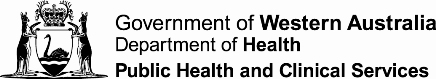
Foodborne disease surveillance and outbreak investigations in Western Australia, second quarter 2018



**Enhancing foodborne disease surveillance across Australia**



**Communicable Disease Control Directorate**

OzFoodNet, Communicable Disease Control Directorate

**Acknowledgments**

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**Disclaimer**:

Every endeavour has been made to ensure that the information provided in this document was accurate at the time of writing. However, infectious disease notification data are continuously updated and subject to change.

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# 

# Executive summary

During the second quarter of 2018 (2Q18), the Western Australian (WA) OzFoodNet team conducted surveillance of enteric diseases, undertook investigations into outbreaks and was involved with ongoing enteric disease research projects. The most common notifiable enteric infections in WA were campylobacteriosis (n=670), salmonellosis (n=579), shigellosis (n=58) and rotavirus infection (n=50) (Figure 1). Compared to the applicable 5-year second quarter means (2QM), there were substantial increases in notifications of salmonellosis (35%) and shigellosis (209%), a small increase in campylobacteriosis (5%) and a decrease in rotavirus (60%). The large increase in salmonellosis was primarily driven by an increase in *S.* Typhimurium MLVA type 03-17-09-12-523 notifications, while the shigellosis increase was driven by an increase in *S. flexneri* 2B, predominantly in Aboriginal people in the Kimberley and Pilbara regions. There were 15 foodborne outbreaks investigated in the second quarter, which was 3.75 times the 2QM (n=4). This included 11 outbreaks due to *Salmonella* Typhimurium of which four were associated with consumption of egg dishes. Nine outbreaks had unknown aetiology. OzFoodNet also conducted surveillance of 10 non-foodborne outbreaks. Of these, the most common mode of transmission was person-to-person (eight outbreaks), with a total of 210 people ill. Norovirus was the most commonly reported pathogen, being identified in 2 outbreaks.

