

GOING

DISEASE IN MELBOURNE'S PAST, PRESENT AND FUTURE

VIRAL



CITY OF MELBOURNE

18 February –
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City Gallery
Melbourne Town Hall

[melbourne.vic.gov.au/
citygallery](http://melbourne.vic.gov.au/citygallery)

Going Viral

**Disease in Melbourne's past,
present and future.**

From the dreaded black plague to flu epidemics of the 21st century, Melbourne continues to encounter the spread of disease across the globe.

Whether arrived by 19th century sailing clipper or a contemporary A380 aircraft, diseases that visit Melbourne always cause fear and can impact with devastating consequences. This illuminating exhibition offers a focused guide to our city and its never ending fight with disease.

Humans have always shared the biosphere with myriad diseases.

In places where people live, travel and congregate in numbers, disease is a part of human experience.

Diseases have visited Melbourne for many generations, and this exhibition invites you to consider some that have impacted the city, touched its people and shaped its response.

From smallpox to the dreaded black plague and flu epidemics of the 21st century, deadly diseases have followed the spread and growth of human populations across the globe. In the 19th century diseases travelled across the sea; today they also arrive by aeroplane. Like visitors, diseases come and go, though some stay and live among us.

The science of bacteriology and improvements to urban sanitation and public health have virtually eradicated the biggest killers, including tuberculosis, typhoid and childhood diseases. But with booming global population growth and around 70 per cent of people expected to live in cities by 2050, protection from mass infections cannot be taken for granted.

At different times in Melbourne's history, the threat of disease has driven ways to better protect and treat the people living here. Today, the rise in chronic diseases such as obesity presents another challenge to health into the future.

Can Melbourne's 'diseased past' be a guide to the city's future? In touching on the ways disease visits the city, the images and anecdotes of this exhibition appear like beacons, illuminating the way for future generations to consider how they can live with disease. After all, disease is always with us.

This 'form guide' to diseases will introduce just some of the infectious characters that have visited the city – and some that have stayed. Like the myriad bacteria on the surface of this page, there are simply too many diseases on the planet to cover in one exhibition or catalogue. Among other diseases, this exhibition gives you a dose of black plague, some typhoid and cholera, and a bit of diarrhoea to contemplate.

So if you're feeling up to it, read on!

SOME DEFINITIONS

Endemic

Diseases found among a particular people or in a certain area

Epidemic

An outbreak or unusually high occurrence of disease or illness in a population or area

Miasma theory

Until the late 19th century, it was believed diseases were caused by the presence in the air of a miasma (a poisonous vapour), in which was suspended particles of decaying matter characterised by the foul smell. Miasma theory was set aside with the discovery of bacteria and viruses.

Bruce Copland

CURATOR

SIGNS & SYMPTOMS	Flu-like symptoms include sudden onset fever, chills, head and body aches and weakness, vomiting and nausea. Bubonic plague – the most common of the three forms – infects a lymph node, which becomes inflamed, tense and painful (and called a 'bubo'); advanced cases may turn into open sores.
ORIGINS	The disease is thought to have originated on the arid plains of Central Asia, travelling along the Silk Road and reaching Crimea by 1343. It was most likely carried by Oriental rat fleas living on black rats.
TRACK RECORD	There have been three major pandemics, beginning in the 6th century. The disease peaked in Europe during 1346–53, killing an estimated 75 million to 200 million people, about a quarter of the world's population. In 2013, there were 783 reported cases worldwide for this extremely contagious disease, including 126 deaths.
RISK FACTORS	Contact with an infected flea.
PREVENTION & TREATMENT	The two vaccines available are only moderately effective but can reduce mortality during epidemics. Fumigation is effective in destroying rodents on ships, and traps and poisons can control urban outbreaks. DDT dusting powder can eradicate fleas in rat burrows. If given before septicaemia and shock have developed, antibiotics with supportive care are effective in treating the disease.

SIGNS & SYMPTOMS	High fever and fatigue, followed by a characteristic rash on the face, arms and legs; spots turn into pustules and scabs, which leave permanent scars.
ORIGINS	Smallpox has existed for at least 3000 years.
TRACK RECORD	Fatal in up to 30 percent of cases, smallpox once killed two million people each year, though large outbreaks were uncommon. As recently as the 1960s, around 12 million people were infected; the last known natural case was detected in Somalia in 1979. One of the world's most feared diseases, smallpox was eradicated by a World Health Organisation–led global vaccination program.
RISK FACTORS	Stocks of the smallpox virus are kept in two secure laboratories: in the United States and in the Russian Federation. Some governments believe the virus exists in other places and could pose a future bio-security risk for the world.
PREVENTION & TREATMENT	There is no cure for smallpox, although an effective vaccination exists. Given within four days of contracting the disease, it has helped eradicate smallpox in the past. The effectiveness of new antiviral drugs is unknown.

SIGNS & SYMPTOMS	Sore throat, fever and a sandpaper-like rash on reddened skin over most of the body; a 'strawberry' tongue (inflamed bumps on the surface with a red colouring) also present in children.
ORIGINS	It is unclear when the disease was first accurately recorded, although medical descriptions of scarlet fever emerged in the 16th century.
TRACK RECORD	This highly contagious disease mainly affects children aged two to 10, and is spread by sneezing, coughing or direct contact. While common in the early 20th century, scarlet fever is rare today. Mortality rates are less than one percent globally. Antibiotics have reduced its prevalence, possibly also due to the strain of bacteria becoming weaker.
RISK FACTORS	Contact with an infected person.
PREVENTION & TREATMENT	There is no vaccine available, but by 10 years of age 80 percent of children naturally acquired protective antibodies. Scarlet fever will often clear up spontaneously within a few days. Antibiotics (penicillin) are used for more severe cases, as for any <i>Streptococcus</i> throat infection.

