off their gloves, disinfecting their workspace when they finish the appointment with the customer, safely disposing single use equipment and sterilising any reusable equipment.

May puts on the disposable gloves supplied by their employer during the appointment and at the end of the appointment cleans her workspace and equipment using the cleaning supplies and following the instructions provided by her employer.

Case study 10 – Vet

Jane is a vet in a rural area. She receives a call from a farmer who has a horse that is sick with a suspected zoonotic disease. Before attending the farm, she checks to see if the horse is up to date on their vaccinations (e.g. Hendra vaccine) and ensures she has all the equipment she will need to do an examination.

Jane is up to date with all vaccinations for diseases which she could be exposed to from a sick horse (e.g. Q fever vaccine) as part of general precautions for her occupation. She also recently checked information from reliable sources (e.g. health, WHS, agricultural and biosecurity authorities) and confirmed that there are no known outbreaks of zoonotic diseases in her geographical area.

Once she arrives at the farm, she ensures she has a suitable space to put on and take off her PPE. Before coming into direct contact with the horse, she puts on suitable PPE (including a mask, gloves and face shield), to avoid exposure to any potential biological hazards from the horse and their biological materials (e.g. the horse's respiratory secretions, saliva or blood).

Following the examination Jane safely removes her PPE and cleans her hands with hand sanitiser. Jane ensures all her disposable PPE is placed in a suitable rubbish bag for correct disposal, and her reusable PPE (e.g. splash-proof overalls and rubber boots) and equipment is stored appropriately for the drive back to the clinic. Once back at the clinic, she cleans and disinfects the reusable PPE and equipment and restocks her disposable PPE for her next off-site examination.

Case study 11 – Greenskeeper

Oliver is a greenskeeper at a golf course. He needs to mow long, dry grass surrounding the golf course, as well as undertaking regular maintenance of the turfgrass. He is aware from the training and information provided by his employer on potential biological hazards in the workplace that the grass may contain animal biological material (e.g. kangaroo droppings) and that mowing the grass, especially in summer when conditions are dry, could create a dust containing biological hazards which if inhaled, could cause a bacterial infection (e.g. Q fever).

Oliver uses a mower with an enclosed airconditioned cabin when moving the long grass, which helps protect him from inhaling dust. When using the push mower and undertaking regular maintenance of the turfgrass, Oliver wears suitable PPE, such as eye protection and a respirator to prevent exposure to dust and small airborne particles.

Case study 12 – Fruit picker

Samson is a fruit picker and lives in accommodation provided by his employer on an apple orchard. During the day, he picks apples close to irrigation systems and stagnant water. He is aware from the training and information he has been provided by his employer on potential biological hazards in the workplace that, in addition to the mosquito control program in place, he needs to take precautions to minimise the risk of being bitten by a mosquito as they can spread viral infections (e.g. dengue fever, Ross River virus, Murray Valley Encephalitis or Japanese Encephalitis).

To reduce the risk of being bitten by mosquitoes when working outside, the PCBU considered whether they could eliminate mosquito populations by continuously removing all stagnant water and using chemical sprays, however, determined this was not reasonably practicable for their workplace and other controls would be needed. To address the risks, Samson minimises exposed skin by wearing PPE provided by his employer, including a long sleeve shirt, trousers, enclosed shoes and a hat with a head net to protect the face. He also applies the insect repellent supplied by his employer on any exposed skin.

Samson realises that he is having a reaction to the repellent supplied by his employer. He discusses with his manager, and an alternative suitable product is found for him to use. The accommodation he is staying in has appropriate insect screening and a mozzie-zapper, and Samson is aware from the information provided by his employer during his induction that he should limit his time outside during high-risk mosquito biting times (e.g. dawn and dusk) in order to minimise the risk of being bitten.

Case study 13 – Demolition contractor

Angelina is a demolition contractor who has been hired to remove an old, abandoned storage shed from a site prior to a builder constructing a new shed. When conducting the risk assessment, she considers potential sources of biological hazards and identifies that the shed contains mould growth, and pests and their waste products.

To eliminate the pest risk, Angelina has an exterminator clear the shed. She notes there is a risk the mould and pest waste products could become airborne during the demolition work. She selects respiratory protective equipment (RPE) with an appropriate filter to protect workers from airborne hazards throughout the demolition. Workers have recently undergone routine fit testing and received training on how to correctly use, store and clean RPE. In addition to RPE, workers are provided safety googles and gloves to prevent any biological hazards spreading through direct contact.

Prior to commencing the work, Angelina directs any workers not involved in the demolition phase (such as the builder) to conduct their work in another area on the site away from the shed, to minimise their risk of airborne exposure to biological hazards.

Following the completion of the demolition work, workers are instructed to ensure prior to leaving the site they remove and clean or dispose of their PPE, change out of their dirty work clothes and put them in a sealed container, and wash their hands. This will help to ensure that they minimise the risk of contaminated materials being spread to cars and

homes, putting others at risk of exposure

Case study 14 – Aged care worker

Rosa is a personal care worker in a residential aged care facility. During her evening shift, she assists a resident who has sustained a bleeding skin tear by bumping their leg on some furniture. Rosa is aware from her training and the facility's infection prevention and control policies that blood can carry biological hazards such as bloodborne viruses (e.g. hepatitis B, hepatitis C and HIV).

Before providing care, Rosa takes a moment to reassure the resident, explaining the steps she will take to ensure both safety and comfort. She then dons appropriate PPE supplied by her employer, including gloves, a disposable gown and a face shield to protect against splashes. She follows the facility's safe work procedures for managing exposure to blood, including using sterile dressings and avoiding direct contact with the wound site.

After completing the wound care, Rosa safely removes and disposes of her PPE, washes her hands with soap and water and disinfects any equipment used. She ensures the resident is comfortable and maintains their dignity by helping them change into clean clothing and restoring their privacy. Rosa documents the incident and reports it to the registered nurse, who arranges for the resident to be medically reviewed.

The facility's policy also includes post-exposure protocols for workers, including access to medical advice and bloodborne virus testing if a potential exposure occurs. Rosa confirms that no breach occurred and continues her shift with confidence in the safety measures in place, knowing she was able to uphold both infection prevention and control standards and compassionate care.

Case study 15 – Customer service officer

Lena works at a government service centre, assisting customers with identity verification and processing applications. She is aware from the training and information provided by her employer on potential biological hazards in the workplace that she may be exposed to respiratory illnesses during face-to-face interactions, particularly during peak influenza season.

The service centre has implemented several control measures to minimise this risk. This includes displaying signage for customers on what to do if they are displaying symptoms, providing disposable masks and hand sanitiser at the entry and at every service point, positioning desks to maximise distance between workers and customers and installing protective screens. Workers are instructed to use hand sanitiser before and after each customer interaction, wipe down counters and shared equipment regularly, and avoid sharing pens or other items.

When a customer arrives at Lena's service point displaying symptoms of illness, Lena puts on a mask and politely offers the customer a mask to wear while they are in the building. After realising the customer requires assistance with a matter which can be easily handled at the self-service kiosk, she encourages them to use it to reduce prolonged contact.

7. Implementing control measures

Control measures should be implemented in a deliberate sequence that maximises their effectiveness while minimising unintended risks. For example, while ventilation is a valuable control measure, the air movement it generates can inadvertently aerosolise biological hazards potentially increasing the risk of exposure rather than minimising it. Physical devices (e.g. fans) can also introduce other hazards, such as trip hazards. PCBUs should ensure they assess and manage any additional risks when planning and implementing controls.

7.1 Test control measures

After selecting control measures to manage risks, if time permits, testing them through a trial period can assist you to assess their effectiveness and make adjustments as required. For example, during the trial period you can ensure the control measures are suitable for your workplace, operate as intended and do not introduce new risks (e.g. heat stress from PPE).

You should allow time for your workers to adjust to changes before assessing the effectiveness of control measures. During this stage, you should frequently check with your workers on how they think the control measures are working and supervise workers to ensure they are being implemented effectively. This will enable you to identify if any modifications need to be made.

7.2 Workplace policies and procedures

Workplace policies and procedures can provide important information and help ensure workers understand the measures in place for managing the risks of biological hazards. Policies often detail responsibilities and help set clear expectations. Procedures often describe work tasks, identify hazards and document how the task is to be performed to minimise the risks.

Any policies and procedures relating to managing the risks of biological hazards must be developed in consultation with your workers and any HSRs. All workers must be made aware of the policies and procedures and what is expected of them.

7.3 Information, training, instruction and supervision

You must provide any information, training, instruction or supervision that is necessary to protect workers from exposure, or potential exposure, to reasonably foreseeable biological hazards at work. You must ensure that the information, training, instruction or supervision provided to workers is suitable and adequate for your workers.

You should ensure workers understand:

- the potential biological hazards in the workplace, including the sources of biological hazards, how workers are exposed to them and the potential harms
- the measures in place to control risks
- how to properly use (e.g. put on and take off), wear (e.g. the correct fit), store, maintain and safely dispose of PPE
- vaccination recommendations (if any)
- the work policies and procedures that must be followed

- procedures and reporting requirements in the event of an exposure, or potential exposure, to a biological hazard, including when to seek medical advice (see **Chapter 10**).

Information, training and instruction should be provided by a person with appropriate knowledge and expertise, for example, in human health, infection prevention and control and/or WHS, where reasonably practicable. Information should be presented in a way that can be easily understood by your workers and should take into account literacy needs and the cultural or linguistically diverse backgrounds of your workers. For example, seasonal farm workers that are young or from culturally and linguistically diverse backgrounds may require tailored induction or training approaches to ensure they understand the information provided.

You should consider what communication methods will work best to reach workers and consult with workers on their preferences. This can include formal and informal communication methods such as intranet articles, stand up meetings, website pages, emails, signs and posters.

Communication is an ongoing, two-way process. You should ensure workers are provided with regular reminders of the control measures in place to manage the risks of exposure to biological hazards, and that they have a duty under WHS laws to comply with any reasonable instructions, policies and procedures given to them at the workplace. You should encourage workers to provide feedback on the control measures, including any issues with compliance or opportunities for improvement.

Other persons in the workplace also have a duty to comply with any reasonable instruction that is given by you, so far as the person is reasonably able. You should ensure you provide necessary information to other persons entering the workplace (e.g. customers, visitors and clients) on any hazards and the control measures and policies that they are required to comply with to keep themselves and others safe.

7.4 Maintenance of control measures

Control measures need regular monitoring and maintenance to ensure they remain effective. This includes ensuring they remain fit for purpose, suitable for the nature and duration of the work, and are set up and used correctly. This step links back to the start of the risk management cycle and allows for continuous improvement.

You should ascertain what maintenance a control measure will require when you implement it and establish a schedule for routine checks and maintenance. To ascertain what maintenance is required and to ensure effectiveness you should consider the nature of the control, the nature of the risk it seeks to control and the manufacturer’s instructions for any equipment. In some cases, you may need the assistance of a person with appropriate training and expertise to maintain control measures. For example, if using a HVAC system to improve ventilation in an indoor space, a technician may need to be engaged to carry out maintenance, water treatment, inspection and cleaning of the system to ensure it is in good working condition and does not introduce new risks into the workplace (e.g. mould spores or legionella bacteria).

8. Reviewing control measures

The control measures you put in place should be reviewed regularly to make sure they work as planned and are not creating any new risks to health or safety. When deciding how frequently to carry out a review, you should consider the level of risk. Where there has been an exposure to a biological hazard or you determine that there is a high likelihood of exposure, and/or severe consequences should an exposure occur, you may need to review the effectiveness of control measures more frequently. However, it is important to have a regular schedule for reviewing control measures, as over time even if the risk of exposure is low and there have been no known exposures, there still may be biological hazards present and opportunities to improve how you control risks. For example, you could regularly monitor the quality of indoor air to detect if airborne biological hazards are present in the workplace, and if they are detected you could review the control measures you have in place to manage the risks of airborne biological hazards to see if they can be improved to eliminate or minimise the risks.