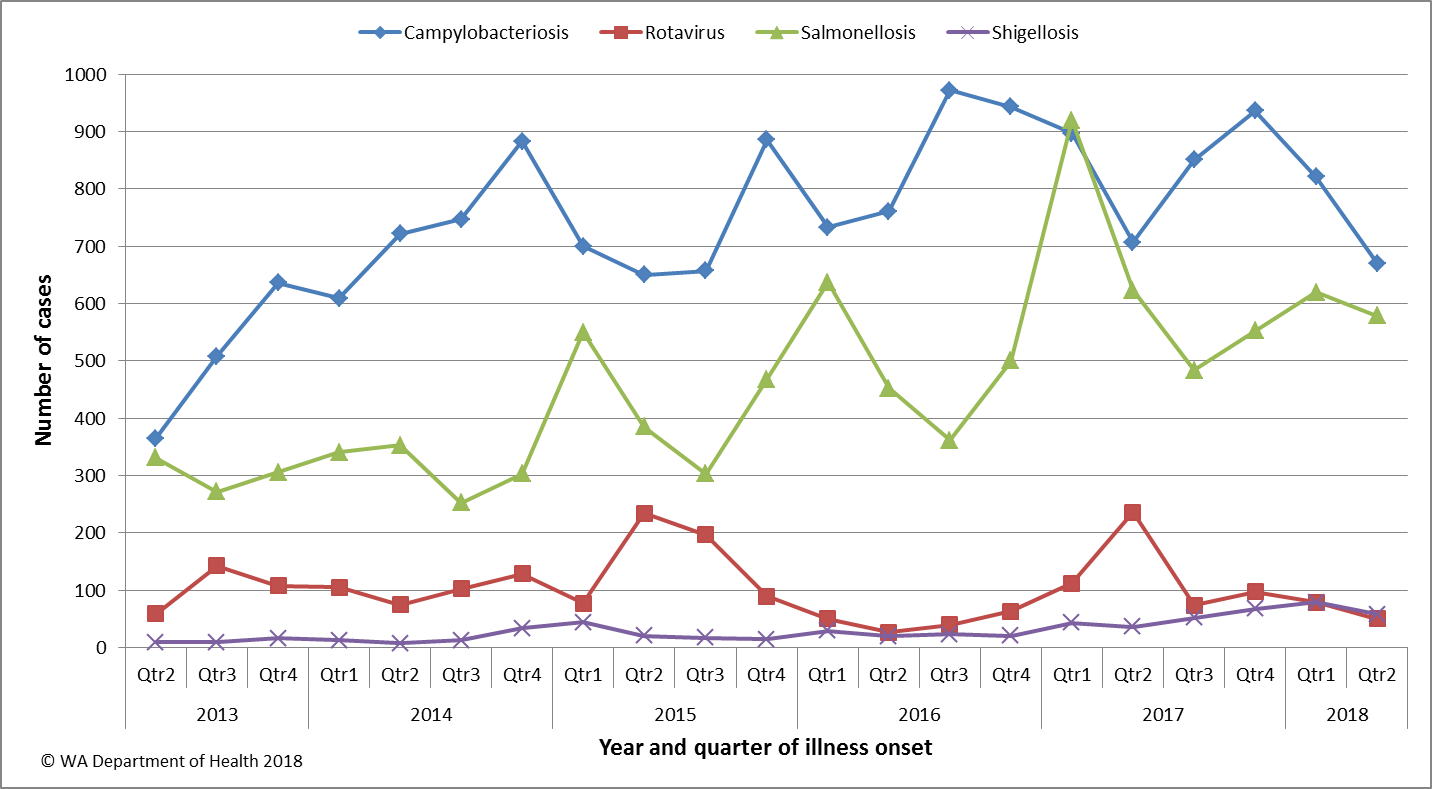


Figure 1: Notifications of the four most common enteric diseases by quarter from 2013 to 2018, WA

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**Notes:**

1. All data in this report are provisional and subject to future revision.
2. To help place the data in this report in perspective, comparisons with other reporting periods are provided. As no formal statistical testing has been conducted, some caution should be taken with interpretation.

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# Introduction

It has been estimated that there are 5.4 million cases of foodborne illness in Australia each year at a cost of $1.2 billion per year1. This is likely to be an underestimate of the total burden of gastrointestinal illness as not all enteric infections are caused by foodborne transmission. Other important modes of transmission include person-to-person, animal-to-person and waterborne transmission. Importantly, most of these infections are potentially preventable through interventions at the level of primary production, commercial food handling, households or institution infection control, as appropriate.

This report describes enteric disease surveillance and investigations carried out during the second quarter of 2018 by OzFoodNet WA, other Western Australian Department of Health (WA Health) agencies and local governments. Most of the data are derived from reports by doctors and laboratories to WA Health of 16 notifiable enteric diseases. In addition, outbreaks caused by non-notifiable enteric infections are also documented in this report, including norovirus, which causes a large burden of illness in residential (mostly aged) care facilities (RCF) and the general community.

OzFoodNet WA is part of the Communicable Disease Control Directorate (CDCD) within WA Health, and is also part of the National OzFoodNet network funded by the Commonwealth Department of Health2. The mission of OzFoodNet is to enhance surveillance of foodborne illness, including investigating and determining the cause of outbreaks. OzFoodNet also conducts applied research into associated risk factors and develops policies and guidelines related to enteric disease surveillance, investigation and control. The OzFoodNet site based in Perth is responsible for enteric disease surveillance and investigation in WA.

OzFoodNet WA regularly liaises with staff from: Public/Population Health Units (PHUs); the Environmental Health Directorate of WA Health (EHD); and the Food & Waters, Diagnostic and Molecular Epidemiology laboratories at PathWest Laboratory Medicine WA.

PHUs are responsible for a range of public health activities, including communicable disease control, within their respective administrative regions. The PHUs monitor RCF gastroenteritis outbreaks and provide infection control advice. The PHUs also conduct follow-up of sporadic cases of important enteric diseases including typhoid, paratyphoid and hepatitis A.

The EHD liaises with Local Government (LG) Environmental Health Officers (EHO) during the investigation of food businesses. PathWest Laboratory Medicine WA provides public health laboratory services for the surveillance and investigation of enteric disease.