SIGNS & SYMPTOMS	Can present in four stages: firm, painless, non-itchy skin sores and ulcerations (primary); diffuse rash on palms of hands and soles of the feet, which can include the entire body (secondary); little or no symptoms (latent); soft, non-cancerous growths, neurological or cardiac symptoms (tertiary).
ORIGINS	The exact origin of syphilis is unknown, but it is thought that it was carried from the New World to Europe after Christopher Columbus's voyage to the Americas.
TRACK RECORD	Since 1999, around 12 million people have been infected, mostly in developing countries. The disease decreased dramatically following the widespread availability of penicillin in the 1940s, though rates of infection have increased since 2000 in many countries, often in combination with HIV. Syphilis is transmitted through close skin-to-skin contact and is highly contagious when the syphilis sore or rash is present. Most infections are a consequence of unsafe sex or blood transfusion (acquired), or from mother to child in utero (congenital). In 2015, Cuba became the first and only country to eradicate syphilis. Since 2002, the number of people with infectious syphilis in Victoria has increased rapidly, mainly among gay men and men who have sex with men.
RISK FACTORS	Engaging in unsafe sex with an infected person can increase the likelihood of becoming infected. Syphilis can also be transmitted from mother to baby during pregnancy, but congenital syphilis is rare in Australia.
PREVENTION & TREATMENT	Safe sex is the best form of prevention. Penicillin is a very effective treatment for all stages of syphilis, including congenital syphilis.

SIGNS & SYMPTOMS	Acute diarrhoeal disease that can kill within hours if left untreated; about 80 percent of carriers are without symptoms.
ORIGINS	Cholera spread during the 19th century from the Ganges Delta in India.
TRACK RECORD	Following the disease's emergence in India, six subsequent pandemics killed millions across all continents. A current (seventh) pandemic spread from South Asia in 1961, reaching the Americas in 1961. This extremely virulent disease can affect children and adults within hours. An estimated 28,000–142,000 deaths occur worldwide from cholera each year. Endemic in many countries, the disease remains a global threat to public health and indicates a lack of social development.
RISK FACTORS	Transmission is linked to inadequate environmental management. 'At risk' areas include urban slums lacking basic infrastructure, and camps for people who are displaced or refugees.
PREVENTION & TREATMENT	Safe water and sanitation is critical. Oral rehydration salts can treat up to 80 percent of cases. Oral vaccines are an additional control measure.

SIGNS & SYMPTOMS	Defined by three or more loose or liquid stools per day (or more frequent than normal); usually a symptom of an infection in the intestinal tract, with early symptoms including thirst, vomiting, decreased skin elasticity and sunken eyes, progressing to shock, diminished consciousness, low blood pressure, pale skin and death.
ORIGINS	Throughout history, infectious diarrhoea has been associated with crowding, poor sanitation and war.
TRACK RECORD	Diarrhoeal disease is a leading cause of child mortality and morbidity. Each year it kills around 760,000 children less than five years of age. Globally there are 1.7 billion cases every year. It is easy to catch wherever the disease is present (e.g. in the water supply) and there is poor sanitation and a lack of personal hygiene. Widespread in developing countries, diarrhoeal disease persists in developed countries where urban environmental health and food-safety practices are not maintained.
RISK FACTORS	The most severe threat posed by diarrhoea is dehydration, as fluid and electrolytes (salts) are lost and not replaced.
PREVENTION & TREATMENT	Most diarrhoeal diseases can be prevented through safe drinking water and adequate sanitation and hygiene. Treatment includes an oral rehydration salts solution or an intravenous drip.

SIGNS & SYMPTOMS	Before settlement in Victoria, whalers and sealers had introduced sexually transmitted diseases. Most serious for Aboriginal women and their fertility were gonorrhoea and chlamydia, but syphilis wasn't far behind. Melbourne's founder, John Batman, died in 1839 of an advanced (tertiary) case of syphilis. A colonial port city, Melbourne was a gateway for the disease arriving with ship-borne passengers.
ORIGINS	When arsenic-based drugs were successfully trialed in treating infected servicemen overseas, confidence grew in the medical control of syphilis. Victoria's first venereal disease clinic opened 17 June 1918 at 440 Lonsdale Street. Fear and moral rectitude were arguably among the reasons the Venereal Diseases Act 1917 required warning notices to be issued to infected people, advising them to complete treatment and even to avoid marriage. During the 20th century, local health authorities and councils complemented state government measures to educate and treat the population. Until the 1990s, the Melbourne Sexual Health Clinic, originally established as Victoria's Venereal Diseases Clinic, remained the only government-funded standalone, rather than hospital-associated, major clinic of this nature in Australia. The advent of HIV/AIDS caused the work of the government clinic to expand, and in 1992 the facility was relocated to 580 Swanston Street and named the Melbourne Sexual Health Centre.
TRACK RECORD	Cholera never reached Melbourne due largely to the vast distance to Port Phillip, plus effective quarantine practices at Queens Wharf and Point Nepean. British quarantine laws formed the basis for the local practices that protected Melbourne's population from many incoming diseases, including cholera, smallpox and the plague.
RISK FACTORS	Cholera was one of several feared waterborne diseases that motivated the colonial government and city administrators to work towards creating a clean water supply for Melbourne from the Yan Yean Reservoir. Building proper urban drainage and sewerage infrastructure were other important public health reforms undertaken during the 19th and 20th centuries, greatly improving urban sanitation and reducing death rates. Like cholera, Ebola is a global disease that should never arrive in Melbourne due to high-quality frontline health facilities. The Victorian Infectious Diseases Reference Laboratory in Carlton forms part of the international network responsible for early detection and emergency response to worldwide epidemics.
PREVENTION & TREATMENT	Cholera is the feared visitor who never arrived. In 1849, Melburnians heard about deadly cholera outbreaks in Europe, such as the 62,000 deaths in Britain, in 1848–49, attributed to cholera. Fear of the disease arriving was high in the public's mind.