As part of the risk management process, the WHS Regulations require the review of control measures including in the following circumstances:

- when the control measure does not control the risk so far as is reasonably practicable. For example, despite the use of retractable syringes a needlestick injury occurs, or an illness related to a biological hazard exposure is reported
- before a change at the workplace which is likely to give rise to a new or different risk arising from a biological hazard, that the current control measures may not effectively control. For example, a mower is purchased to mow grass which was previously grazed by sheep. There is a risk that the mower will generate contaminated dust which workers might breathe in when they mow the grass
- if a new relevant risk or hazard is identified. For example, sampling of water contained in a HVAC system cooling tower identifies Legionella bacteria
- if the results of consultation indicate a review is necessary. For example, workers identify a control measure is not working effectively, or a control measure creates a new hazard/risk, and
- if a HSR requests a review because they reasonably believe one of the above may affect the health and safety of a worker/s, and the PCBU has not already adequately reviewed the control measure.

Common review methods include inspecting the workplace, observing work tasks, consultation, and analysing records and data. You can use the same methods as in the initial hazard identification step to check control measures. You must also consult with your workers and any HSRs. If problems are found, go back through the risk management steps (outlined in **Chapters 4, 5, 6** and 7), review your information and make further decisions about control measures.

Where possible, it is always useful to gather evidence and data on workplace compliance with any control measures you implement. Understanding how control measures are used in the workplace can assist you when reviewing their effectiveness.

9. Recording your risk management

Keeping records of your risk management process and outcomes allows you to demonstrate how you have met your work health and safety duties. It also assists you when you need to monitor or review the hazards you have identified and controls you have put in place.

A work health and safety inspector may ask to see a copy of your records if they visit your workplace. If you do not have a written record, you will need to demonstrate by other means how you have met your duties.

You should select a method of recording the risk management process and outcomes to suit your circumstances.

The type of information which could be recorded includes:

- the risk assessment process, including the hazards you identified, how you assessed the risks, and the control measures you implemented. For example, you can use a risk register such as the one in the Code of Practice: *How to manage work health and safety risks*
- policies and procedures
- training records
- consultation records
- inspection and maintenance records
- air monitoring records
- audits of compliance
- first aid records, and
- injury, illness and dangerous incident reports.

It is also useful to have a record of the processes used to investigate any incidents where a worker has been exposed to, or potentially exposed to, a biological hazard at work, including where they have contracted an illness or infection from a known exposure. You also need to meet the notifiable incident record keeping requirements. Refer to **Chapter 10** for more information.

Depending on your workplace and the type of work tasks undertaken you may also need to record information on the following, as relevant:

- respirator fit testing, checking and maintenance
- vaccination records, as relevant (kept confidential and not disclosed or reported without the worker's express written consent)
- microbiological testing (e.g. Legionella testing),
- staff rosters and allocations, and
- injuries/events log (including where the incident occurred and how the incident occurred).

10. Response to an exposure

10.1 If a person is exposed to a hazard at work

You should encourage workers to report an exposure, or potential exposure, to a biological hazard immediately. You should provide workers with information to help them understand what needs to be reported and how they should inform you or their manager/supervisor if it occurs. You must consider any privacy obligations you have when handling personal information from a reported exposure.

If there is an exposure, or potential exposure, to a biological hazard at work you must take reasonably practicable steps to address the risk to the person or people exposed. You must ensure you are still meeting your WHS duties while responding to an exposure, such as removing people from the workplace if the environment is no longer safe and minimising the risk of exposure to biological hazards for the people providing first aid or cleaning up (e.g. by providing appropriate PPE or utilising ventilation or air cleaning devices to remove biological hazards from the air).

Having clear policies and procedures in place which outline roles and responsibilities when an exposure, or potential exposure, occurs can ensure a rapid and appropriate response. These policies and procedures may include information on providing first aid, when to seek medical assessment, follow-up actions which should be undertaken and reporting requirements. The policies and procedures should also outline what to do and who to contact for help and support if required outside of ordinary business hours (e.g. national helpline) or when working in a remote location.

In an emergency, such as when a person is experiencing serious symptoms, call 000 for urgent medical assistance.

You must immediately notify your WHS regulator of serious incidents at work or related to work and preserve the incident site. Refer to **Section 10.3** for information on notifiable incidents.

Providing first aid

WHS Regulation 42
Duty to provide first aid

It may be necessary to provide first aid to the affected person if they have been exposed to a biological hazard or are unwell. First aid is the immediate treatment or care given to a person until more advanced care is provided or the person recovers.

You must ensure that you provide workers with first aid facilities which include:

- adequate first aid supplies – for example, appropriate dressings to cover cuts, abrasions and other non-intact skin, and
- other first aid facilities appropriate to the risk arising from the biological hazard – for example, eye wash stations for use immediately after someone's skin or eyes have been exposed to infectious substances or body substances that could cause infection (e.g. a splash of a biological sample).

First aid kits must be accessible at the workplace and should be available to all workers, including field workers. First aid kits should be suitable for the likely illnesses and injuries for the work being undertaken. For example, a bite and sting pack would be appropriate for field and remote workers to manage snake bites and remove ticks. Field and remote workers should be trained on how to use the first aid kit to manage an exposure in locations far from a hospital or medical clinic, as well as provided instruction on how to access first aid support.

You must ensure an adequate number of workers are trained to administer first aid at the workplace or that workers have access to an adequate number of other persons who have been trained to administer first aid. As a minimum, first aiders should hold nationally recognised Statement/s of Attainment issued by a Registered Training Organisation (RTO) for the nationally endorsed first aid unit of competency Provide First Aid or a course providing equivalent skills. Appropriate training is essential to minimise the risk of the first aider being exposed to biological hazards. For example, to ensure they know how to appropriately use PPE and safely dispose of contaminated waste.

First aiders should attend training on a regular basis to refresh their first aid knowledge and skills and to confirm their competence to provide first aid. Refresher training in CPR should be carried out annually and first aid qualifications should be renewed every three years.

A higher level of additional training may be required to ensure first aiders have appropriate skills for the risks you have identified in your workplace. For example, in workplaces where contact with animals is likely, first aiders should have training on how to manage animal bites or scratches, and if sharps are used in the workplace, first aiders should have training on how to manage penetrating injuries.

You must also consider the health and safety risks to those performing first aid. For example, you may need to ensure they are vaccinated against certain vaccine preventable diseases, or to provide access to counselling for first aiders following providing treatment or care to someone in the workplace.

For further information on first aid in the workplace see the Code of Practice: *First aid in the workplace*.

Seeking expert advice following exposure to a biological hazard

If a person is exposed, or potentially exposed, to a biological hazard at work, you must do all that you reasonably can to respond to the risks to their health and safety. This may include ensuring the person receives a timely medical assessment or attends the hospital emergency department as soon as possible. For some types of exposures (e.g. those with significant health risks), the person may require blood tests, post exposure treatment to prevent infection or ‘post exposure prophylaxis’ (e.g. if there has been exposure to body substances where HIV or hepatitis B are known or suspected), medical counselling and ongoing health assessment.

Depending on the type of biological hazards, you may also need to seek expert advice, such as from health authorities, on how to contain the exposure to prevent any additional people from being exposed.

If a person is unwell at the workplace with a potentially communicable disease or infection

If a person is unwell at the workplace – including workers and others – and there is a risk the biological hazard could spread to other people in the workplace (e.g. respiratory or gastrointestinal illness) you should:

- support the person to seek medical treatment where needed
- ensure the person leaves the workplace as soon as possible and does not return until they are no longer at risk of spreading the illness
- where removing the person from the workplace is not reasonably practicable, ensure they are appropriately distanced (separated) from others
- support workers to work from home (where it is possible for them to perform the requirements of their role from home and if they are well enough to do so) or take leave under their workplace entitlements
- provide suitable PPE (such as a P2/N95 respirator), as and when required, and ensure people know how to use and wear it.

You must ensure those in close contact with the unwell person are protected so far as is reasonably practicable. For example, workers who provide first aid to someone or clean up after someone who is sick.

Where a worker has disclosed that they have, or suspect they have, an infection which spreads easily to others, it may be appropriate to notify others who were in close contact with the person during the likely infectious period so that they can monitor themselves for any symptoms. You have duties in relation to worker privacy when considering notifying other workers.

Clean and disinfect any contaminated areas, materials or equipment

Where appropriate, you should close off access to any potentially contaminated areas, materials and/or equipment that pose an ongoing risk to workers and others, and ensure they are appropriately cleaned and disinfected before allowing access. In some cases, you may need to dispose of materials and equipment that is not able to be adequately cleaned and disinfected (e.g. children's toys or a computer keyboard). You may also need to remove biological hazards from the air by turning on an air purifier, increasing mechanical ventilation or opening windows to circulate fresh air into the area.

You should ensure cleaners wear PPE appropriate to the exposure risk, such as gloves appropriate to the chemicals being used, a mask and safety eyewear. If a cleaning service is provided by another PCBU, you need to make the PCBU aware of the exposure risk and follow up to ensure appropriate steps are taken to manage the risks.

Remember, you should ensure after use that PPE is either disposed of or cleaned and disinfected appropriately and according to the manufacturer's instructions and hands are properly cleaned.

Work adjustments

Workers who have been exposed to a biological hazard at work may require temporary work adjustments, for example, to allow the affected person or people to recover and receive treatment. Where appropriate, advice should be sought from the affected worker's treating medical professional about their capacity for work while they are recovering. Work

adjustments might also be needed to facilitate quarantine of an area after a biological hazard incident (e.g. allowing time for sufficient cleaning and disinfection).

Where reasonable and possible, you should support work adjustments such as changes to work location, work tasks or leave considerations under workplace entitlements to manage risk to the person or people exposed and to prevent further exposures in the workplace. You must collaborate with the worker and adhere to any relevant legislation when determining what appropriate measures to put in place, such as reasonable adjustment provisions in the disability discrimination legislation.

You must ensure that you manage any additional WHS hazards that may arise from worker adjustments.

Review risk management control measures

If exposure to a biological hazard occurs, you need to review your control measures to ensure you are doing everything reasonably practicable to manage the risks. You will need to assess and decide whether any changes or additional control measures are required. See Chapter 5 of this Code for further guidance.

10.2 Emergency plans

> **WHS Regulation 43**
> Duty to prepare, maintain and implement emergency plan

Regardless of control measures put in place to prevent incidents occurring in your workplace, they can still occur. For example, sprays of body substances when working with people or animals or sewage backflows in buildings. It is therefore necessary to be prepared to respond in an emergency situation when a biological hazard poses a significant threat to the health and safety of workers and others at the workplace.

You must ensure that an emergency plan is prepared and maintained for the workplace that includes:

- an effective response to an emergency
- evacuation procedures
- notifying emergency service organisations at the earliest opportunity
- medical treatment and assistance, and
- effective communication between the person you have authorised to coordinate the emergency response and all persons at the workplace.

In developing your emergency plan, you must have regard to the nature of work being carried out and the hazards at the workplace. You must also consider the workplace's size and location, and the number and composition of workers and other persons at the workplace. For example, a laboratory working with hazardous biological materials will need an emergency plan that outlines the response arrangements if there is an uncontrolled escape, spill or leakage of a biological hazard. You should also consider the need to notify workers who are working offsite or remotely of any incident or emergency that may prohibit re-entry to the workplace.

In some circumstances, you may have a duty to notify the WHS regulator that an incident has occurred at your workplace (see **Section 10.3** for further information on notifiable incidents). You should reflect these requirements in your emergency plan.

You must also identify how (and how often) you will test the effectiveness of your emergency plan, and how the relevant information, training and instruction about the emergency plan will be provided to workers. These plans should be easily accessible to workers, regularly reviewed and updated so they remain effective over time.

Further guidance on emergency plans and preparing emergency procedures is available in the Code of Practice: *Managing the work environment and facilities*.

10.3 Notifiable incidents

WHS Act Part 3
Incident notification

WHS Regulation 699
Incident notification – prescribed serious illnesses

You must immediately notify your WHS regulator of serious incidents related to work. These **'notifiable incidents' capture situations involving deaths, serious injuries and illnesses and dangerous incidents.** Notifiable incidents may relate to any person in the workplace – including workers, contractors, volunteers and members of the public.

