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| Foodborne illness |
| Reporting on 2018 and 2019 |

# The Australian Foodborne Illness Reduction Strategy 2018-2021

In April 2017, the Australia and New Zealand Ministerial Forum on Food Regulation (the Forum) agreed that the food regulation system is producing strong food safety outcomes overall and identified three priority areas for 2018 to 2021 and beyond. One of these priorities is to reduce foodborne illness, particularly related to *Campylobacter* and *Salmonella*. Forum Ministers[[1]](#footnote-1) – including the Victorian Minister for Health and the Minister for Agriculture – requested the development of an Australian strategy, noting that New Zealand had an existing strategy for both pathogens. They recognised that success requires a concerted national effort, collaboration and partnerships across the food supply chain. The *Australian Foodborne Illness Reduction Strategy 2018-2021*+ was endorsed on 29 June 2018.

## The Victorian Foodborne Illness Reduction Strategy 2019-2022

The *Victorian Salmonella Strategy 2017-2020* was in place and several activities were already underway. With the endorsement of a new national strategy, it was considered timely to review, incorporate and update, creating a new Victorian strategy. The *Victorian Foodborne Illness Reduction Strategy 2019-2022* is focused on the reduction of foodborne illness arising from *Salmonella* and *Campylobacter*, aligning with the national project. Due to recent outbreaks and higher mortality rate, the Victorian strategy also includes infections with *Listeria spp*.

There are more than 200 diseases that can be spread through food, the consequences of which can be severe or even fatal. Disease outbreaks linked to food are common and often preventable. Outcomes include lost productivity, impacts on lifestyle, medical expenses, damage to reputation for individual food businesses, commodities or even whole industries from foodborne illness, and can all result in a substantial burden for the Australian economy. Often the most serious complications arise in the most vulnerable populations including children, pregnant women, those who are older or people with a weakened immune system.

*Campylobacter* is the most commonly notified cause of gastroenteritis in Australia and campylobacteriosis was the most commonly notified enteric condition in Victoria, with 6,669 notifications received in 2018 and 7291 in 2019 (Table 1). The report *Foodborne Illness in Australia – annual incident circa 2010* estimated the median number of domestically acquired cases of gastroenteritis due to *Campylobacter* in Australia to be 234,000, including 3,200 hospitalisations and three deaths. Seventy-seven per cent of these cases were considered to be foodborne.

Foodborne disease outbreaks caused by *Salmonella* in Australia have significantly increased over the past 20 years and compared to many similar countries, we have one of the highest rates. There are an estimated 56,200 cases of salmonellosis per year, including 2,100 hospitalisations and 15 deaths. In Australia 72 per cent of these are considered to be foodborne. In 2018 there were 3,075 notifications for salmonellosis in Victoria and 3,197 in 2019 (Table 1).

All most all cases of listeriosis are considered to be of foodborne transmission. In Victoria in 2017 there were 151 notifications of *Listeria monocytogenes* in food, with 16 reported non-perinatal cases of listeriosis resulting in 14 hospitalisations and two deaths, and three perinatal cases, one resulting in foetal death. While the incidence of illness related to *Campylobacter* and *Salmonella* are considerably higher than for *Listeria*, case-fatality for listeriosis can be up to 30 per cent for vulnerable populations, compared with much lower rates for mortality attributed to campylobacteriosis and salmonellosis. There were 27 notifications of invasive listeriosis in 2018 and 12 in 2019 (Table 1).

Table 1, Human case notifications of infection caused by foodborne pathogens in Victoria

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| **Notifications** | **2018** | **2019** |
| *Campylobacter* | 6669 | 7291 |
| *Listeria* | 27 | 12 |
| *Salmonella* | 3075 | 3197 |

Foodborne illness can have a significant impact on public health, wellbeing, food production and processing industries. In Australia an estimated 4.1 million domestically acquired cases of foodborne gastroenteritis occur annually, at an estimated cost of $1.2 billion per year. A safe food supply chain is critical for food security and consumer trust both domestically and internationally. The *Victorian Foodborne Illness Reduction Strategy 2019–2022* aims to protect our consumers and our food industry from the impact of foodborne disease, resulting in safer food, healthier people and better business.

Foodborne disease is preventable, and everyone has a role to play. Success requires concerted effort, with collaboration and partnerships across the food supply chain. This Strategy is a collaboration between the Department of Health and Human Services’ Food Safety Unit, Communicable Diseases Prevention and Control Unit, Communicable Disease Epidemiology and Surveillance Unit, the Department of Jobs, Precincts and Regions, PrimeSafe and Dairy Food Safety Victoria. We work together with the common health goal to reduce the incidence of foodborne disease, presenting a ‘one health’ approach that recognises the inextricable link between human health, animals and the environment.

## Uncovering the sources of *Campylobacter spp.*

Campylobacteriosis is one of the most common foodborne illnesses, which can result in diarrhoea, fever and abdominal cramps. It is the result of infection with the bacteria from the *Campylobacter* species. Australia has high notification rates for campylobacteriosis when compared with similar industrialised countries. Therefore, the the department wants to better understand where it is coming from so appropriate steps can be taken to reduce the burden of disease from *Campylobacter spp*.