SIGNS & SYMPTOMS	Sudden onset of high fever, a cough, headache, muscle and joint pain, runny nose, sore throat and feeling unwell.
ORIGINS	The human disease is thought to have arisen about 6000 years ago.
TRACK RECORD	Seasonal influenza (type A) is most contagious for humans. When an infected individual coughs, another person can breathe in the infected droplets; contaminated hands can also spread the virus. Worldwide, annual epidemics result in an estimated three–five million cases of severe illness and 250,000–500,000 deaths. Influenza viruses circulate in all parts of the world, and new viruses constantly emerge from the environment, including from sources such as migratory waterbirds, swine, domestic poultry and sea animals.
RISK FACTORS	Influenza can cause severe illness or death for people at high risk, including children younger than two years, adults aged 65 years or older, pregnant women and people with an existing medical condition. Type A influenza is most associated with epidemics, due in part to being capable of rapidly evolving and thereby avoiding immune responses.
PREVENTION & TREATMENT	Vaccines are available for the more common influenza (type A). Most people recover from fever and other symptoms within a week, without requiring medical attention. Covering the mouth and nose when coughing helps to prevent transmission, together with regular hand washing.

SIGNS & SYMPTOMS	Acute diarrhoeal disease that can kill within hours if left untreated; about 80 percent of carriers are without symptoms.
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RISK FACTORS	The most severe threat posed by diarrhoea is dehydration, as fluid and electrolytes (salts) are lost and not replaced.
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SIGNS & SYMPTOMS	Multiple bacteria (e.g. salmonella) viruses (e.g. gastro-enteritis) and parasitic organisms (e.g. giardia)
ORIGINS	The early years were critical for these diseases, when population growth simply overwhelmed the inadequate city infrastructure. For example, between 1852 and 1854, in the early years of the gold rush, a vast campground sprung up on the southern side of the Yarra River, accommodating up to 7000 immigrants. While 'Canvas Town' offered a bed, food, restaurants and basic facilities, the squalid conditions for people living in close proximity provided the perfect ecological conditions for gastro-enteritis and dysentery to take hold. Typhoid and diphtheria were also close at hand.
TRACK RECORD	Today, increasing population and crowded urban living conditions continue to place stress on Melbourne's environmental health and food-safety practices. Despite Melbourne enjoying its 'Most Liveable' status, visitors dining out in the city can still experience gastro-enteritis from food poisoning.
RISK FACTORS	Poor food-handling practices, including lack of hygiene by food preparers, increase the risk.
PREVENTION & TREATMENT	Safe food handling and production practices and good hygiene in food handlers will prevent the spread of salmonella. Recovery in relatively mild cases will not require specific treatment, but dehydration can become life threatening. Electrolyte replacement and rehydration are needed for severe cases.

SIGNS & SYMPTOMS	High fever, flu-like symptoms, abdominal pain, constipation or diarrhoea, and rose-coloured spots on the chest.
ORIGINS	The disease is thought to have originated on the arid plains of Central Asia, travelling along the Silk Road and reaching Crimea by 1343. It was most likely carried by Oriental rat fleas living on black rats.
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RISK FACTORS	Poor-quality water supply, lack of sanitation and poor hygiene are all risk factors. Healthy carriers should not handle food. Somewhat infamously, 'Typhoid Mary' (Mary Mallon), a cook in New York City in the early 20th century, was the first carrier identified – and responsible for 53 infections and three deaths.
PREVENTION & TREATMENT	The two vaccines available are only moderately effective but can reduce mortality during epidemics. Fumigation is effective in destroying rodents on ships, and traps and poisons can control urban outbreaks. DDT dusting powder can eradicate fleas in rat burrows. If given before septicaemia and shock have developed, antibiotics with supportive care are effective in treating the disease.

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RISK FACTORS	Contact with an infected person.
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Black Plague

BACTERIA (Yersinia pestis)

Melbourne was relatively unaffected by the black plague, with only 10 cases recorded in 1900. The disease reached Sydney in January 1900, leading to an immediate clean up of slum housing in the Rocks area and rat extermination programs across Australia. Small outbreaks continued until 1925.

The national response to the plague was muted, but local government raised awareness about specific public health practices, including boiling water and milk, and reducing rodent numbers in populated areas. The ability of native rodents to act as reservoirs for the disease is not known, but our large cities support sizeable populations of black rats, which certainly can. The planet's warming climate is favourable to rats' breeding, and the prospect of another pandemic cannot be discounted. The movement of people and goods around the world also provides unprecedented opportunities for an outbreak.

Smallpox

VIRUS (Variola)

Smallpox is one of many imported infectious diseases that impacted Melbourne's early European settlers, with new arrivals providing fresh opportunities for this Old World disease to flourish in its new environment.