# Incidence of notifiable enteric infections

## Methods

Enteric disease notifications were extracted from the Western Australian Notifiable Infectious Diseases Database (WANIDD) by optimal date of onset (ODOO) for the time period 1st April 2013 to 30th June 2018. The ODOO is a composite of the ‘true’ date of onset provided by the notifying doctor or obtained during case follow-up, the date of specimen collection for laboratory notified cases, and when neither of these dates is available, the date of notification by the doctor or laboratory, or the date of receipt of notification, whichever is earliest. Rates were calculated using estimated resident population data for WA from Rates Calculator version 9.5.5.1 (WA Health, Government of Western Australia), which is based on 2011 census data. Rates in this report were calculated for the second quarter and presented as the rate per 100 000 population and have not been adjusted for age.

## Campylobacteriosis

Campylobacteriosis was the most commonly notified enteric disease in WA during the second quarter of 2018 (2Q18), with 670 notifications and a rate of 24 cases per 100 000 population (Table 1). There was a 5% increase in campylobacteriosisnotifications in the 2Q18 compared with the 5-year second quarter mean (2QM) of 641 notifications. The small increase appeared to be due to sporadic disease, as there were no identified *Campylobacter* outbreaks during the 2Q18. Similar to previous quarters, at least some of the increase is likely to be due to the introduction of polymerase chain reaction (PCR) testing of faecal specimens by one large private pathology laboratory in 2014, and another private laboratory in 2016, which has greater sensitivity than culture techniques.

The place of acquisition of infection was reported for 55% (n=370) of cases, of which 64% (n=236) were locally acquired and 35% (n=130) were acquired overseas.

Table 1: Number of campylobacteriosis notifications, 2nd quarter 2018, WA, by region



**\***Percentage change in the number of notifications in the current quarter compared to the historical 5-year mean for the same quarter. Positive values indicate an increase when compared to the historical 5-year mean of the same quarter. Negative values indicate a decrease when compared to the historical 5-year mean of the same quarter. Percentage change should be interpreted with caution when the number of cases is small.

NA: not applicable as there is a 0 value in the calculation for the 2nd quarter % change

## Salmonellosis

Salmonellosis was the second most commonly notified enteric disease in WA in the 2Q18, with 579 notifications and a rate of 21 cases per 100 000 population (Table 2). The number of salmonellosisnotifications in the 2Q18 was 35% higher than the 2QM (n=429), with increases seen in all metro areas and some regional areas.

Place of acquisition of infection was reported for 79% (n=455) of cases, of which 80% (n=366) were locally acquired, 19% (n=88) were acquired overseas and <1% (n=1) was acquired interstate.

The most commonly reported *Salmonella* serotype was *S*. Typhimurium (STM) (n=324, 56%), and of those cases with information on place of acquisition (n=279, 86%), 96% of cases (n=269) were locally acquired. Multi locus variable number tandem repeat analysis (MLVA) is used to subtype STM in WA. The most common MLVA types for 2Q18 were 03-17-09-12-523 (n=154, 48%, PFGE type 0043), 03-10-17-11-496 (n=14, 4%, PFGE 0001), 03-17-9-11-523 (n=14, 4%, PFGE type 0043). The MLVA type 03-17-09-12-523 emerged in the 4Q16 and has been associated with a number of point source outbreaks (Sections 3 and 4).

Table 2: Number of salmonellosis notifications, 2nd quarter 2018, WA, by region



**\***Percentage change in the number of notifications in the current quarter compared to the historical 5-year mean for the same quarter. Positive values indicate an increase when compared to the historical 5-year mean of the same quarter. Negative values indicate a decrease when compared to the historical 5-year mean of the same quarter. Percentage change should be interpreted with caution when the number of cases is small.

*S*. Enteritidis was the second most common *Salmonella* serotype (n=43, 7%), with most (n=40, 93%) cases acquired overseas, primarily after travel to Indonesia (n=30, 75%).

*Salmonella* Saintpaulwas the third most common serotype (n=23), and of those cases with known place of acquisition, 90% of cases were acquired in WA. There were also 11 notifications of *Salmonella* Paratyphi B bv Java and of those with known place of acquisition, most (83%) were acquired overseas.

There were 22 notifications of *Salmonella* that had no serotype; for all of these Salmonella was detected using PCR, but an isolate could not be cultured or was not requested, so therefore serotype information are not available. Specimens that are subsequently culture negative remain as a “PCR only” notification but are still counted as a confirmed case.

## Shigellosis

In the 2Q18 there were 58 culture confirmed shigellosis notifications (2 cases per 100 000 population), a 209% increase compared to the 2QM (Table 4). The largest increases were in the remote rural regions of the Pilbara and Kimberley.