Notification ensures that serious incidents are properly addressed and any work systems or work-related issues contributing to the incident can be identified and fixed to prevent similar incidents from happening in the future.

Notifiable incidents in relation to biological hazards include:

- Injuries or illnesses that require (or would usually require) medical treatment within 48 hours of **exposure to a substance**. For example, a healthcare worker, who has no immunity against hepatitis B, getting a small amount of blood in their eye while treating a patient.
- **Infections** to which the carrying out of work is a significant contributing factor, including those which are reliably attributable to work involving (but not limited to):
    - handling of microorganisms
    - providing treatment or care to a person
    - contact with human blood or body substances
    - handling or having contact with animals or animal biological material (see more information below).

- Certain **occupational zoonoses** *contracted in the course of work* involving handling or contact with animals, animal hides, skins, wool or hair, animal carcasses or animal waste products:
    - Q fever.
    - Anthrax.
    - Leptospirosis.
    - Brucellosis.
    - Hendra virus.
    - Avian influenza.
    - Psittacosis.
- An **uncontrolled escape, spillage or leakage of a substance** that expose a person to an immediate or imminent serious risk to their health or safety, such as laboratory cell cultures.

You must preserve the incident site so far as is reasonably practicable until an inspector arrives or directs otherwise. However, this does not prevent taking actions to help an injured person, remove a deceased person, make the site safe to minimise the risk of further incidents (e.g. turning off equipment or cordoning off areas), or to facilitate a police investigation.

Contact your WHS regulator for advice on what is notifiable and how to make a notification.

Some conditions or diseases may also be subject to health reporting requirements or additional obligations under public health laws – refer to the Department of Health in your jurisdiction. Notification must be made to the WHS regulator if the infection or zoonoses meets the notification threshold regardless of the involvement of any other processes or authorities, or notification to other bodies.

Further information on notifiable incidents can be found in the *Notifiable Incidents, Extended Absences and Suicides Handbook*.

Appendices

APPENDIX A – Checklist: Managing the risks of biological hazards at work

Biological hazards are substances and agents of biological origin, such as from humans, plants and animals, that pose risks to human health. They include viruses, bacteria, parasites, prions and some types of fungi (including mould). They also include allergens, irritants and toxins, such as organic dust, sap and venom.

You must always aim to ***eliminate*** risks. Given the nature of biological hazards, elimination may not be possible for many workplaces. If you are not reasonably able to eliminate risks, you must ***minimise*** the risks as much as you reasonably can.

This checklist provides a summary of key considerations when managing the risks of biological hazards at work and includes references to relevant chapters in the Code for further information. This checklist provides high-level guidance only and should be adapted for your circumstances. As you work your way through the risk management process you should seek information and advice from authoritative sources about risks and control measures relevant to your particular industry, sector or work activity. Examples of authoritative sources can be found in **Appendix J**.

STEP 1: UNDERSTANDING BIOLOGICAL HAZARDS (see Chapter 1)
Before commencing the risk management process, you must first understand where biological hazards can be found in your workplace, how people may be exposed to them and the harm they can cause.

a. **Do you understand the different sources of biological hazards in the workplace?** ☐
For example, another person, an animal, human or animal biological material, a vector, contaminated material or organic material.

b. **Do you understand how workers are exposed to biological hazards at work?** ☐
For example, through person-to-person contact, animal-to-person contact, contact with human or animal biological material, a penetrating injury, transmission through the air, vector transmission or contact with contaminated materials.

c. **Do you understand how biological hazards can enter the body?** ☐
For example, through inhalation, ingestion, contact with the eyes, nose, ears, mouth or skin, or through broken or damaged skin.

d. **Do you understand how biological hazards can cause harm?** ☐
For example, the different types of injury, illness and disease they can cause.

STEP 2: IDENTIFYING BIOLOGICAL HAZARDS (see Chapter 4)
The first step in the risk management process is identifying all reasonably foreseeable biological hazards arising from the work carried out by your business or undertaking.

a. Have you considered the common sources of biological hazards in your industry and how people are exposed to them? ☐

b. Have you considered and observed whether the work activities create a risk of exposure to biological hazards? ☐
For example, does the work involve close contact with people or human biological material, close contact with animals or animal biological material, contact with organic materials, contact with sharps, or the generation of dust or aerosols?

c. Have you considered and observed whether the work environment creates a risk of exposure to biological hazards? ☐
For example, does the work occur in higher risk locations (e.g. where vectors may be present), is there good air quality in the workplace, and are there adequate and hygienic facilities in the workplace?

d. Have you reviewed internal records and data? ☐
For example, records of notifiable injuries and incidents, workers' compensation claims, feedback from workers and HSRs, and reports from workplace inspections and risk assessments undertaken.

STEP 3: CONSULTATION (see Section 2.5)
You must consult with relevant workers and their elected health and safety representatives (if any) about health and safety matters so far as is reasonably practicable. You should ensure consultation is accessible for all workers, including workers from culturally and linguistically diverse backgrounds.

a. Have you consulted with workers about risks? ☐
For example, about their experience with exposures or potential exposures to biological hazards at work.

STEP 4: ASSESSING THE RISKS (see Chapter 5)
Once you have identified the biological hazards, the next step is to assess the risks they create.

a. Have you considered the likelihood of people being exposed to biological hazards at work? ☐
For example, have you considered the nature of the biological hazard, source/s and exposure?

b. Have you considered the possible consequences of people being exposed to biological hazards at work? ☐
For example, if there are people at higher risk of severe harm, and if exposure could cause severe injury or illness, or be fatal?

c. Have you considered the effectiveness of existing control measures in eliminating or minimising the risks of each biological hazard? ☐
For example, what you already have in place to control the risks, and the availability, use and effectiveness of control measures and medical treatments.

STEP 5: CONTROLLING THE RISKS (see Chapter 6)
As part of assessing the risks you will have considered the effectiveness of existing control measures. The next step is to determine what further action is required to control any remaining risks. In most cases you will need to use a combination of control measures to effectively manage the risks of biological hazards in your workplace.

a. Elimination: Can you eliminate the risk of exposure to the biological hazard in your workplace? ☐
[Note: Given the nature of biological hazards, elimination may not be possible for many workplaces. If this is the case, you must minimise the risk. Working through the hierarchy of controls below will assist you.]

b. Substitution controls: Can you minimise the risk of exposure by replacing a hazard or hazardous work practice with one which presents a lower risk? ☐
For example, replacing a higher risk work activity with one that is lower risk, or replacing a higher risk material or product with one that is lower risk.

c. Isolation controls: Can you minimise the risk of exposure by physically separating the source of harm from people by distance or using barriers? ☐
For example, moving high-risk work activities away from other work areas, or separating people from the biological hazard source.

d. Engineering controls: Can you minimise the risk of exposure by putting in place physical control measures, including using mechanical equipment or processes? ☐
For example, using different equipment or systems, or ensuring adequate facilities and environment are available to lower the risk.

e. Administrative controls: Can you minimise risk by implementing policies or procedures, or providing information, training, instruction or supervision? ☐
For example, encouraging vaccination and workplace hygiene, implementing cleaning and disinfection processes, or implementing inspection and maintenance programs.

f. Personal Protective Equipment (PPE): Can you minimise risk with suitable PPE? ☐
For example, gloves, masks, face shields or protective clothing.

g. Have you consulted with workers about control measures? ☐
For example, about what control measures are most suitable for your workplace and your workers.

STEP 6: INFORMATION, TRAINING, INSTRUCTION AND SUPERVISION (see Chapters 2 and 7)
You must provide any information, training, instruction or supervision that is necessary to protect workers from exposure, or potential exposure, to reasonably foreseeable biological hazards at work. You must ensure that the information, training, instruction or supervision provided is suitable and adequate for your workers.

a. **Have you provided information to workers on the potential biological hazards in the workplace?** ☐
For example, the sources of biological hazards, how workers are exposed to them and the potential harms.

b. **Have you provided information to workers about the measures in place to control risks?** ☐

c. **Have you provided information to workers about the work policies and procedures that must be followed?** ☐
For example, reporting requirements in the event of an exposure.

STEP 7: MAINTAINING AND REVIEWING CONTROL MEASURES (see Chapters 7 and 8)
You must maintain and regularly review the control measures to ensure they work as planned and revise as necessary.

a. **Do you have a schedule for routine checks and maintenance of control measures to ensure they remain effective?** ☐

b. **Do you have a process in place for reviewing control measures?** ☐
For example, inspecting the workplace, observing work tasks, consultation, or analysing records and data.

STEP 8: RECORDING YOUR RISK MANAGEMENT (see Chapter 9)
Keeping records of your risk management process and outcomes allows you to demonstrate how you have met your WHS duties. You should select a method of recording to suit your circumstances.

a. **Have you recorded key information which allows you to demonstrate you have met your duties?** ☐
For example, have you recorded your policies and procedures, training delivered, and consultation undertaken.

APPENDIX B – Glossary

Term	Definition
Aerosols	Microscopic liquid or solid particles suspended in the air.
Airborne	Transported by air.
Airborne contaminant	A fume, mist, gas, vapour or dust suspended in the air that can be harmful to health when breathed in. They may not be visible to the naked eye or detected by odour.
Alcohol based hand rub or hand sanitiser	An alcohol containing preparation used for hand hygiene to inactivate some types of biological hazards on the hands without the need to use soap and water.
Animal dander	Small flecks of skin shed by animals with fur, hair or feathers.
Biological hazard	Substances and agents of biological origin, such as from humans, plants and animals, that pose risks to human health. They include viruses, bacteria, parasites, prions and some types of fungi (including mould). They also include allergens, irritants and toxins, such as organic dust, sap and venom.
Blood	Human or animal blood, blood components and products made from blood.
Communicable disease	An infectious disease which can spread to people from another person or an animal. These diseases may also be referred to as contagious diseases.
Contaminated	Having been made dangerous by the presence of foreign or harmful substances.
Control measure	An action taken to eliminate or minimise health and safety risks so far as is reasonably practicable.
Disposable equipment	Equipment designed to only be used once before being disposed of. This equipment may also be referred to as single use.
Duty holder	Any person who owes a work health and safety duty under the WHS laws including a person conducting a business or undertaking, a designer, manufacturer, importer, supplier, installer of products or plant used at work (upstream duty holder), officer or worker.
Epidemic	A widespread outbreak of disease in a community or population which occurs at a certain time and is not ongoing
Exposure standard	Means an exposure standard in the *Workplace Exposure Standards for Airborne Contaminants.* It represents the airborne concentration of a particular substance or mixture that must not be exceeded.
Hazard	A situation or thing that has the potential to harm a person.
Health	Health includes both physical and psychological health.
Health and safety representative (HSR)	A worker who has been elected by their work group under the WHS Act to represent them on health and safety matters.

Immune response	Is the body's coordinated defensive reaction against foreign or harmful substances, such as biological hazards
Infectious	A microorganism capable of invading a susceptible host and multiplying in it, which may or may not cause a disease.
Infectious disease	A disease caused by an infectious agent or its products.
May	'May' indicates an optional course of action (i.e. you may consider using posters to encourage good hand hygiene in bathrooms).
Must	'Must' indicates a legal requirement exists that must be complied with (i.e. you must eliminate or minimise health and safety risks).
Officer	An officer under the WHS Act includes: • an officer within the meaning of section 9 of the Corporations Act 2001 (Commonwealth) • an officer of the Crown within the meaning of section 247 of the WHS Act, and • an officer of a public authority within the meaning of section 252 of the WHS Act. A partner in a partnership or an elected member of a local authority is not an officer whilst acting in that capacity.
Organic dust	Particles containing materials that originate from plants or animals and may become airborne when disturbed. They include cotton, grain, hay, flour and wood dusts, animal dander and mould that grows in vegetable matter.
Person Conducting a Business or Undertaking (PCBU)	PCBU is a broad term used to capture all types of working arrangements or structures. A PCBU can be a company, unincorporated body or association, or self-employed person. If a business or undertaking is conducted by a partnership, each of the partners is individually a PCBU. A volunteer association or elected members of a local authority will not be a PCBU.
Personal protective equipment (PPE)	Anything used or worn by a person to minimise the risk to the person's health and safety.
Precautionary approach	Taking preventative action to manage the risks of a biological hazard when there is uncertainty about the potential harm it could cause.
Primary duty	Under the WHS laws a PCBU must ensure, so far as is reasonably practicable, the health and safety of: • workers engaged, or caused to be engaged by the person; and • workers whose activities in carrying out work are influenced or directed by the person, while the workers are at work in the business or undertaking. They must also ensure the health and safety of other persons. Further information can be found in **Chapter 2**.