While the first known smallpox epidemic in Australia broke out in Sydney in 1789, the disease had already made its way into Aboriginal Australia through fishermen living in the Indonesian archipelago. The disease then moved through the sparsely populated interior, following Aboriginal trade and communication lines. Smallpox immediately preceded European settlement of Victoria, depopulating the densest Aboriginal communities along the Murray and through the Western District. With no immunity to imported diseases, Aboriginal people of all ages died from smallpox, tuberculosis, measles, sexually transmitted infections and typhoid, some of which also made women infertile. It is estimated that in Victoria, the Aboriginal population fell from 60,000 in 1788 to around 650 in 1901, with smallpox having already cut the population in half twice before European settlement in 1834. In 1978, the Point Nepean Quarantine Station was closed when the World Health Organisation declared the threat of smallpox had been eradicated.

Syphilis

BACTERIA (Treponema pallidum)

Before settlement in Victoria, whalers and sealers had introduced sexually transmitted diseases. Most serious for Aboriginal women and their fertility were gonorrhoea and chlamydia, but syphilis wasn't far behind. Melbourne's founder, John Batman, died in 1839 of an advanced (tertiary) case of syphilis. A colonial port city, Melbourne was a gateway for the disease arriving with ship-borne passengers.

When arsenic-based drugs were successfully trialed in treating infected servicemen overseas, confidence grew in the medical control of syphilis. Victoria's first venereal disease clinic opened 17 June 1918 at 440 Lonsdale Street. Fear and moral rectitude were arguably among the reasons the Venereal Diseases Act 1917 required warning notices to be issued to infected people, advising them to complete treatment and even to avoid marriage. During the 20th century, local health authorities and councils complemented state government measures to educate and treat the population. Until the 1990s, the Melbourne Sexual Health Clinic, originally established as Victoria's Venereal Diseases Clinic, remained the only government-funded standalone, rather than hospital-associated, major clinic of this nature in Australia. The advent of HIV/AIDS caused the work of the government clinic to expand, and in 1992 the facility was relocated to 580 Swanston Street and named the Melbourne Sexual Health Centre.

Cholera

BACTERIA (Vibrio cholera)

Cholera is the feared visitor who never arrived. In 1849, Melburnians heard about deadly cholera outbreaks in Europe, such as the 62,000 deaths in Britain, in 1848–49, attributed to cholera. Fear of the disease arriving was high in the public's mind.

Cholera never reached Melbourne due largely to the vast distance to Port Phillip, plus effective quarantine practices at Queens Wharf and Point Nepean. British quarantine laws formed the basis for the local practices that protected Melbourne's population from many incoming diseases, including cholera, smallpox and the plague.

Cholera was one of several feared waterborne diseases that motivated the colonial government and city administrators to work towards creating a clean water supply for Melbourne from the Yan Yean Reservoir. Building proper urban drainage and sewerage infrastructure were other important public health reforms undertaken during the 19th and 20th centuries, greatly improving urban sanitation and reducing death rates. Like cholera, Ebola is a global disease that should never arrive in Melbourne due to high-quality frontline health facilities. The Victorian Infectious Diseases Reference Laboratory in Carlton forms part of the international network responsible for early detection and emergency response to worldwide epidemics.

Diarrhoeal Diseases

MULTIPLE BACTERIA (e.g. salmonella)

VIRUSES (e.g. gastro-enteritis)

AND PARASITIC ORGANISMS (e.g. giardia)

Diarrhoeal disease was among the most consistent killers in early Melbourne. Associated infant mortality was high throughout the 19th century, until drainage, waste removal and sewerage were developed. The spread of disease was also helped by the presence of the Australian bush fly.

The early years were critical for these diseases, when population growth simply overwhelmed the inadequate city infrastructure. For example, between 1852 and 1854, in the early years of the gold rush, a vast campground sprung up on the southern side of the Yarra River, accommodating up to 7000 immigrants. While 'Canvas Town' offered a bed, food, restaurants and basic facilities, the squalid conditions for people living in close proximity provided the perfect ecological conditions for gastro-enteritis and dysentery to take hold. Typhoid and diphtheria were also close at hand.

Today, increasing population and crowded urban living conditions continue to place stress on Melbourne's environmental health and food-safety practices. Despite Melbourne enjoying its 'Most Liveable' status, visitors dining out in the city can still experience gastro-enteritis from food poisoning.

Typhoid

BACTERIA (Salmonella typhi)

As an unfortunate historical footnote to this disease, James Blackburn, who designed the successful Yan Yean scheme, which delivered Melbourne's first water supply from outside the polluted Yarra catchment, died of typhoid fever in March 1854.

Typhoid was so much a feature of Victorian life that it was initially known as 'Colonial Fever', before it was properly diagnosed in the 1870s. Typhoid was a regular visitor to early Melbourne, typically arriving with the onset of winter. Against a backdrop of boomtown 'Marvellous Melbourne', typhoid was a 'fifth disease' linked to the city's profoundly polluted state.

By the 1880s and due partly to typhoid, Melbourne's hospitals struggled to cope with infectious diseases, which led to opening Fairfield Infectious Diseases Hospital in 1904. The growing typhoid death toll and the acceptance of germ theory finally motivated the sewerage of Melbourne after 1897. The newly created Melbourne Metropolitan Board of Works, headed by FG Fitzgibbon, oversaw the development of the sewerage scheme.

Scarlet Fever

BACTERIA (Streptococcus)

Victoria's worst epidemic of scarlet fever occurred in 1875–76. Prior outbreaks of measles and diphtheria set the scene for that epidemic. The outbreak of scarlet fever gave further impetus to plans started in 1874 to build Melbourne's first infectious diseases hospital. That hospital started operating in Fairfield in 1904.