Most (74%) of the cases were diagnosed with *Shigella flexneri* 2b. On a statewide basis, of the cases with known Aboriginality status, 67% were Aboriginal and 33% were non-Aboriginal people. The median age was 22 years (range 1-76 years). Increases in S. *flexneri* 2b were also reported in South Australia (SA) and the Northern Territory (NT) since 2017. Public health actions and treatment protocols conducted in SA and NT were circulated to affected WA public health units for their information.

Table 3: Number of shigellosis notifications, 2nd quarter 2018, WA, by region



**\***Percentage change in the number of notifications in the current quarter compared to the historical 5-year mean for the same quarter. Positive values indicate an increase when compared to the historical 5-year mean of the same quarter. Negative values indicate a decrease when compared to the historical 5-year mean of the same quarter. Percentage change should be interpreted with caution when the number of cases is small. NA: not applicable as there is a 0 value in the calculation for the 2nd quarter % change

## Rotavirus infection

In the 2Q18 there were 50 notifications of rotavirus infection (1.8 cases per 100 000 population), a 60% decrease compared with the 2QM (Table 3). There were decreases in notifications in most public regions including the Kimberley, Pilbara and Goldfield regions which were associated with a decrease in epidemic activity, primarily in Aboriginal children. On a statewide basis, of the cases with known Aboriginality status, 79% were non-Aboriginal and 21% were Aboriginal people. The median age was <1 years (range <1-70 years).

Table 4: Number of rotavirus notifications, 2nd quarter 2018, WA, by region



\*Percentage change in the number of notifications in the current quarter compared to the historical 5-year mean for the same quarter. Positive values indicate an increase when compared to the historical 5-year mean of the same quarter. Negative values indicate a decrease when compared to the historical 5-year mean of the same quarter. Percentage change should be interpreted with caution when the number of cases is small.

NA: not applicable as there is a 0 value in the calculation for the 2nd quarter % change

## Other enteric diseases and foodborne illness

During the 2Q18, other enteric disease notifications included:

* **Cryptosporidiosis:** In the 2Q18 there were 30 cryptosporidiosis notifications (1 case per 100 000 population), a 65% decrease compared to the 2QM (Table 5). On a statewide basis, of the cases with known Aboriginality status, 82% were non-Aboriginal and 18% were Aboriginal people. The median age was 9 years (range <1-48 years). The place of acquisition of infection was reported for 67% (n=20) of cases of which 85% (n=17) were locally acquired.
* **Hepatitis A infection:** Three hepatitis A cases were notified in the 2Q18. One case with genotype IA had travelled to South Africa and had male-to-male sexual contact during their incubation period. The other two cases were both genotype IB, were locally acquired and associated with a national hepatitis A outbreak related to consumption of frozen pomegranates (see Section 3).
* ***Listeria*:** There were three non-pregnancy related cases of listeriosis during 2Q18, all of which were locally acquired. These three isolates were unrelated and did not match other 2018 WA cases.
* **Yersiniosis:** There were four cases of culture-positive yersiniosis notified in 2Q18. For the three cases for which place of acquisition were known, two cases acquired their illness in Western Australia and one acquired their illness in Tanzania.
* **Shiga toxin producing *E. coli* (STEC):** There were 14 cases notified in 2Q18 compared to 2.8 cases for the 2QM. Prior to 2016, testing for STEC was only carried out at one laboratory by culture of stool samples with bloody diarrhoea (macroscopic or history), and <1 to 2 cases were notified each year. The increase in cases in subsequent reporting periods, including in 2Q18, was likely due to this one laboratory introducing PCR testing for STEC on stool samples with bloody diarrhoea (macroscopic or history) in 2016, and introduction of PCR testing at another laboratory on any stool sample, if requested by the doctor. The 14 cases included six (43%) females and eight (57%) males, ranging in age from <1-85 years (median 30 years). Of the 14 cases, ten cases had an acute illness with a specific onset date and three of these cases had bloody diarrhoea. Two cases had ongoing or intermittent diarrhoea for many months and two experienced no diarrhoea. Five cases with acute illness had travelled during their incubation period, two to Indonesia, two to India and one to South Africa.
* **Paratyphoid fever:** There was one case of paratyphoid fever notified in the 2Q18 with travel to India prior to illness onset.
* ***Vibrio parahaemolyticus*:** There were three notifications of *Vibrio parahaemolyticus* in 2Q18. Two cases acquired their infection in Western Australia. Both had gastroenteritis with onset dates four days apart. A cluster investigation was conducted (see Section 4). The third case acquired their infection in Indonesia.
* **Haemolytic Uraemic Syndrome:** One case was notified in 2Q18. The case was culture positive for non-O157 STEC and had eaten a number of high risk foods including undercooked hamburger patty and variety of raw vegetables.