Psychosocial hazards	A hazard that may cause psychological harm (whether or not it may also cause physical harm). They arise from or relate to the design or management of work, the work environment, plant at a workplace, or workplace interactions or behaviours.
Respiratory particles	Particles, such as saliva, mucus or other matter, from the respiratory tract that can be expelled through the mouth or nose. This can be through activities such as coughing, sneezing, breathing, talking, singing and spitting.
Respiratory protective equipment (RPE)	Equipment designed to prevent a person wearing the equipment from inhaling airborne contaminants. RPE is a form of personal protective equipment (PPE).
Risk	The possibility that harm (death, injury or illness) might occur when exposed to a hazard.
Sharps	Items with sharp points or edges that can puncture, pierce or cut skin.
Should	Indicates a recommended course of action.
So far as is reasonably practicable	Means doing as much as you are reasonably able to ensure health and safety, taking into account and weighing up all relevant matters including: • the likelihood of the hazard or risk occurring • the degree of harm that might result from a hazard or risk • what the person concerned knows, or ought to reasonably know, about the hazard or risk, and about the ways of eliminating or minimising the risk • the availability and suitability of ways to eliminate or minimise risk, and • the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.
Transmissible	Able to be passed on from one person or animal to another or between species.
Vector	An insect or animal which can carry a biological hazard. They include mosquitoes, ticks, fleas, mites and cockroaches.
Vulnerable person	A person who may be more likely to experience severe illness after an exposure to a biological hazard, such as someone who is immunocompromised due to an existing medical condition.
Worker	Any person who carries out work for a person conducting a business or undertaking, including work as an employee, contractor or subcontractor (or their employee), self-employed person, outworker, apprentice or trainee, work experience student, employee of a labour hire company placed with a ‘host employer’ or volunteer.
Workplace	Any place where work is carried out for a business or undertaking and includes any place where a worker goes, or is likely to be, while at work. This may include offices, factories, shops, construction sites, vehicles, ships, aircraft or other mobile structures on land or water.
Zoonotic disease	Is an infectious disease that can spread from animals to humans

APPENDIX C – Ventilation and air cleaning

Ventilation

Ventilation allows the introduction or recirculation of air into and out of a workspace through natural or mechanical means. Adequate ventilation can:

- dilute the concentration of biological hazards generated by people or animals which travel through the air in indoor spaces, such as infectious respiratory particles containing viruses or bacteria emitted by occupants of the space
- reduce the build-up of biological hazards generated by work activities in the air where people are working, such as organic dust and airborne allergens, and
- maintain humidity and reduce condensation to reduce mould or bacterial growth and damp conditions within the space.

As a PCBU you have an obligation to ensure the ventilation at your workplace enables workers to carry out work without risk to their health and safety. There are a range of different ventilation systems, and you need to use the ones that suit your workplace, the tasks your workers carry out and the biological hazards which they may be exposed to.

You should ensure ventilation in your workplace complies with Australian national standards and Codes, such as the AS/NZ 1668 series[2]. It may not always be reasonably practicable to retrofit a space to comply with current ventilation standards. Where this is the case, alternative ventilation options can be used, such as local exhaust ventilation.

PCBUs designing structures that will be used at a workplace have a duty of care to ensure, so far as is reasonably practicable, that the structure is designed without risks to health and safety (WHS Act section 22). This includes considering the ventilation needs of the building and its occupants as part of creating a safe working environment.

> Ventilation is an **engineering control** which will typically dilute contaminated air. You must consider what other controls you may need to implement alongside ventilation to effectively manage the risks of biological hazards in your workplace.

Natural ventilation

Natural ventilation can help reduce the risk of exposure to biological hazards in outdoor settings and in large open buildings. However, its effectiveness is dependent on the quality of the outside air, weather, and wind direction and speed.

In an indoor setting, natural ventilation involves using passive airflow to bring outside air into a building. When the outside air is cleaner than the inside air, you can implement natural ventilation by opening doors, windows or vents, where it is safe to do so. Natural ventilation is not suitable when there are high levels of pollution outside (e.g. emissions from vehicles or industry, or smoke from bushfires). Opening doors and windows on opposite sides of the room increases airflow through cross ventilation - air entering on one side, crossing the room

[2] Includes AS/NZ 1668.2:2024 *The use of ventilation and air conditioning in buildings Part 2: Mechanical ventilation in buildings* and AS/NZ 1668.4:2024 *The use of ventilation and air conditioning in buildings Part 4: Natural ventilation of buildings*

and exiting the other side. While air flow is important, avoid air flow that directs air from one person directly towards another. Factors such as the location and size of openings and the placements of items (e.g. furniture and pillars) can all impact the level of natural ventilation you can achieve. In general, natural ventilation in an indoor setting works best in dry, temperate conditions.

When using natural ventilation as a control measure, you must manage any risks associated with its implementation. When working outside, you need to ensure that air containing biological hazards (e.g. organic dust) does not travel in the direction of other workers or workplaces. When working inside, you need to ensure the air circulated via natural ventilation does not bring other contaminated air pollutants into the workplace (e.g. dust or pollen).

The below case studies illustrate how natural ventilation can be implemented to minimise the risk of workers being exposed to biological hazards.

Case study 16 - Visitor information centre worker
Jane commences a job at a visitor information centre which is only open during the peak tourist season in spring and summer when the weather is typically dry and temperate. Her work involves interacting with tourists during the day and providing recommendations on attractions to see in the local area.

Jane is concerned about the risk of exposure to communicable diseases which are transmitted through the air. The old building the visitor information centre is located within does not allow for mechanical ventilation to be installed, but it has large windows and doors. The PCBU consults with Jane, and they agree using natural ventilation to dilute the concentration of respiratory particles generated by tourists in the centre is a reasonably practicable control measure they can implement to manage the risks. As such, when the weather conditions are appropriate, Jane opens the doors and windows to allow a cross breeze through the centre.

Case study 17 - Sheep shearer
Joe owns a sheep station and is considering ways to reduce the risk of zoonotic diseases which the sheep shearers may be exposed to when breathing in contaminated air. One of the possible control measures he considers is ventilation.

Joe consults with the sheep shearers who suggest that on dry, temperate days the sheep can be shorn in the open undercover space adjacent to the main building. He agrees to this suggestion but, to reduce the risk of hazards associated with sun exposure, instructs that the shearing must be conducted under the shelter.

Joe is satisfied that this change to the process will improve the natural ventilation and, alongside other reasonably practicable control measures, will manage the risk of sheep shearers being exposed to biological hazards.

Mechanical ventilation

Mechanical ventilation may be needed to manage risks, such as in enclosed spaces without the means to achieve adequate natural ventilation, where large concentrations of biological hazards are present, in humid environments or where people are working directly with a biological hazard.

Mechanical ventilation is the active process of supplying air to, or removing air from, an indoor space by powered air movement components. Where practical, a ventilation system should operate exclusively for the particular workplace or a space within the workplace. If this is not practical, the system may be linked to another area provided this does not increase the risk of exposure. For example, air should not be recirculated if there is risk of moving airborne biological hazards to another area where they are not present.

Some examples of mechanical ventilation options are outlined below. This is not an exhaustive list. You may need to consult a technical specialist, such as a ventilation engineer or an occupational hygienist, on mechanical ventilation options to manage the risks of biological hazards in your workplace.

Heating, ventilation and air conditioning (HVAC) systems

Heating, ventilation and air conditioning (HVAC) systems are designed primarily to provide thermal comfort, however, they can contribute to minimising the concentration of airborne biological hazards through:

- diluting airborne contaminants by bringing fresh air into a space
- removing contaminated air by exhausting it out of a space, and
- helping to maintain optimal temperature and humidity levels and prevent mould growth.

To be most effective as a control to manage risks arising from biological hazards, HVAC systems should maximise fresh, clean air supply and not recirculate air. HVAC systems can also be fitted with some form of filtration to clean the air that circulates through the system, such as high-efficiency particulate air (HEPA) filters which remove particles (e.g. pollen, animal dander, dust and mould spores) from the air. Further information can be found in the **air cleaning** section.

To be an effective control measure, HVAC systems should be well maintained and regularly serviced in accordance with manufacturers' instructions or industry guidance or standards. HVAC systems which are not appropriately cleaned and tested to ensure they are in good working order can contribute to poor indoor air quality and mould growth. Periods of shut down can also cause corrosion on surfaces that have not been chemically treated, allowing biological hazards (e.g. bacteria) to grow in stagnant water. You must do all that is reasonably practicable to manage these risks so HVAC systems do not become a source of biological hazards.

Local exhaust ventilation

Local exhaust ventilation (LEV) is designed to remove airborne contaminants from the air before they reach the breathing zone of workers. It is most effective as a control when it is applied close to the source of the biological hazard, so it can be removed before it has a chance to spread throughout the space.

A simple LEV system most commonly consists of:

- an extraction hood (fixed, portable or flexible) to capture and remove contaminated air near the point of release
- ducting to connect to an air-cleaning system
- a fan to move the air through the system, and
- an exhaust stack outside the building to disperse the cleaned air.

To be most effective and minimise the generation of other WHS risks, LEV should undergo regular maintenance and inspection.

The below case study illustrates how LEV can be implemented to minimise the risk of workers being exposed to biological hazards.

Case study 18 – Laboratory technician
A university is considering the activities which may expose its laboratory technicians to biological hazards and possible control measures to minimise the risk. They consult with David, one of the laboratory technicians, who advises that preparing bacterial cultures for classes is a frequently performed task, where some of the processes involved have a risk of aerosolising the bacteria. In response, the university purchases a biological safety cabinet (BSC), a type of LEV, to protect laboratory technicians and the surrounding environment from exposure to these biological hazards.

Before allowing David and other workers to use the BSC, the university provides them with training on how to use it safely. This includes information on operating the BSC correctly and the other control measures to manage risks, such as the PPE needed when using the BSC. The university also develops a schedule to ensure the BSC is regularly maintained and inspected to ensure it is functioning correctly and safely.

Mixed-mode and hybrid ventilation

Mixed-mode and hybrid ventilation both use a combination of natural and mechanical ventilation to dilute the concentration of airborne biological hazards in the workplace.

- **Mixed-mode ventilation** uses both natural and mechanical ventilation systems separate from each other. For example, an office building which has an HVAC system and where occupants can open windows for natural ventilation.
- **Hybrid ventilation** uses both natural and mechanical ventilation in an integrated system. For example, a building with an automated system which switches between natural and mechanical ventilation based on weather conditions and indoor air quality.

Air cleaning

Unlike ventilation, which introduces or recirculates fresh air into and out of a workspace, air cleaning filters or devices may assist to remove particles from the air present in a space.

The use of air cleaning filters or devices can be considered in addition to ventilation for settings with an elevated risk of people being exposed to biological hazards. For example, workplaces where there is a high risk of respiratory disease transmission.

If using air cleaning filters or devices as a control measure, you will need to consider what device and/or filter is appropriate for your workplace (e.g. the size of the space), the work activities undertaken and the risks arising from biological hazards present. For example:

- portable air cleaning devices can be used to draw air through a series of filters to remove particles before releasing cleaned air. The cleaned air can be recirculated back into a room or can be ducted as exhaust air to the outside,
- HEPA filters can be used to filter particles, such as pollen, animal dander, dust and mould spores. HEPA filters can be installed into HVAC systems and portable air cleaning devices to improve indoor air quality when the system is operating, however, they must be correctly installed and sealed, and
- energy based filtration systems, such as Ultraviolet C, can inactivate airborne biological hazards (e.g. viruses, bacteria and fungi).