The high death rate during the late 19th century was felt by the city's youngest and most vulnerable, and was tied to the crisis in sanitation during the period. The so-called 'childhood diseases' of the era included measles, scarlet fever, diphtheria and whooping cough.

Diphtheria

BACTERIA (Corynebacterium diphtheriae)

Diphtheria was first recorded in Victoria in 1858, and was responsible for a large death toll of 4574 by 1869.

East Collingwood was the worst hit area of inner Melbourne, with 'deadly marsh vapours' initially considered responsible for various throat-related conditions in a time before the science of bacteriology. With infected people living in close proximity, the spread of diphtheria through inner Melbourne was boosted by overcrowded housing and an absence of even basic hygiene practices.

The high deaths during the late 19th century occurred among the city's youngest and most vulnerable, and were tied to the crisis of sanitation during the period. 'Childhood diseases' of the period included diphtheria, measles, scarlet fever and whooping cough.

Measles

VIRUS (Morbillivirus)

Measles first arrived in Australia on the Persian, which docked in Victoria in 1850. The first measles epidemic occurred soon after (1853–54), with the highest death rates, 50–200 per 100,000, occurring in 1874–75, before tapering off after 1900. The city's youngest and most vulnerable citizens were most affected by this so-called 'childhood disease'.

It is unlikely the disease arrived before 1850, owing to high levels of pre-existing immunity in ship passengers, low numbers of travelling children and the journey's length from England to Australia. Only when the voyage time was shortened could passengers still be infectious on arrival, passing on the disease to the general population.

The recent decline in child immunisation rates is causing concern for the City of Melbourne, among other health authorities, which seeks to prevent the return of any childhood diseases.

Influenza

SEASONAL VIRUS (Types A, B, and C, which is less common)

Victoria's first influenza outbreak was in 1860–61, but it did not achieve epidemic proportions until 1885.

The highest influenza death rates recorded are for the 'Spanish flu' pandemic of 1918–19, reaching 240 per 100,000 for Victoria in 1919, the highest for any communicable disease in its history. Nationally, around 12,000 people died; the global death rate of more than 40 million exceeded the number of deaths during World War I.

Melbourne shared in the worldwide panic that accompanied the influenza pandemic. With hospitals unable to cope, temporary hospitals were opened in the Royal Exhibition Building and in local schools across the city. The outbreak of Spanish flu struck Melbourne on 21 January 1919, and by month's end health authorities were providing free inoculations to more than 1000 people a day. Despite never reaching Melbourne, SARS is another flu-like disease that caused panic when it first emerged from China's Guangdong Province in 2003. Swine flu and avian, or 'bird', flu are examples of emerging strains of influenza virus. The first cases of swine flu were reported in Melbourne in May 2009, reviving memories of previous influenza outbreaks. Another influenza pandemic continues to be the leading disease threat to Melbourne, as evidenced by the state government's Victorian health management plan for pandemic influenza.

Salmonella

BACTERIA (Salmonella non typhoidal type)

From high-end CBD restaurants to suburban salami manufacturers, salmonella poisoning is on the increase in Melbourne. Because salmonella thrives wherever there is poor food hygiene, safeguarding people from this avoidable disease begins well before the food is on your plate.

Salmonella is one of the most common and widespread food-borne diseases in the world. Unsurprisingly, it's right at home in Melbourne. Where food is grown, how it is produced and transported, and the way it is stored and prepared are among the food safety questions increasingly occupying the minds of urban managers tasked with protecting Melbourne's population health. Add to the mix the increasing inner-city population and the growing demand for Melbourne's famous food and hospitality services, the food safety challenge is significant both now and for generations to come.

SIGNS & SYMPTOMS	High fever, flu-like symptoms, abdominal pain, constipation or diarrhoea, and rose-coloured spots on the chest.
ORIGINS	The disease is thought to have originated on the arid plains of Central Asia, travelling along the Silk Road and reaching Crimea by 1343. It was most likely carried by Oriental rat fleas living on black rats.
TRACK RECORD	There have been three major pandemics, beginning in the 6th century. The disease peaked in Europe during 1346–53, killing an estimated 75 million to 200 million people, about a quarter of the world's population. In 2013, there were 783 reported cases worldwide for this extremely contagious disease, including 126 deaths.
RISK FACTORS	Poor-quality water supply, lack of sanitation and poor hygiene are all risk factors. Healthy carriers should not handle food. Somewhat infamously, 'Typhoid Mary' (Mary Mallon), a cook in New York City in the early 20th century, was the first carrier identified – and responsible for 53 infections and three deaths.
PREVENTION & TREATMENT	The two vaccines available are only moderately effective but can reduce mortality during epidemics. Fumigation is effective in destroying rodents on ships, and traps and poisons can control urban outbreaks. DDT dusting powder can eradicate fleas in rat burrows. If given before septicaemia and shock have developed, antibiotics with supportive care are effective in treating the disease.

SIGNS & SYMPTOMS	Sore throat, fever and a sandpaper-like rash on reddened skin over most of the body; a 'strawberry' tongue (inflamed bumps on the surface with a red colouring) also present in children.
ORIGINS	It is unclear when the disease was first accurately recorded, although medical descriptions of scarlet fever emerged in the 16th century.
TRACK RECORD	This highly contagious disease mainly affects children aged two to 10, and is spread by sneezing, coughing or direct contact. While common in the early 20th century, scarlet fever is rare today. Mortality rates are less than one percent globally. Antibiotics have reduced its prevalence, possibly also due to the strain of bacteria becoming weaker.
RISK FACTORS	Contact with an infected person.
PREVENTION & TREATMENT	There is no vaccine available, but by 10 years of age 80 percent of children naturally acquired protective antibodies. Scarlet fever will often clear up spontaneously within a few days. Antibiotics (penicillin) are used for more severe cases, as for any <i>Streptococcus</i> throat infection.