There were no notifications for botulism, cholera, hepatitis E or typhoid in the 2Q18.

Table 5: Summary of number of notified cases of enteric notifiable diseases in WA in the second quarter 2018 compared to historical means



Percentage change in the number of notifications in the current quarter compared to the historical 5-year mean for the same quarter. Positive values indicate an increase when compared to the historical 5-year mean of the same quarter. Negative values indicate a decrease when compared to the historical 5-year mean of the same quarter. Percentage change should be interpreted with caution when the number of cases is small.

NA: not applicable as there is a 0 value in the calculation for the 2nd quarter % change

# Foodborne and probable foodborne disease outbreaks

There were 15 foodborne or probable foodborne outbreaks identified and investigated in WA this quarter; as well as one multi-jurisdictional outbreak investigation with WA cases. The number of foodborne outbreaks in the 2Q18 was 3.75 fold higher than the 2QM (n=4).

## Residential care facility, unknown aetiology (outbreak code 05/18/GRA)

There were 12 residents in a residential care facility ill with gastroenteritis with onsets of illness from 28/04/18 to the 30/04/18. Of the 12 residents, two reported vomiting and 11 reported diarrhoea which lasted 1-2 days. Five specimens were negative for routine bacterial and viral pathogens and an extended viral panel (Astrovirus, Sapovirus, Enterovirus, Parechovirus and Adenovirus). Three specimens were further tested and were negative for *C. perfringens* (culture and toxin) and *B. cereus* (culture). Six of the residents were in the dementia wing and six residents were in the non-dementia wings. Information on food eaten by individual residents was not available. There was no report of interaction between ill dementia residents and other ill residents. Food was prepared onsite. Food samples (not same batches eaten by residents prior to illness) were negative for *S. aureus*, *C. perfringens* and *B. cereus*. Swabs of the vitamiser, handwash station and kitchen trolley had very high total plate counts. Transmission was probable foodborne and vehicle was unknown.

## Residential care facility, unknown aetiology (outbreak code 05/18/MER)

There were 12 residents in a residential care facility ill with diarrhoea only, with onset of illness on the 28/04/18. Diarrhoea duration was 1-2 days. Six stool specimens were tested and two specimens were culture positive for *C. perfringens*. Unfortunately, there were delays in PFGE typing of the isolates and the isolates could not be resuscitated for typing. Information on food eaten by individual residents was not available. Food was prepared onsite. Food samples (not same batches eaten by residents prior to illness) and swabs (including the vitamiser) were negative for *S. aureus*, *C. perfringens* and *B. cereus*. An environmental investigation did not identify any non-compliance. Transmission was probable foodborne and vehicle was unknown.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-008)

Eleven people from eight independent groups became ill with gastroenteritis after eating food from the same restaurant between the 23/03/2018 and 31/03/2018. Of the 11 cases, eight were diagnosed with *Salmonella* Typhimurium MLVA 03-26-17-12-523. Six females and five males were affected, with a median age of 28 years. The most common symptoms were diarrhoea 11/11 (100%), with median duration of 5 days, abdominal pain 8/11 (73%) and fever 8/11 (73%). Two people were hospitalised as a result of their illness. The median incubation period was 3.5 days. A case control study identified that a variety of foods were eaten by cases with hollandaise sauce (n=5) the most common single food item eaten by people who became ill, there was no statistical association between food and illness. Local Government EHOs inspected the food business and found both ‘raw’ and ‘lightly cooked’ egg sauces were served at the premises. The mode of transmission was probable foodborne and food vehicle was unknown.