The below case study illustrates how HVAC systems, alongside natural ventilation and air cleaning, can be implemented to minimise the risk of workers and others being exposed to biological hazards.

Case study 19 – School
Michael is a principal at a school. Prior to school resuming following the summer break he is considering what control measures should be implemented to manage the risks of biological hazards. He asks the maintenance worker to organise for a technician to service the HVAC system used in the building, which was turned off for several weeks over summer, to make sure it doesn't pose a risk to the teachers or students.

When teachers return to work, Michael will encourage them to use natural ventilation in classrooms by opening the windows and doors on days when the weather permits and the outside air is likely to be cleaner than the inside air (e.g. there is no visible smoke, dust, pollen or pollution in the air).

In response to an increase in communicable disease transmission in winter the previous year, Michael also asks the school maintenance worker to purchase air purifiers to put in classrooms to supplement the HVAC system over the colder months when opening windows and doors may not be practical. Once installed, teachers will be trained on how to use the air purifiers and the benefits to their health. They will also be given the opportunity to provide feedback on the implementation of the air purifiers, including any issues they may be experiencing (e.g. noise or drafts).

Michael also asks the school maintenance worker to develop a schedule to ensure the air purifiers and HVAC systems are regularly maintained and the filters are replaced.

Monitoring indoor air quality

Monitoring the quality of indoor air can assist you to determine the effectiveness of your ventilation and air cleaning controls in managing the risk of biological hazards in your workplace. You can screen and assess the quality of air in your workplace by:

- Considering **Air changes per hour (ACH)** - which refers to the number of times the volume of air in a space is completely replaced per hour. Measuring a workspace's ACH can help you determine how effective the ventilation in that space is.

- Monitoring **carbon dioxide (CO_2) levels** – CO_2 levels, measured with a CO_2 monitor, can indicate the presence of people and the adequacy of ventilation. Higher levels of CO_2 can identify poorly ventilated areas with people present.
- Measuring **particulate matter ≤2.5 microns (PM2.5)** - PM2.5 are very small particles found in the air. They can indicate airborne pollutant load and viral transmission risk, especially in enclosed environments.
- Undertaking **microbiological testing** by collecting air samples to determine the airborne concentration of biological hazards.
- Using **devices**, such as anemometers, which measure air speed and direction, to help you determine areas without adequate air flow.

You can consult a technical specialist, such as a ventilation engineer or an occupational hygienist, on the best way to monitor the air quality and effectiveness of ventilation and air cleaning controls in your workplace.

APPENDIX D – Cleaning and waste management

Cleaning, disinfection and sterilisation

Cleaning, disinfecting and sterilising processes are necessary to remove biological hazards from contaminated surfaces that people may have contact with.

Cleaning means to physically remove contamination, including biological hazards, from surfaces using a detergent and water solution. Cleaning reduces the number of organisms from a surface but doesn't kill them.

Disinfecting means using chemicals or heat to kill or inactivate biological hazards on surfaces. Disinfection reduces the number of organisms but may not kill them all. It is important to clean before disinfecting as dirt and grime can reduce the ability of disinfectants to kill bacteria and viruses. Disinfectants require adequate contact time to be effective. Always follow the manufacturer's instructions on the correct way to use a disinfectant.

Sterilisation means killing all organisms and bacterial spores on a surface or in liquids. This can be achieved through a variety of methods including heat, ethylene oxide gas, and vaporised hydrogen peroxide.

Cleaning and disinfection

How often the workplace and equipment will need to be cleaned and disinfected will depend on the individual circumstances of your workplace, including what risks arising from biological hazards are present, the work activities performed and any industry specific requirements (e.g. in healthcare settings and the food industry). For example, some equipment may need to be cleaned and disinfected after each use, while other equipment may only need to be cleaned once a week or on an ad hoc basis (for example, infrequently used equipment).

You can use a risk assessment to determine how a cleaning and disinfection schedule fits into your risk management plan. The schedule should outline the frequency and method of cleaning and disinfection, as well as any ad hoc cleaning requirements, which have been identified as appropriate for your workplace.

In some circumstances, there may be specific cleaning and disinfection requirements and recommendations for your workplace, such as state and territory education department cleaning requirements for schools. There may also be guidance available from relevant authorities (e.g. health departments) on recommended solutions or concentrations for disinfection for particular biological hazards, such as for some viruses and bacteria which are resistant to disinfectants.

When using cleaning and disinfectant products, the manufacturer's instructions must be followed as certain chemicals may present a hazard if mixed or used or stored incorrectly. For example, the Safety Data Sheet (SDS) and label might report that a cleaning agent has potential skin irritation effects and may create a toxic gas when in contact with certain other chemicals. You must manage risks to health and safety associated with using, handling, generating or storing a hazardous chemical at a workplace. This may require you to implement control measures such as ensuring the chemical is kept away from incompatible materials and that workers use PPE (e.g. protective clothing and gloves). The

manufacturer’s instructions will also provide guidance for correct application and contact time to ensure the cleaning and disinfectant products are effective.

Where non-disposable equipment is used, you must clean and disinfect it per the manufacturer's instructions. Equipment and tools should be cleaned after there has been potential contamination or when they are visibly soiled. Items which are deemed to be single use by the manufacturer should be discarded after use.

In most cases, items should be thoroughly cleaned before undergoing disinfection. Cleaning should begin with the least soiled surfaces (e.g. surfaces that are not as visibly dirty or are unlikely to be contaminated with a biological hazard) and progressively move towards the dirtiest surfaces to prevent transferring contamination to cleaner areas. Working from high surfaces to low surfaces can also prevent cross contamination.

When surfaces are cleaned, they should be left as dry as possible to reduce additional risks which may arise from the cleaning, such as wet floor surfaces creating the risk of slips and falls. Appropriate signage should be displayed during and after cleaning floors to provide caution of the slip risk.

> There may be circumstances where specific cleaning methods are needed to manage the risks arising from a biological hazard at work. For example, cleaning mould off a surface will require different cleaning techniques to those used when cleaning that same surface under typical conditions (without mould). You should consider what cleaning methods will be most effective and the requirements for performing these safely. You may also need to consider outsourcing cleaning to a specialist.

Cleaning methods should minimise the generation of droplets (e.g. sprays and splashes) and aerosols. For example, high-pressure hosing and sweeping should be avoided where possible as they can create airborne biological hazards. Automated cleaners and washer-disinfectors can minimise contact with contaminated items, and cleaning using vacuums with a HEPA filter can significantly reduce allergenic and irritant biological material in the workplace.

You may need to develop a roster for workers to undertake cleaning in the workplace. If workers are undertaking cleaning duties the appropriate cleaning equipment, suitable PPE and training must be provided. Training should include information on what chemicals they are using and if there are any health risks, how to properly clean and disinfect the surface or equipment, how to use the cleaning equipment provided, and how to avoid cross contamination.
When cleaning, cross contamination occurs if biological hazards are transferred from one surface or object to another. For example, if after cleaning dog vomit from the floor in a veterinary clinic a worker does not remove their dirty gloves before exiting the room, they can contaminate surfaces and objects (e.g. door handles and benchtops) with the dog vomit which may be touched by another person. Practicing good hygiene and ensuring the appropriate use of PPE when cleaning minimises the risk of cross contamination.

In some workplaces it may not be appropriate to require workers to undertake cleaning (e.g. if workers are sensitive to biological hazards or cleaning products). In these situations, you would need to engage a suitable cleaner to undertake this work.

Sterilisation

There may be circumstances where cleaning and disinfecting alone will not be sufficient to manage the risks, and you may also need to sterilise equipment and surfaces. This includes, but is not limited to, the reusable equipment used in:

- skin penetration procedures, such as tattoo barrels
- personal appearance services, such as cuticle cutters and tweezers
- dental and medical procedures, such as speculums, endoscopes and dental mirrors, and
- laboratory settings, such as test tubes and scalpels.

Similar to disinfection, items that need to be sterilised should be pre-cleaned to remove any dirt and grime that may interfere with the sterilisation process. You must sterilise surfaces and equipment per the manufacturer's requirements. There may also be relevant standards and guidance available from relevant authorities (e.g. dental guidelines on sterilisation).

Sterilisation procedures can vary depending on the workplace. Workers who conduct sterilisation procedures must be provided appropriate information, training and instruction.

If you determine that sterilisation is necessary to manage the risks arising from biological hazards in your workplace, but it is not reasonably practicable to do so, single use equipment should be used.

Cleaning and reusing equipment

Disposable equipment can reduce the likelihood of biological hazards spreading from surfaces to people. Where it is not practical to use disposable equipment, you will need to ensure equipment is cleaned thoroughly after use. For example, shared cutlery should be washed in a dishwasher. Where shared cutlery needs to be washed manually, hot water and detergent should be used.

In some cases, equipment will also need to be disinfected or sterilised before it is used again. Equipment should be disinfected or sterilised in accordance with the manufacturer's instructions. Once clean, items should be stored in a clean and dry environment. You should ensure wet items are dried before storing (e.g. mops and brushes).

The level of cleaning, and possible disinfection and sterilisation, needed for equipment will depend on the type of equipment, the level of contamination, the nature of the biological hazard and the intended use of the equipment. Equipment labelled/manufactured as single use should not be cleaned and reused.

Workplaces where medical, surgical and other invasive equipment is used will likely require sterilisation or greater levels of cleaning and disinfection as a routine measure and may have applicable standards which should be followed. This includes in healthcare settings, dental services, veterinary practices, personal appearance services and the funeral industry.

Spills management

You may need to manage a biological hazard spill in your workplace. This may include human or animal waste, blood or other body substances and laboratory cell cultures. Incorrect management of contaminated, or potentially contaminated, spills increases the risk of illness or disease in the workplace.

If you identify that there is a risk that biological hazards may be spilled or released, spill kits containing appropriate materials for the safe management of that spill should be available in the workplace. This may include:

- PPE
- absorbent material
- waste disposal bags or other suitable containers, and
- cleaning equipment e.g. disposable cleaning cloths, detergents and disinfectants.

You should develop procedures outlining how to manage spills in the workplace and the correct use of spill kits, with appropriate training and instruction provided to workers. These procedures should include information on spill containment steps, PPE requirements and reporting procedures.

Cleaning and/or disinfecting agents should be chosen based on the nature of the spill and its associated risks and used per the manufacturer's instructions.

You are required to notify your WHS regulator immediately after becoming aware of escapes, spillages or leaks of substances in the workplace that could expose a person to a serious risk to their health and safety. Refer to **section 10.3** of this Code for more information on notifiable incidents.

Laundry management

Used linen, including bedding, towels and clothing, can expose workers and other persons to potential biological hazards from substances, parasites (e.g. mites or lice) or items contained in linen.

Measures to manage exposure to biological hazards from used linen include:

- keeping used and unused linen separate during handling, storage and transport
    - for example, avoid transporting used and unused linen in the same vehicle, or where this is not reasonably practicable, ensure they are separated by a suitable barrier, such as separate containers or moisture impermeable bags
- ensuring containers which have been used to transport used linen are thoroughly cleaned and sanitised before being used to carry unused linen
- minimising direct contact with used linen (e.g. using automatic laundering processes for heavily contaminated linen or dissolvable laundry bags that can be placed straight into a washing machine to eliminate the need to remove items from the bag before washing)
- using colour coding to identify used linen
- ensuring used linen which requires disinfection undergoes an appropriate thermal or chemical method of disinfection for the identified biological hazard/s
- using an appropriate commercial laundry service to launder work clothing which poses a risk, instead of bringing clothing home and exposing others to the biological hazard/s
- implementing and maintaining safe systems of work for the segregation, handling, transport, storage and processing of laundry
- wearing suitable PPE when handling laundry, as appropriate to the biological hazard/s.

In addition to these controls, you should consider if there are any laundry management guidance or standards which may apply to your industry or workplace.