SIGNS & SYMPTOMS	Sore throat and swollen neck associated with infection of the upper throat (most common form); most strikingly, a greyish membrane covering the tonsils and upper part of the throat.
ORIGINS	Hippocrates first described the disease in the 5th century. Edwin Klebs, a German-Swiss pathologist, identified the bacteria in 1882.
TRACK RECORD	Spain recorded one of the world's earliest epidemics of diphtheria in 1613, the highly contagious disease spread by droplets from the coughing or sneezing of an infected person or carrier. While once a major childhood killer, diphtheria outbreaks are now rare in developed countries due to widespread immunisation; it most often occurs in Sub-Saharan Africa, India and Indonesia. The disease can be fatal in five to 10 percent of cases, and in 2013 it resulted in 3300 deaths, down from 8000 in 1990.
RISK FACTORS	The disease can be more prevalent in the winter months.
PREVENTION & TREATMENT	Prevention today is mostly due to widespread immunisation programs, though infected carriers should be avoided. Treatment includes a combination of medications and supportive care, and intensive care is necessary if respiratory symptoms occur.

SIGNS & SYMPTOMS	Sore throat followed by a runny nose, cough, red and watery eyes, and, possibly, small white spots inside the cheeks; a rash later appears on face and upper neck, then hands and feet
ORIGINS	Measles strains may have first developed in the 11th and 12th centuries, associated with cattle. The current epidemic strain evolved probably between 1908 and 1943, and only infects humans.
TRACK RECORD	Measles remains one of the leading causes of death among young children globally, despite the availability of a safe and effective vaccine. This highly contagious respiratory disease is spread by coughing and sneezing. In 1980, before widespread vaccination, measles caused an estimated 2.6 million deaths per year. Approximately 147,000 people died from measles in 2013, mostly children under the age of five.
RISK FACTORS	Personal contact with an infected person and direct contact with infected secretions are risks. Unvaccinated children are at the highest risk. Poor nutrition, insufficient vitamin intake and weak immune systems may be complicating factors.
PREVENTION & TREATMENT	Routine measles vaccination is recommended for children, and mass immunisation programs in countries with high case and death rates. People who recover from measles are immune for the rest of their lives. Measles vaccination resulted in a 75 percent drop in measles deaths between 2000 and 2013 – preventing an estimated 15.6 million deaths. Supportive care is a usual treatment. Severe complications can be avoided through good nutrition, adequate fluid intake and treatment for underlying health conditions. Antibiotics may assist with secondary (bacterial) infections.

SIGNS & SYMPTOMS	Sudden onset of high fever, a cough, headache, muscle and joint pain, runny nose, sore throat and feeling unwell.
ORIGINS	The human disease is thought to have arisen about 6000 years ago.
TRACK RECORD	Seasonal influenza (type A) is most contagious for humans. When an infected individual coughs, another person can breathe in the infected droplets; contaminated hands can also spread the virus. Worldwide, annual epidemics result in an estimated three–five million cases of severe illness and 250,000–500,000 deaths. Influenza viruses circulate in all parts of the world, and new viruses constantly emerge from the environment, including from sources such as migratory waterbirds, swine, domestic poultry and sea animals.
RISK FACTORS	Influenza can cause severe illness or death for people at high risk, including children younger than two years, adults aged 65 years or older, pregnant women and people with an existing medical condition. Type A influenza is most associated with epidemics, due in part to being capable of rapidly evolving and thereby avoiding immune responses.
PREVENTION & TREATMENT	Vaccines are available for the more common influenza (type A). Most people recover from fever and other symptoms within a week, without requiring medical attention. Covering

SARS

Severe acute respiratory syndrome
VIRUS
(Coronavirus)

As with cholera in the 19th century, the fear of SARS in the 21st century was more palpable than any actual arrival of the disease in the city.

Despite its brief appearance on the world stage – occurring in Hong Kong, Guangdong, Hanoi, Singapore and Toronto (where there is a large Chinese population) – something of a ‘SARS frenzy’ unfolded in the popular media. This was fuelled when Chinese officials initially suppressed news of the outbreak in 2003 to prevent public panic. Health and immigration authorities in the Asia-Pacific region went into high alert, with passenger-temperature screening points quickly established at regional airport hubs, including at major Australian terminals. In April 2003, four children arrived in Melbourne from Toronto with flu-like symptoms. These suspected sufferers were later found to have another condition, but not before newspaper headlines screamed ‘Four more suspected cases!’

Polio

VIRUS
(Poliovirus) – of types 1, 2 and 3 wild polio viruses, type 2 has been eradicated since 1999

During the 20th century, Australia experienced a number of polio epidemics, affecting many thousands of individuals. Early cases stretched Melbourne’s hospital facilities, including the Fairfield Infectious Diseases Hospital, established in 1904.

The 1937 epidemic in the southern suburbs of Melbourne later spread to all parts of Victoria. Other epidemics occurred in Australia in the early 1940s and 1950s, before effective vaccines were found in the 1950s and comprehensive vaccination programs were delivered from the 1960s. Despite the eradication of polio in Australia (declared polio-free by the World Health Organisation in 2000), the disease has left a legacy; survivors moving here from other countries have replaced childhood infections as the new focus of interest for people suffering from polio. In 2013, more than 100,000 Australians were recorded as living with the later effects of polio. Unlike many other diseases, polio leaves permanent damage. Victoria’s post-polio networks provide a vital support role at local level for survivors, families and carers. Local support groups exist in places where polio first visited the city, before extending across the state. The disease revisits the lives of post-polio survivors as a painful legacy of earlier times.