## *Salmonella* Bovismorbificans

Isolates from five *S.* Bovismorbificans cases from two outbreaks (three from outbreak 042-2018-009, two from outbreak 042-2018-010) were typed using pulsed field gel electrophoresis (PFGE) and found to be indistinguishable using two different enzymes. The same isolates were typed using whole genome sequencing (WGS) and found to be closely related (5-10 SNPs [single nucleotide polymorphisms] difference), indicating a likely common source. WGS comparison of WA and Victorian case isolates found these to be unrelated (54-74 SNPs difference), indicating different sources for the WA and Victorian outbreaks.



## Minesite (outbreak code 042-2018-009)

Four cases of *Salmonella* Bovismorbificans were interviewed in April. Three were workers from the same mine site, all of whom had been at the site during their incubation period. An analytical study of mine site workers had a poor response rate. Of the 17 responders, an additional five reported illness. While a number of fresh produce items (carrot, cucumber, red onion) had elevated odds ratios, none were significantly associated with illness. The Local Government EHOs did not identify any significant issues with the mine site kitchen, but did note that workers were not provided with refrigeration or cooler bags / ice bricks for storage or transport of their meals on site. Mode of transmission was probable foodborne and the food vehicle was unknown.

## Cafe (outbreak code 042-2018-010)

Two diagnosed cases of *Salmonella* Bovismorbificans in March independently ate from the same kebab shop during their incubation period, with onsets 2 days apart. One case had a steak kebab with lettuce, tomato, onion and garlic sauce and the other had a chicken kebab with lettuce, tomato, onion, cheese and tomato sauce. Local Government EHOs identified several areas of non-compliance including inadequate temperature control and inadequate hand washing. Mode of transmission was probable foodborne and the food vehicle was kebabs.

## Café, *Salmonella* Typhimurium (outbreak code 042-2018-011)

Five people in four independent groups became ill with gastroenteritis after eating food from the same café between the 19/03/18 and 15/04/18. Of the five cases, four were diagnosed with *Salmonella* Typhimurium MLVA 03-17-09-12-523 and two males and three females with a median age of 56 years. The most common symptoms were diarrhoea 5/5 (100%), with median duration of 4 days, abdominal pain 3/3 (100%) and fever 2/3 (67%). One (20%) person had bloody diarrhoea and one person was hospitalised as a result of their illness. Median incubation period was 6 days. Cases ate a range of different foods including beef salsa wrap, lasagne, Thai chicken noodle salad and chicken and salad focaccia shared by two cases. It was not determined if a common ingredient was shared by the majority of the dishes. Local Government EHOs inspected the food business and found no significant issues. No raw egg sauces were used. Four dishes were sampled and were negative for *Salmonella*. The food vehicle was recorded as unknown as no one food or ingredient could be implicated. Mode of transmission was probable foodborne.

## Minesite, *Salmonella* Typhimurium (outbreak code 042-2018-012)

Two diagnosed cases of *S*. Typhimurium MLVA 03-17-09-12-523 stayed at the same worksite and ate food from the onsite food hall during their incubation period. The two cases had onsets on the 31/03/18 and 17/04/18, respectively. Both had eaten a variety of dishes all from the onsite kitchen including runny eggs for breakfast. One case had bloody diarrhoea and neither were hospitalised. The site medical officer indicated there were no other reports of gastroenteritis since one case on 18/03/18. This outbreak was referred to Local Government, who had inspected the food business the week prior to the notification and found no issues, so no further follow up was undertaken. During that visit, no food or environmental samples were collected. The egg brand used at the mine site was unknown. Mode of transmission was probable foodborne and the food vehicle was unknown.

## Residential College, *Salmonella* Typhimurium (outbreak code 042-2018-013)

Two cases of STM MLVA 03-17-09-12-523 were interviewed and both had illness onset on the 26/04/2018. The cases were residents at the same student accommodation site and reported that other students were also ill at the same time. There were approximately 220 students in the accommodation and food was prepared on site. A case control study was conducted and 80 people completed the questionnaire asking about illness and food exposures from 23/04/18 to 26/04/18. Of the 80 respondents, 67 were well people and 13 were cases with onsets from 23/04/18 to 30/04/18. Of the cases, eight were males and five were females, with a median age of 20 years. All cases had diarrhoea, one (8%) had bloody diarrhoea and two cases were hospitalised. The median incubation period was 2 days. Foods associated with illness were coleslaw eaten on 25/04/18 (eaten by 8/10 cases, P value=<0.001) and jam pudding eaten on 24/04/18 (eaten by 4/10 cases, P value=0.046). Based on the environmental health investigation it was determined that raw eggs were used to make aioli and the mayonnaise used in the coleslaw. These products were normally kept for up to 2 days rather than the recommended 24 hours. One staff member who became ill only ate accommodation food on the 25/04/18, which was the meal containing the coleslaw. Transmission was foodborne and the likely vehicle was coleslaw.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-014)