Waste management

Workers can be exposed directly to biological hazards or contaminated materials in waste. You should consider how you label, store and dispose of waste to minimise the risk to workers.

In most cases general waste needs to be kept separate from other waste which may contain biological hazards (e.g. clinical, garden and biosecurity), and there may be different jurisdictional requirements for how other waste is handled, stored and disposed. Measures to minimise biological hazard exposure from general waste include:

- checking whether waste can be disposed of in general waste collection by contacting the relevant environmental protection authority and/or local council
- separating waste at the point of generation where possible (e.g. into general, clinical and other waste streams) and ensuring it is disposed of quickly in an appropriately labelled and sealed container (e.g. a hard plastic container with a lid)
- putting rubbish bags in rigid wall containers to contain waste securely and minimise exposure if the bag is damaged
- ensuring good hygiene practices are used whenever workers or others have contact with general waste, including frequent hand washing with soap and water, or hand sanitiser
- ensuring waste containers are not overfilled, and routine visual inspections are conducted to ensure waste is being stored appropriately
- developing safe systems of work for the handling, storage, transport and disposal of waste
- developing protocols for managing general waste spills, and
- ensuring suitable PPE is used to minimise biological hazard exposure from general waste.

In addition to these controls, you should consider if there is any waste management guidance or standards which may apply to your industry or workplace.

Clinical waste management

Clinical waste is waste resulting from medical, nursing, dental, pharmaceutical, piercing and tattooing, veterinary practices, animal care or other related clinical activities that may pose a risk of disease transmission. It often includes:

- animal tissue
- human tissue (other than hair, teeth and nails), blood or other body substances
- discarded sharps, and
- laboratory waste.

Some clinical waste contaminated with biological hazards must be disposed of in a particular way. Your state or territory Environmental Protection Authority should be contacted for further information on what is classified as clinical waste and for advice on the recommended safe disposal method.

Measures to minimise biological hazard exposure from clinical waste include:

- separating clinical waste at the point of generation and ensuring it is disposed of in a secure and appropriately labelled puncture and leak-resistant container or is double bagged in an appropriate leak proof bag and sealed as soon as practical
- ensuring clinical waste is not manually compressed and, if automatic compaction methods are employed, ensuring aerosols are managed through appropriate containment and ventilation control measures
- ensuring clinical waste storage areas are inaccessible to unauthorised persons
- storing waste in a secure and appropriately identified container, in temperature-controlled conditions where possible, especially where collection of waste occurs less frequently
- developing safe systems of work, such as procedures for the handling, storage, transport, disposal and spill management of clinical waste
- developing protocols for managing clinical waste spills
- implementing safe systems of work for managing the risks associated with handling, emptying and cleaning reusable waste containers, and
- ensuring suitable PPE is used to minimise biological hazard exposure from clinical waste.

APPENDIX E – Good hygiene practices

Good hygiene practices are one of the most important control measures for managing the risks of biological hazards. Everyone should be practicing good hygiene in the workplace including workers, customers, volunteers and visitors.

Good hygiene practices include encouraging everyone in the workplace to:

- perform hand hygiene
- cover coughs and sneezes with their elbow or a clean tissue
- avoid touching their face, eyes, nose and mouth
- dispose of tissues and cigarette butts hygienically
- avoid sharing equipment, including desks and PPE, or where not possible, ensure they are appropriately cleaned and/or disinfected between uses
- avoid sharing food, drink and eating/kitchen utensils
- ensure food preparation and communal eating spaces are regularly cleaned, and
- disinfect and cover any cuts, abrasions and other non-intact skin with a water resistant dressing.

You may need to establish decontamination zones in your workplace to ensure workers have an appropriate place to shower and change after possible contamination with a biological hazard.

The uptake of good hygiene practices in the workplace can be encouraged by communicating to workers why they are important and how they can be implemented, using signage and visual cues to remind workers of the practices (e.g. a poster explaining how to properly wash hands displayed at sinks), ensuring workers have their own equipment where possible (e.g. tools and devices) and peer modelling and supervisor reinforcement of positive behaviour.

Hand Hygiene

A person may become ill if they touch a surface contaminated with a biological hazard and then touch their mouth, nose or eyes before cleaning their hands. They may also contaminate another surface or object by touching it, putting others at risk.

Hand hygiene is a general term referring to any action of hand cleaning. Hand hygiene includes:

- applying an alcohol-based hand rub to the surface of hands (including liquids, gels and foams), or
- washing hands with the use of water and soap or a soap solution, either non-antimicrobial or antimicrobial.

When performed correctly, hand hygiene effectively reduces biological hazards on hands.

Good hand hygiene practices include instructing a person to clean their hands:

- before and after eating, drinking, smoking, vaping and food preparation
- before and after touching wounds
- after using the bathroom
- after coughing, sneezing or blowing nose into a tissue
- before and after activities involving contact with people, animals, human or animal bodily material and contaminated materials (e.g. surfaces, objects, soil, water and waste)
- before putting on (donning) and after removing (doffing) PPE, and
- after any other work activity where exposure to biological hazards may have occurred.

You must ensure, so far as is reasonably practicable, the provision of adequate facilities for workers. Workers should have ready access to hand washing facilities with running water, soap and hygienic hand drying facilities, such as disposable paper towels. Workers without ready access to this (e.g. field and remote workers) should be provided with portable hand washing facilities, such as a water container with soap and paper towel.

Good hand hygiene practices require a person to wash their hands regularly with soap/soap solution and water for at least 20 seconds, or to use an alcohol-based hand rub as per the manufacturer's instructions. However, where possible, hands should be washed rather than cleaned with alcohol-based hand rubs when they are visibly soiled, after using the bathroom or where specific risks arising from biological hazards exist (e.g. hands are contaminated with biological hazards where hand rubs are not effective).

Regular hand hygiene may cause skin irritation. In some cases, the skin barrier may become compromised, allowing biological hazards to enter the body through broken skin. Education about the correct use of hand hygiene products, including the correct amount of product and effective rinsing of "soaps", can greatly reduce the likelihood of skin irritation. The appropriate use of moisturising creams/lotions can also help maintain the skin barrier of workers who wash their hands regularly.

Maintaining good hand care is important for ensuring effective hand hygiene and reducing risk of exposure to biological hazards through broken skin on the hands. To support workers to maintain skin integrity you should consider:

- providing education for workers who are required to wash their hands frequently to avoid hot water and pat hands dry with paper towel rather than rub
- providing PPE for workers who may handle irritants or be required to have wet hands for prolonged periods
- avoiding using powdered disposable latex gloves
- providing soap-free wash,
- providing appropriate moisturising creams/lotions for staff who are required to wash their hands frequently, and
- providing alternative products for workers with an identified sensitivity to the products supplied.

APPENDIX F – Vaccination

Vaccination is used to prevent a person contracting an illness or disease or to lessen its severity and complications if it occurs. Vaccination may also protect other susceptible persons in the workplace by reducing the opportunities for the biological hazard to spread to other people. For example, elderly people in residential aged care facilities, immunocompromised people in healthcare settings and young children in early childhood educational settings.

Vaccination is an **administrative control** that reduces but does not eliminate the risk because:

- some vaccines only reduce disease severity
- vaccine doses are sometimes not administered within the required timeframe to prevent disease
- individuals respond differently to vaccines and develop variable levels of protection
- the protection provided by certain vaccines can reduce over time, and
- new strains of disease emerge which are not effectively targeted by existing vaccines.

Even if you determine vaccination to be a reasonably practicable control measure, you must still consider what other controls you need to implement to effectively manage the risks of biological hazards in your workplace.

Due to the type of work and where it is undertaken, some workers are at increased risk of some vaccine preventable diseases. For example, working with animals increases the risk of a person contracting Q fever and workers in schools are at increased risk of contracting whooping cough (pertussis) from sick children in their care.

The Australian Immunisation Handbook contains up-to-date specific vaccination recommendations for people at occupational risk. These occupations include:

- healthcare workers (e.g. doctors, nurses and dentists)
- people who work in childhood education and care (e.g. teachers and youth service workers)
- carers (e.g. workers in nursing homes and long-term care facilities)
- emergency and essential services workers (e.g. police, armed forces personnel and staff at correctional facilities)
- laboratory workers (e.g. workers who routinely work with specific organisms)
- people who work with specific communities (e.g. workers in remote Aboriginal and Torres Strait Islander communities)
- people who work with animals (e.g. people working in the veterinary industry, wildlife and zoo workers, farmers and abattoir workers)
- other people exposed to human tissue, blood, body fluids (e.g. embalmers and funeral workers, and tattooists and body-piercers) or sewage (e.g. plumbers).

If workers have a significant risk of acquiring a vaccine-preventable disease because of their work, you should implement an occupational vaccination program. Further information on occupations at higher risk are provided at **Appendix H**.

Recommended vaccinations for those at increased risk of vaccine preventable diseases because of their work can be found in the Australian Immunisation Handbook. Advice on work related vaccination should be sought from a medical professional, such as a General Practitioner.

However, there may be circumstances where vaccination is a legal requirement under other legislation. For more information contact your WHS regulator or health department.

Annual vaccinations, such as for seasonal influenza, can reduce the risk of biological hazards spreading in all workplaces. Encouraging and educating workers on the benefits of vaccination, for both the individual and the community, may have a positive effect on vaccine uptake. For some zoonotic diseases, vaccination of livestock can also protect workers against disease. For example, the Hendra virus vaccine can be given to horses and the leptospirosis vaccine to dogs.

Occupational vaccination programs

Implementing an occupational vaccination program may be a reasonably practicable control measure if your workers are at risk of acquiring a vaccine preventable disease due to the work performed.

You should seek appropriate public health and legal advice if considering implementing a vaccination program and ensure you consider any issues which may arise, such as workplace relations, discrimination or privacy issues. For example, some workers may not be able to be vaccinated (e.g. due to medical contraindications) or may choose not to be vaccinated.

If you decide to implement an occupational vaccination program as one of your control measures, the program should outline what vaccination will look like in your workplace. It should include:

- a vaccination policy, which has been developed in consultation with workers
- evidence-based information about vaccination which can be provided to workers
- how you will lawfully and appropriately collect and maintain staff vaccination records
- how you will provide ongoing health monitoring and booster doses to ensure immunity is maintained, and
- how you will manage the risks arising from biological hazards for workers who choose not to be vaccinated, do not respond to vaccination or are unable to be vaccinated due to medical reasons. They may involve:
    - appropriate work placement, such as risk-based work restrictions, adjustments and exclusion
    - education about the policies and procedures for avoiding risk whilst working unvaccinated
    - implementing further control measures, such as training and PPE, and
    - ensuring appropriate medical referral and advice in the event of exposure.

It takes time to develop immunity following vaccination. The period of time varies between the different types of vaccines. During the interim period where immunity is developing, PCBUs must continue to manage the risk of the worker being exposed to a biological hazard like vaccination has not occurred.

If a worker is unsure of their immune system status to a vaccine preventable disease, they may wish to seek further advice from a medical professional. If a worker refuses to provide their immunity status, they should be considered non-immune for the purpose of any risk assessments.

You must keep any information about a worker's vaccination history you have been provided confidential and ensure you comply with privacy requirements.

APPENDIX G – Personal protective equipment

Personal protective equipment (PPE) refers to anything used or worn by a person to minimise the risk to their health and safety. Wearing PPE can also minimise the risk of the wearer spreading illness or disease to someone else when they have a communicable disease.

PPE is one of the least effective controls in the hierarchy of control measures as it relies on human behaviour and supervision (e.g. to ensure it is used and worn correctly). Therefore, PPE should not be relied upon on its own and should be used as a supplement to other reasonably practicable, higher-level controls (e.g. isolating workers from the hazard, adequate ventilation, and cleaning and disinfection procedures), or if there are no other reasonably practicable control measures available.