HIV/AIDS

Human immunodeficiency virus (acquired immunodeficiency syndrome) VIRUS

Early public education campaigns about AIDS played on the primal fear of diseases throughout history. The AIDS and the Grim Reaper television ad lasted 60 seconds and ran for just three weeks, but it became one of the most famous ads in Australia’s history, with alarmist images of the Grim Reaper hurtling a bowling ball indiscriminately towards his next victims.

Prior to its closure in 1996, the Fairfield Infectious Diseases Hospital provided valuable treatment and palliative care to people suffering from HIV and AIDS in Melbourne. Other facilities have since taken over, with advice and other support for people in the Victorian community. Victorian AIDS diagnoses peaked in 1992–95, with 180 new cases (a vastly different scenario than in Sub-Saharan Africa). Treatments available since the 1990s have led to a drop to around 50 cases annually. Australia’s commitment to ending the HIV epidemic, both nationally and in the wider Asia-Pacific region, plus Melbourne’s credentials in science and medical research, were among the reasons the City of Melbourne and its partners were chosen to host the 20th International AIDS conference in July 2014.

Ebola

VIRUS

With significant death rates in West Africa, Ebola exemplifies the present-day fear of disease, challenging both border controls and disease tracking across porous international borders.

The threat of Ebola entering Australia responded to quickly. Typically, less than 20 people arrive in Australia each week from Ebola-affected countries of Sierra Leone, Liberia and Guinea. Australia began screening travellers from these countries on 9 August 2014, and was the first country to do so. Stronger border controls were also put in place. The Department of Immigration announced on 28 October 2014 that it would temporarily suspend assessment of visa applications for citizens of Ebola-affected countries, meaning they cannot enter Australia. Australians and citizens of other countries who have visited the affected areas are also carefully assessed. As an infectious disease still not under control, Ebola is one of several actively monitored internationally. It is presently included in Victoria’s emergency plans for managing a potential epidemic outbreak. The Victorian Infectious Diseases Reference Laboratory, in Carlton, safeguards Melbourne’s future protection from this and other virulent diseases. It forms part of the national and international network of frontline health facilities responsible for early detection and emergency response to worldwide epidemics.

Obesity

Overweight and obesity (not formally recognised as a disease by the AMA and various medical colleges); body mass index (BMI) is a simple index of weight for height commonly used to classify weight and obesity in adults

Melbourne is home to a highly urbanised population. The city is on track to overtake Sydney as Australia’s biggest city by 2056, when its population is expected to hit between eight and nine million people. En route to reaching that figure, the Hoddle grid will be vertically challenged; private dwellings in the CBD are expected to increase from around 16,000 today to more than 40,000 by 2035.

Melbourne’s projected growth rates and expanding urban form are its own metaphor for parallel increases in obesity in the city’s population. The challenges of the 19th century were to overcome communicable diseases by providing a plentiful and clean water supply, sewerage, better diet and roomier housing, with well-drained streets. Protecting the future health of our growing urban population will require maintaining safe food, open space and clean urban environments – challenges facing Melbourne today.

Zika

VIRUS

Zika is known to circulate in Africa, Asia and the Pacific. The virus is spread by some species of Aedes mosquito, which can also be found in parts of northern Queensland.

Melbourne’s Infectious Diseases Reference Laboratory has tested 1500 Australians returning from overseas with an illness, with only seven testing positive for Zika since 2012.