In order to better understand the contribution of different food (or other) sources to campylobacteriosis, the department, through the Food Safety Unit (the FSU), has partnered with departmental colleagues, other jurisdictions and academic researchers in the National Health and Medical Research Council-funded CampySource project. The aim of this study is to use whole genome sequencing and source attribution modelling to determine the proportion that food (or other) sources are contributing to the burden of disease in Australia.

For this project, the FSU collected 148 samples of retail chicken meat between October 2017 and May 2018. This included 107 samples of retail chicken meat and 41 samples of chicken offal. These samples were tested for the presence of *Campylobacter spp*. It was found that 96 per cent of chicken meat samples collected in Victoria were positive for *Campylobacter spp.* This compared with 84 per cent of chicken meat samples from New South Wales and 90 per cent of chicken meat samples from Queensland. In addition, 88 per cent of Victorian chicken offal samples were positive for *Campylobacter spp.* compared with 83 per cent in New South Wales and 65 per cent in Queensland. The difference between the prevalence rates in the different jurisdictions was not explored further but may be a result of different testing procedures in the different laboratories or different climatic conditions.

The results of this testing were reported in the *Journal of Food Protection*, which is an international peer-reviewed scientific journal[[2]](#footnote-2). Publications of this sort contribute to greater understanding of this research within the wider scientific community.

All isolates of *Campylobacter spp.* from the Victorian chicken samples underwent whole genome sequencing at the Microbiological Diagnostic Unit-Public Health Laboratory at the University of Melbourne. This involved obtaining the full DNA sequence of every strain.

Knowing the DNA sequence can tell us several things about the *Campylobacter spp*. isolates. First, it can tell us how closely related different strains are to each other. It is important to understand whether isolates from the chicken are related to isolates from people who are ill and therefore, whether the chicken is likely to have been the source of infection. Second, it tells us what genes are present in the isolates. For example, we can look for genes that code for things such as antibiotic resistance.

The CampySource project is continuing to analyse the data that has been generated. Source attribution modelling (assigning the likelihood of infection to the different potential sources) is expected to be completed in 2020. In addition, further publications are expected from this project, including publications detailing the source attribution modelling, the genomics of food-associated isolates, and an assessment of the antimicrobial resistance profile of *Campylobacter spp*. from across Australia.

The CampySource project is an excellent example of a collaborative project that spans government jurisdictions, statutory authorities, public health laboratories, pathology laboratories and academic researchers, who can work together to answer important public health questions. With a national focus on reducing foodborne illness due to *Campylobacter* and *Salmonella*, understanding the contribution of different sources to the disease burden is critical for informing the most appropriate public health intervention strategies. One immediate take-home message for consumers is that chicken, and other raw meats, must be cooked properly to reduce the risk of campylobacteriosis. It is also important for consumers to separate raw and cooked foods and use clean utensils, cutting-boards, and containers for different foods.

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1. More information about the Joint Australia New Zealand Food Safety Regulation Framework, including the Forum, can be found on [health.vic](https://www2.health.vic.gov.au/public-health/food-safety/food-safety-laws-local-government-and-auditors/food-safety-laws-and-regulations/victorian-food-agencies) < <https://www2.health.vic.gov.au/public-health/food-safety/food-safety-laws-local-government-and-auditors/food-safety-laws-and-regulations/victorian-food-agencies>> [↑](#footnote-ref-1)
2. [Walker LJ](https://www.ncbi.nlm.nih.gov/pubmed/?term=Walker%20LJ%5BAuthor%5D&cauthor=true&cauthor_uid=31729918), [Wallace RL](https://www.ncbi.nlm.nih.gov/pubmed/?term=Wallace%20RL%5BAuthor%5D&cauthor=true&cauthor_uid=31729918), [Smith JJ](https://www.ncbi.nlm.nih.gov/pubmed/?term=Smith%20JJ%5BAuthor%5D&cauthor=true&cauthor_uid=31729918), [Graham T](https://www.ncbi.nlm.nih.gov/pubmed/?term=Graham%20T%5BAuthor%5D&cauthor=true&cauthor_uid=31729918), [Saputra T](https://www.ncbi.nlm.nih.gov/pubmed/?term=Saputra%20T%5BAuthor%5D&cauthor=true&cauthor_uid=31729918), [Symes S](https://www.ncbi.nlm.nih.gov/pubmed/?term=Symes%20S%5BAuthor%5D&cauthor=true&cauthor_uid=31729918), [Stylianopoulos A](https://www.ncbi.nlm.nih.gov/pubmed/?term=Stylianopoulos%20A%5BAuthor%5D&cauthor=true&cauthor_uid=31729918), [Polkinghorne BG](https://www.ncbi.nlm.nih.gov/pubmed/?term=Polkinghorne%20BG%5BAuthor%5D&cauthor=true&cauthor_uid=31729918), [Kirk MD](https://www.ncbi.nlm.nih.gov/pubmed/?term=Kirk%20MD%5BAuthor%5D&cauthor=true&cauthor_uid=31729918), [Glass K](https://www.ncbi.nlm.nih.gov/pubmed/?term=Glass%20K%5BAuthor%5D&cauthor=true&cauthor_uid=31729918)(2019) **Prevalence of *Campylobacter coli* and *Campylobacter jejuni* in Retail Chicken, Beef, Lamb, and Pork Products in Three Australian States.** [**J Food Prot.**](https://www.ncbi.nlm.nih.gov/pubmed/31729918)**2019 Dec;82(12):2126-2134** [↑](#footnote-ref-2)