The appropriate PPE to manage the risks of biological hazards will depend on a range of factors, including:

- the type of biological hazard
- the type and level of exposure
- the task, including:
    - what workers will touch or be close to
    - how long the task will take, and
    - the practicality of using PPE during a task
- worker demographics (e.g. if there are workers at a higher risk of developing a serious illness if exposed)
- the level of workplace or community transmission in a geographical area, if applicable
- the environmental conditions in which PPE will be worn (e.g. thermal comfort), and
- any other health and safety considerations.

For example, workers in a childcare centre supervising in the outdoor playground would not need to wear gloves when cleaning up sand the children have moved from the sandpit, provided they wash their hands afterwards, due to the low risk of exposure to a biological hazard. However, workers changing nappies would need to wear gloves regardless of the time the task takes due to the high-risk of exposure to a biological hazard.

The PPE's labelling claims is also a key consideration when deciding what PPE is suitable for workers. For example, manufacturers of P2/N95 respirators will indicate whether the respirators they produce are intended to be used:

- in a clinical setting to prevent transmission of disease between people, or
- in an industrial setting to prevent exposure to dust and small airborne particles.

If you are using PPE as a control measure, it must be provided at no cost to workers. You must ensure any PPE used by workers is the suitable size and fit, including ensuring any workers wearing tight fitting respirators have been fit tested and are trained in how to fit check their respirators. When using multiple different types of PPE to minimise risks for workers it is important to ensure they do not compromise the fit and protection of one another.

All PPE users must be provided with appropriate training and instruction on how and when to put on, wear, remove, dispose (or clean) and maintain PPE. This includes instructing workers to wash their hands after PPE is removed and between removing PPE items if contamination of the hands is likely.

You must make work adjustments for workers, if required, to ensure PPE does not give rise to further work health and safety risks. For example, workers with allergies or skin sensitivities to latex should be provided with latex-free glove options.

Prolonged use of PPE may cause workers to experience physical discomfort (e.g. respiratory or heat stress, pressure injuries and allergic reactions) particularly in hot and humid environments. This may expose the worker to a risk of psychological harm. Where prolonged use is necessary, you may need to provide workers with additional rest breaks and have protocols and education in place to assist workers to manage risks. This includes ensuring there are provisions made to allow enough time for workers to safely remove and replace the PPE.

Gloves – for example, utility gloves, disposable gloves and puncture resistant gloves

- Gloves should be used when there is a high risk of contact with biological hazards, including contact with human or animal biological material and contaminated materials (e.g. surfaces, objects, soil, food, water and waste). However, gloves are not a substitute for washing hands or using hand sanitiser.
- The different types of gloves available for use are made of different types of material (e.g. poly-vinyl chloride, latex, nitrile or neoprene). The type of gloves selected must be suitable for the type of biological hazard and the task. For example, gloves selected to protect workers' hands from exposure to human blood will be different to gloves selected to protect workers from a sharps injury.
- Gloves should be replaced regularly. Disposable gloves should not be reused, and multi-use gloves should not be shared between workers (e.g. gardening gloves). Multi-use gloves should be cleaned and stored per the manufacturer's instructions and any workplace policy.
- Workers must be trained on how to put on, use, remove, and if applicable clean, store and dispose of gloves.
- When used incorrectly gloves can lead to the spread of biological hazards. For example, biological hazards can be transferred from one surface or object to another via contaminated gloves.
- Appropriate facilities must be provided to support the use of gloves. This includes hand washing stations with adequate soap, water, paper towels or hand sanitiser to use after gloves are removed, and a closed bin for glove disposal.

Masks – for example, cloth masks, utility masks and surgical masks

- Wearing masks helps prevent biological hazards from having contact with the mouth or nose. They may be appropriate to use where you have identified that workers may be exposed to biological hazards this way.
- Requiring workers to wear masks might also be a reasonably practicable control measure for people at higher risk (e.g. vulnerable people) and for people who work in higher risk settings (e.g. workers who have close contact with sick people or animals).
- Wearing masks can also help prevent infectious people spreading disease to others, but to be effective they must cover the mouth and nose with a good seal.
- Different masks provide varying levels of protection, and some may not be suitable to manage the risks of biological hazards. For example, masks used by workers who are at risk of splash by body substances must have the appropriate level of impermeability (not allowing liquid through) to protect the wearer. Similarly, certain types of masks will not provide sufficient protection from aerosolised biological hazards.
- Cloth and utility masks are not medical grade masks and provide the wearer with the least protection from biological hazards transmitted through the air. However, they may still help limit the spread of some biological hazards in conjunction with higher order controls.
- Surgical masks are medical grade masks which must comply with the relevant national standards (or equivalent). They are required when there is a high risk of exposure to body substances or contaminated air, such as in the healthcare, aged care and disability sectors.

Respiratory protective equipment – for example P2/N95 respirators and powered air-purifying respirators

- Respiratory protective equipment (RPE) is equipment designed to prevent a person wearing the equipment from inhaling airborne contaminants.
- Respirators provide a higher level of protection than standard surgical, cloth and utility masks.
- Medical grade P2/N95 respirators should be used where there is a high risk of exposure to bodily fluids, respiratory particles and aerosols.
- When choosing a respirator, you should consider if the level of protection given is suitable for the level of air contamination, and ensure the filter is suitable for the type of airborne contaminants in the workplace. For example, the filter in a respirator designed to minimise the inhalation of dust may not be sufficient to filter viruses which are transmitted through the air.
- The RPE you use may depend on a range of factors, including
    - the nature of the work, such as the physical demands of the task and the length of time RPE is required to be worn
    - the environment and climatic conditions
    - other hazards which arise from the work task which you may also need to risk manage (e.g. hazardous chemicals), and
    - any medical and physical conditions affecting a worker's fitness to wear RPE.
- If RPE is used, a respiratory protection training program should be developed to provide workers and others training and instruction on the proper use of RPE to ensure it is worn, stored, maintained and disposed appropriately. It should also detail when fit testing and fit checking of tight fitting RPE should be conducted and by whom:
    - **Fit testing** is a test to determine the correct size and style of RPE for the person who will be wearing it. Fit testing should be conducted when RPE is first provided, then at least once a year following the initial test. Fit testing should also occur if there is a change to facial features that may affect how the RPE may fit on the face (e.g. if the wearer loses or gains weight). Fit testing also needs to be conducted again if different RPE is supplied. Fit testing should comply with any relevant Australian standards, such as AS/NZS1715:2009.
    - **Fit checking** is a check you should do every time RPE is worn to ensure it has been properly positioned on the face, and there is a good seal between the RPE and the face. Fit checking should comply with any relevant Australian standards, such as AS/NZS1715:2009.
- Any RPE which needs a tight face seal must not be worn when a good seal cannot be achieved (e.g. a worker has facial hair) as the level of respiratory protection will be compromised.
- Where appropriate, other respirator types should be used if a good seal cannot be achieved with a P2/N95. For example, a powered air purifying respirator (PAPR).

Protective clothing – for example, gowns, aprons, overalls, long sleeve shirts and boots

- Protective clothing should be worn where the skin or clothing may become contaminated with biological hazards.
- The appropriate protective clothing to manage risks will depend on the workplace and the work tasks being performed. Different protective clothing provides varying levels of protection, and you must consider which type will provide adequate protection from the biological hazard and the specific task.
- For example, you may consider the use of waterproof aprons where there is a risk of contact with body substances, gaiters to minimise insect and snake bites when walking through long grass, or waders or gumboots to protect against direct contact with contaminated water.
- Protective clothing must be cleaned and/or disinfected, or disposed of if single use, after being used. You may need to consider using a commercial laundry service to manage the risks of others being exposed to the biological hazard off-site (e.g. other members of a worker's household).

Facial protection – for example, safety eyewear and face shields

- Facial protection should be worn when the face, eyes, nose or mouth may become contaminated with biological hazards.
- Facial protection can act as a physical barrier from splashes or sprays of body substances. It may also prevent people from spreading biological hazards from their hands to their face and eyes.
- Eye protection may be necessary for workers who have a higher risk of exposure to splashes or sprays from body substances (e.g. dentists, police and security).
- Goggles and safety glasses must be closely fitted with a wraparound style.
- Regular prescription glasses will not provide adequate protection and should not act as a replacement for safety eyewear.
- Face shields can be single use or reusable and are generally recommended for use in healthcare or aged care settings where additional protection against splashes or sprays of body substances or some types of contaminated air is required.

APPENDIX H – Examples of occupations at higher risk

Table 4 provides examples of occupations that may have higher risk of exposure to different biological hazard sources. It is not an exhaustive list and PCBUs must still meet their duties with regard to risk management regardless of their worker's occupation.

Table 4: Examples of occupations at higher risk of exposure to biological hazard sources

Biological hazard source	Examples of workers at risk
Intentional contact with microorganisms	• Microbiological laboratory workers* • Pathologist • Research laboratory workers*
Contact with persons or human blood and body substances	• Airline industry workers • Armed forces personnel* • Carers* • Child counselling services workers* • Customer service and hospitality workers • Early childhood education and care workers* • Environmental health officers • First aid personnel* • Funeral workers and embalmers* • Health care workers* • Laundry workers • National border operational roles • Outside school hours carers* • Plumbers, sewage and wastewater treatment workers* • Police and emergency services* • Researchers* • Residential care workers* • School teachers* • Security guards • Sex workers* • Staff of correctional services and immigration and detention centres* • Waste management workers • Workers in personal appearance services (e.g. hairdressers, beauticians etc.) • Workers living in shared work accommodation • Workers who perform skin penetration procedures (e.g. tattooists, body piercers)* • Youth services workers*
Contact with animals and animal blood, body substances, products, hides, skins, wool or hair	• Abattoir workers and meat inspectors* • Agricultural workers* • Animal and bird handlers* • Animal breeders or workers handling animal products of conception* • Animal hunters and trappers*

	• Animal refuge workers (including in animal shelters and boarding facilities)* • Bat handlers and scientists* • Butchers • Cleaners • Culling or processing of wild game* • Customs and border patrol officers • Environmental health officers • Fauna surveyors • Fishing industry and aquaculture workers • Food manufacturers • Forestry workers • Healthcare workers, aged care workers and disability carers • Horticulture industry • Livestock farmers and livestock saleyard workers* • Livestock transporters* • Meat inspectors • National border operational roles • Pet food manufacturing workers* • Pet handlers • Pet store workers • Postal and delivery workers • Poultry workers and poultry handlers* • Primary produce workers* • Sheep shearers* • Swine industry workers* • Tanning and hide workers* • Taxidermists • Veterinarians, veterinary nurses and veterinary students* • Wildlife scientists, wildlife officers and wildlife carers* • Zoo workers*
Contact with human or animal waste	• Cleaners* • Clinical waste workers* • Environmental health officers • Health care workers • National border operational roles • Plumbers* • Poultry workers and poultry handlers* • Primary produce workers* • Recycling waste management workers* • Refuse workers* • Residential care workers • Restoration and remediation workers • Sheep shearers* • Swine industry workers* • Tanning and hide workers* • Veterinarians, veterinary nurses and veterinary students* • Wildlife scientists, wildlife officers and wildlife carers* • Zoo workers*

Contact with contaminated sharps	• Cleaners* • Environmental health officers • Health care workers* • Horticulture and gardening • Hospitality and accommodation industry workers • Laboratory workers* • National border operational roles • Personal appearance services • Police and emergency services • Residential care workers • Utility maintenance workers • Veterinarians* • Waste management workers* • Water treatment plant workers*
Contact with contaminated material, including environments, soil, equipment, surfaces and substances	• Adventure tourism workers • Agricultural workers* • Cleaners* • Construction and demolition workers • Drainage and sewerage workers • Disaster relief workers • Environmental health officers • Environmental scientists • Excavators • Food manufacturers • Forestry workers • Geologists • Horticulture and gardening • Landscape architects • Mining industry • National border operational roles • Occupational hygienists • Plant maintenance workers • Plumbers • Primary produce workers • Restoration and remediation workers • Surveyors • Users of recycled water • Ventilation engineers • Wildlife and parks workers*
Contact with vectors	• Adventure tourism workers • Agricultural workers* • Construction workers • Defence and military workers • Disaster relief workers • Environmental health officers • Field researchers • Forestry workers • National border operational roles

	• Natural resource managers • Workers who travel overseas for work[#] • Pest control workers • Police and emergency services • Utility maintenance workers • Wildlife and parks workers* • Workers that undertake surveillance, control or management of vectors

(*) The Australian Immunisation Handbook contains specific recommendations for these occupations. You should refer to the Australian Immunisation Handbook for up-to-date information.
(#) Information on recommended vaccinations for people working or travelling overseas can also be found in the Australian Immunisation Handbook.