SIGNS & SYMPTOMS	ORIGINS	TRACK RECORD	RISK FACTORS	PREVENTION & TREATMENT
Fever, chills, muscle aches and occasionally diarrhoea, progressing to high fever, dry cough, shortness of breath.	SARS first appeared in the highly populated Guangdong Province, China, in 2002. The coronavirus (from the same family as the common cold) is capable of a high mutation rate and is able to evolve into new strains. It is thought to have ‘jumped’ to humans from a pool of animal viruses living and mixing in local poultry and pig farms.	Between 2002 and 2003 the SARS outbreak peaked, with 8000 falling sick worldwide, although the fatality rate of two to three percent was low. Unsuspecting travellers carried the disease, passing it on through face-to-face contact and contaminated objects. No fresh cases have been recorded anywhere since 2004.	SARS is generally harder to catch than flu, and person-to-person infection from air travel was unlikely during the outbreak. To place the SARS epidemic into context, viral respiratory outbreaks commonly occur every two to three years in Asia, resulting in tens of thousands of deaths from influenza. Overcrowding, poverty and lack of housing infrastructure mean that once a virus has mutated into a new strain, it can spread rapidly in the population.	Antibiotics are ineffective on viruses, and antiviral drugs provided limited benefits during the outbreak. Vaccines remain untested on humans.
From mild flu-like symptoms (fever, fatigue, headache, vomiting, stiffness in neck and limb pains) to life-threatening paralysis (in less than one percent of cases), when breathing muscles become immobilised; post-polio syndrome can occur years after initial infection, with new symptoms of weakness, joint and muscle pain, and fatigue.	Polio infections extend to prehistory, and the disease has caused paralysis and death for much of human history. Epidemics were unknown until the 20th century, when it became one of the most feared diseases.	This highly infectious disease can cause paralysis in a matter of hours; the virus invades the nervous system, affecting the brain and spinal cord. It is transmitted person-to-person, mainly through faecal-oral pathways, and at its peak, in the 1940s and 1950s, polio paralysed or killed more than 500,000 people worldwide each year. Cases have decreased by more than 99 percent since 1988, from an estimated 350,000 cases to 416 in 2013. Polio survivors are one of the largest disabled groups in the world, with 10–20 million survivors worldwide.	Risk is through contact with infected individuals and poor personal hygiene.	There is no cure for polio; it can only be prevented through multiple vaccinations beginning in early childhood.
May include swollen lymph nodes, weight loss, fever, diarrhoea and a cough (availability of antiviral treatments means that HIV is no longer a gradual progression to AIDS, and then to death).	First isolated in 1983, early strains of the disease are believed to have originated with chimpanzees and monkeys in remote Africa, before jumping to human populations.	HIV, not AIDS, is transmitted between people via the exchange of body fluids from infected individuals, such as blood, breast milk, semen and vaginal secretions. The virus targets the immune system and weakens people’s defence systems against infections and some types of cancer. The World Health Organisation reports that in 2014, 36.9 million people were living with HIV in the world, many living in Sub-Saharan Africa. In that part of the world, tuberculosis is a leading opportunistic infection responsible for killing nearly 360,000 people living with HIV each year.	These include having unprotected sex, sharing contaminated needles and other injecting equipment when injecting drugs, receiving unsafe blood injections, transfusions or medical procedures that involve unsterile equipment.	Prevention measures include avoiding the risk factors. Antiviral drug treatments are also available for infected people.
Can include high fever, muscle aches, stomach pain, diarrhoea, sore throat, hiccups, and red and itchy eyes; and later, vomiting blood, bleeding nose, massive internal bleeding and death.	Ebola first appeared in 1976, simultaneously in Sudan and the Democratic Republic of Congo. The latter occurred in a village near the Ebola River, from which the disease takes its name.	This highly contagious disease is transmitted by contact with blood, faeces, or body fluids from an infected person, or from objects that have been in contact with an infected person. The current outbreak in West Africa (first notified in March 2014) – most severely affecting Guinea, Liberia and Sierra Leone – is the largest and most complex since the disease was discovered, involving urban and rural areas. Around 15,000 cases have been confirmed, with the death rate exceeding 10,000. Case fatality rates have varied from 25 to 90 percent in past outbreaks, with the average now around 50 percent.	Risks can be reduced by avoiding contact with infected people, including body fluids and infected corpses.	Early supportive care with hydration and symptom treatment improves survival. A range of blood, immunological and drug therapies are being developed for treatment, and good hygiene and a clean environment assist in prevention.
Abnormal or excessive fat accumulation that may impair a person’s health; World Health Organisation definition of ‘overweight’ is a BMI greater than or equal to 25, ‘obese’ defined as greater than or equal to 30 BMI.	Worldwide, obesity has more than doubled since 1990. Once considered a high-income-country problem, obesity is now on the rise in low- and middle-income countries, particularly in urban settings.	In Australia, approximately one person in four is affected by obesity. Worldwide in 2014, more than 1.9 billion adults were overweight. Of these, more than 600 million were obese. Some 42 million children under the age of five were overweight or obese in 2013.	Obesity is much more complex than an imbalance between what is consumed and the energy expended, although these are important underlying factors. Other ‘drivers’ include genetic, physiological, metabolic, social, environmental and psychological factors.	Obesity is preventable.
While there are often no symptoms, in around one-fifth of cases the infection can cause an illness with fever, rash, conjunctivitis, severe headache and muscle pain.	Zika, a mosquito-borne virus, was first detected in rhesus monkeys in Uganda in 1947, before being identified in humans in 1952. Recent outbreaks have occurred in French Polynesia (2013) and Brazil (2015).	On 2 February 2016, the World Health Organisation declared the Zika virus a global health emergency, following concern the virus could spread explosively and infect up to four million people in the Americas.	Contact with mosquitoes potentially infected with Zika virus should be avoided. Specific concerns have been raised that in pregnant women the virus may cause certain birth defects (microcephaly in babies).	Infections don’t normally require hospitalisation, but until a vaccine is developed, the best form of prevention is to avoid being bitten by mosquitoes when in countries affected by Zika.

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Images:

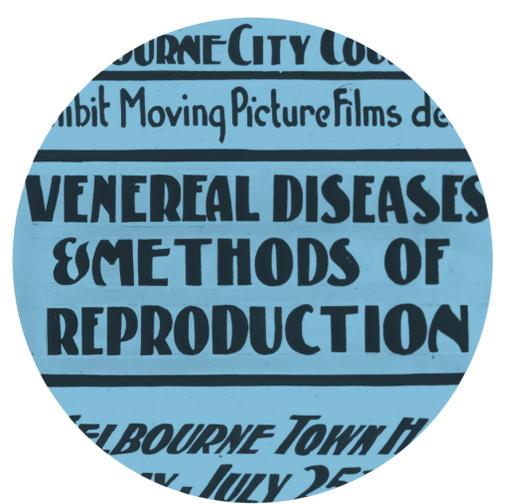
- ‘Kill that Rat’ Poster (detail)
City of Melbourne, Art and Heritage Collection
- ‘Honorary Help. The only physician who is regular in his attendance at the Melbourne Hospital’
Melbourne Punch, 6 September 1877 (detail)
State Library of Victoria
- Glass Lantern Slide (detail)
City of Melbourne, Art and Heritage Collection
- Premier entering condemned house, c. 1935 (detail)
Photographer: F. Oswald Barnett.
State Library Victoria



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SIGNS & SYMPTOMS	ORIGINS	TRACK RECORD	RISK FACTORS	PREVENTION & TREATMENT
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CITY OF MELBOURNE