APPENDIX I – Control measures for different exposure types

Given the nature of biological hazards, eliminating the risk of exposure may not be possible for many workplaces. If eliminating the risk of exposure to biological hazards is not reasonably practicable, you must minimise the risk by implementing control measures.

Possible control measures can be grouped according to how workers are exposed to the sources of biological hazards (see **Chapter 1** for further information), including:

- **Direct contact** – these control measures minimise the risk of exposure to biological hazards through direct contact, such as through person-to-person contact, animal to person contact, plant to person contact or contact with human and animal biological material
- **Penetrating injury** – these control measures minimise the risk of exposure to biological hazards through penetrating injuries, such as wounds, sharps injuries, bites and scratches
- **Transmission through the air** – these control measures minimise the risk of exposure to biological hazards transmitted through the air, including exposure to contaminated dust, water or air, organic dust, respiratory particles and splashes or sprays of body substances
- **Vector transmission** – these control measures minimise the risk of exposure to biological hazards through vector transmission, including from mosquitoes, ticks, fleas or mites
- **Contact with contaminated materials** – these control measures minimise the risk of exposure to biological hazards through contact with contaminated materials, including surfaces, objects, soil, waste, water and food.

Workers may be exposed to different biological hazards in the same way, and the control measures you implement to minimise the risk of a worker being exposed to one biological hazard may also help you to minimise the risk of exposure to another. For example, military personnel may be at risk of exposure to viruses and bacteria from the different vectors they come into contact with when working outdoors (e.g. mosquitoes and ticks). While the biological hazards are different, the control measures implemented to protect the military personnel from one vector (e.g. wearing protective clothing and repellent to manage the risk of mosquitoes) could protect them from another vector (e.g. ticks).

Below are examples of control measures grouped according to how people are exposed to biological hazards. The examples are not exhaustive but may assist you to identify appropriate control measures to minimise the risks arising from biological hazards in your workplace.

Direct contact

Direct contact includes physical contact with a person infected with a communicable disease, physical contact with animals infected with zoonotic diseases, physical contact with plant materials which are known to trigger an immune response and contact with human and animal bodily materials (e.g. blood, faeces, urine, saliva, mucus, semen, carcasses and tissues).

Direct contact control measures may include:

- isolating or grouping (cohorting) the source/s of the biological hazard/s (e.g. isolating animals who have a suspected or confirmed case of an infectious disease)
- ensuring workers and others increase hand cleaning using soap and water and/or hand sanitiser
- providing education and signage on control measures which seek to minimise direct contact transmission
- vaccination of people and animals, where applicable, and
- providing suitable PPE, such as protective clothing, safety eyewear, face shields, respiratory protective equipment and gloves.

Penetrating injury

Penetrating injuries can lead to localised and systemic infection.

Measures to prevent and/or manage these injuries include:

- ensuring clothing and footwear is worn that prevents penetrating injuries from the environment (e.g. sticks, thorns and sharp stones) and people and animals (e.g. protecting workers from scratches and bites)
- providing training in animal handling to prevent injuries (e.g. bites, scratches, kicks and horn wounds)
- using equipment to prevent direct handling of animals (e.g. using equipment to move or restrain animals)
- developing first aid and follow-up management plans for high-risk injuries (e.g. bat scratches or bites)
- using equipment which reduces risk of puncture wounds, such as sharps safety disposal containers or safety-engineered devices which prevent sharps injuries (e.g. containers with in-bult needle removal devices)
- implementing safe systems of work practices for the handling, use, disposal and storage of sharps
- providing workers and others in the workplace with training and instruction on:
    - how to appropriately manage the risk of penetrating injuries. For example, how to use and dispose of sharps safely and safe animal handling, and
    - appropriate first aid and follow-up treatment for penetrating injuries. For example, ensuring hairdresser's appropriately treat penetrating injuries caused by hair scissors to avoid infection by immediately washing and covering wounds, and ensuring they know how to monitor for signs of infection and when to seek medical attention.

Transmission through the air

These control measures aim to prevent a person having contact with airborne biological hazards, and may include:

- using ventilation systems and/or air cleaning filters or devices, such as general ventilation to dilute air, or local exhaust ventilation or high efficiency air filter (HEPA) filtration to keep air circulating though the workplace and reduce the concentration of biological hazards in the air
- designing work activities to minimise the generation of dusts (e.g. cotton, grain and wood dust) and aerosols (e.g. body substances aerosolised during medical procedures or organic dust aerosolised during cleaning). For example, installing dust suppression systems (e.g. water sprinklers), wetting materials before cleaning, and avoiding cleaning methods such as the use of high-pressure water systems or dry sweeping
- inspecting, maintaining/cleaning and testing/sampling water, surfaces and air handling systems in buildings to prevent and identify the growth of microorganisms, such as bacteria and fungi
- implementing use of suitable PPE, such as correctly fitted RPE or PPE to protect workers' eyes, nose and mouth from contact with respiratory particles (see **Appendix G** for further information on PPE)
- putting in place a barrier to ensure people maintain a safe distance from the source of the biological hazard and do not come into contact with respiratory particles
- installing physical barriers to contain respiratory particles (e.g. splash guards or screens)
- using biosafety cabinets and air locks to contain the biological hazard
- vaccination of people and animals where applicable, and
- informing and providing workers with resources on respiratory hygiene and cough etiquette, such as covering coughs and sneezes and good hand hygiene.

Vector transmission

Vector-borne control measures aim to prevent vectors (e.g. mosquitoes, fleas and ticks) spreading a biological hazard to a person, and may include:

- removing potential sources of a biological hazard. For example, stagnant bodies of water mosquitoes can breed in
- acting on any reports of pest infestations in the workplace, including preventing access to the affected area as soon as practical and taking necessary steps to remove pests
- minimising exposed skin by wearing protective clothing, such as long sleeve shirts, trousers, enclosed shoes and hats with head net to protect the face when working outside
- where possible, limiting work outdoors when vectors are most active (e.g. at dawn and dusk, when the weather is very humid or when there has been heavy rainfall/flooding)
- monitoring the weather and environment, where possible, and adjusting work activities when vector populations in an area are expected to increase
- ensuring work areas and workplace accommodation have appropriate insect screening and/or other insect prevention (e.g. mozzie-zapper)

- vaccination where applicable
- applying insect repellent on exposed skin, and
- providing basic training to workers on how vector-borne disease spreads, the risks of exposure and infection, and how they can protect themselves from vectors.

Contact with contaminated materials

Contact with contaminated surfaces, objects, soil and waste

Exposure to biological hazards can occur from people coming into contact with contaminated surfaces, objects, soil and waste. Control measures to reduce contact with these contaminated materials include:

- promoting good hygiene
- cleaning, disinfecting and sterilising areas and equipment that may come into contact with biological hazards
- ensuring handling of equipment minimises risk of contact transmission. For example, using dedicated re-usable equipment or single use of equipment to minimise cross contamination
- limiting access to high-risk areas where biological hazards or sources may be present. For example, limiting access to contaminated samples in a laboratory setting to those who are trained to appropriately handle these materials
- ensuring appropriate handling of waste products
- vaccination where applicable, and
- providing suitable PPE, such as protective clothing, safety eyewear, RPE, masks and gloves.

Contact with contaminated food

Food-borne control measures aim to prevent contact or consumption of food contaminated with a biological hazard (e.g. norovirus or salmonella), and may include:

- separating food preparation and eating areas from workspaces
- following proper food safety preparation and storage procedures
- ensuring good hand hygiene, including washing hands before eating and drinking
- providing workers and others with training and instruction on how to appropriately manage the risks of food-borne diseases. For example, ensuring workers with symptoms of gastroenteritis do not prepare or serve food to others, and
- providing suitable PPE, such as protective clothing (e.g. aprons and gloves).

Contact with contaminated water

Water-borne control measures aim to prevent contact with or consumption of water containing bacteria, viruses or parasites that are transmissible to humans, and may include:

- water filtration and decontamination systems to remove any potential biological hazards
- testing water for the presence of biological hazards
- ensuring drinking water supplied is clean and safe to drink
- providing workers and others in the workplace with training and instruction on how to appropriately manage the risks of water-borne diseases, and
- providing suitable PPE to protect potential entry points for biological hazards, such as the eyes, nose and mouth, where there is a risk of contact with contaminated water.

Post exposure procedures

Regardless of the controls you put in place to manage the risk of workers being exposed to biological hazards in your workplace, you should develop and inform workers of post exposure procedures. These should outline what to do if a worker is exposed to a biological hazard at the workplace outside of ordinary business hours, or if the exposure occurs outside of the usual workplace. This should include:

- first aid procedures
- having fully stocked and accessible first aid kits and ensuring workers are appropriately trained on how to use equipment.
- who to contact for help and support if required (e.g. national helpline)
- medical referral procedures (e.g. on call GP services and emergency clinics) and access to counselling (e.g. Employee Assistance Programs), if necessary
- the main contacts to be notified if an incident occurs, and
- responsibilities for incident reporting and investigation.

Regular training on these procedures will ensure a rapid and appropriate response should an exposure occur.

APPENDIX J – Links to key resources

WHS Regulators

- New South Wales: SafeWork NSW
- Victoria: WorkSafe Victoria
- Queensland: WorkSafe QLD
- South Australia: SafeWork SA
- Western Australia: WorkSafe WA
- Tasmania: WorkSafe Tasmania
- Northern Territory: NT WorkSafe
- Australian Capital Territory: WorkSafe ACT
- Commonwealth: Comcare

Other Safety Regulators

- Office of the Gene Technology Regulator
- Therapeutic Goods Administration
- Australian Pesticides and Veterinary Medicines Authority

Other Commonwealth Government Agencies and Authorities

- Australian Government Department of Health, Disability and Aged Care
- Australian Centre for Disease Control
- Australian Government Department of Agriculture, Fisheries and Forestry (DAFF)
    - DAFF Biosecurity
- CSIRO – Australian Centre for Disease Preparedness
- Australian Government Department of Climate Change, Energy, the Environment and Water
- National Health and Medical Research Council
- Australian Commission on Safety and Quality in Health Care

Australian Human Rights Commission

The Australian Human Rights Commission is an independent third party which investigates complaints about discrimination and human rights breaches. Phone: 1300 369 711. Website: https://humanrights.gov.au/

Fair Work Commission

The Fair Work Commission is Australia's national workplace relations tribunal and registered organisations regulator. Phone: 1300 799 675. Website: fwc.gov.au

Fair Work Ombudsman

The Fair Work Ombudsman is Australia's national workplace relations regulator. It has the function of promoting harmonious, productive, cooperative and compliant workplace relations. It monitors, inquires into, investigates and enforces compliance with Australia's workplace laws. It also provides free information and advice on pay, conditions and workplace rights and obligations. Phone: 13 13 94. Website: fairwork.gov.au

Office of the Australian Information Commissioner

The Office of the Australian Information Commissioner is an independent national regulator for privacy and freedom of information. It promotes and upholds people's right to have their personal information protected. Phone: 1300 363 992. Website: https://www.oaic.gov.au/

Workers' compensation

If a worker sustains an injury or illness from exposure to a biological hazard at work requiring medical attention or time off work, they may be able to access worker's compensation.

- New South Wales: NSW State Insurance Regulatory Authority
- Victoria: WorkSafe Victoria
- Queensland: WorkCover Queensland
- South Australia: ReturnToWork SA
- Western Australia: WorkCover WA
- Tasmania: WorkSafe Tasmania
- Northern Territory: NT WorkSafe
- Australian Capital Territory: WorkSafe ACT
- Commonwealth: Comcare