Nineteen people in twelve independent groups became ill with gastroenteritis after visiting a restaurant between the 28/04/18 and 1/05/18. All fifteen diagnosed cases were diagnosed with *Salmonella* Typhimurium MLVA 03-17-09-12-523. Of the 19 ill people, seven were male and 12 were female with a median age of 43 years. The most common symptoms were diarrhoea 19/19 (100%), with median duration of 10 days, abdominal pain 17/17 (100%), fever 12/16 (75%) and vomiting 12/16 (75%). Bloody diarrhoea was reported by 4/15 people (27%) and six people were hospitalised as a result of their illness. The median incubation period was 51 hours. Cases ate a range of dishes but the most commonly reported food items were mashed potato (11, 58%) and hollandaise sauce (10, 52%). A case control study was performed using the people that cases reported visiting the bistro with who remained well as controls. A total of 15 cases and seven controls were included and only the hollandaise sauce found to be statistically significant (P value 0.01). Local Government EHOs inspected the food business and found that sauces including hollandaise/ béarnaise and aioli were made using raw eggs. It was reported most dishes came with a raw egg sauce. Issues were found with sauces being kept for more than 24 hrs and serving bottles of sauces being left out of refrigeration for extended periods of time. Testing of food items including sauces (not the same batch as eaten by cases) were sampled and were negative for *Salmonella*. The brand of eggs used by the food business for preparing the implicated dishes has previously been implicated in outbreaks with this MLVA type. Mode of transmission was foodborne. The most likely food vehicle was hollandaise sauce.

## Cafe, *Salmonella* Typhimurium (outbreak code 042-2018-015)

Two diagnosed cases of *S*. Typhimurium MLVA 03-17-09-12-523 from two independent groups ate food at the same restaurant during their incubation period. The first case, with onset 29/04/18, dined at the café on 25/04/18 and shared a meal of a chicken Caesar salad wrap and a chicken couscous salad with their husband, who remained well. The second case, with onset 30/04/18, ate a pumpkin and quinoa salad at the café on 27/04/18. They dined with two others who ate burgers and remained well. One case had bloody diarrhoea and neither were hospitalised. This outbreak was referred to Local Government who visited the food business and found no issues. No raw egg sauces were used to prepare the dish. No food or environmental samples were collected. The mode of transmission was probable foodborne. The food vehicle was recorded as unknown.

## Takeaway, *Salmonella* Typhimurium (outbreak code 042-2018-016)

In May 2018 there were 10 gastroenteritis cases (8 diagnosed with STM MLVA 03-17-09-12-523) from six groups who ate from the same takeaway outlet at a shopping centre food hall between 07/05/18 and 10/05/18. The median incubation period was 1.6 days. There were 5 male and 5 female cases, of whom two were hospitalised. A variety of foods were consumed by cases, including honey chicken, sweet and sour pork, chilli chicken, fried rice, egg noodles, Singapore noodles, garlic fish, potato patty, satay beef, beef and black bean, garlic mixed vegetables, and chicken curry. None of the foods were statistically associated with illness in a case-control study conducted as a part of this investigation. The most commonly consumed food among cases was honey chicken, with 8/10 cases eating this dish. Local Government inspected the food business and several non-compliances were identified. These included cross-contamination in food storage, post-cooking contamination, poor cooking practices, and poor cleaning of food handling equipment. An Infringement Notice was issued to the proprietors for the more serious breaches for which they had previously been made aware of. The responsible food vehicle was unknown. The mode of transmission was probable foodborne.

## Bakery, *Salmonella* Typhimurium (outbreak code 042-2018-017)

Eight diagnosed cases of STM MLVA 03-17-09-11-523 from seven independent groups had eaten food from the same bakery during their incubation period. The cases had eaten food between the 13/05/18 and 19/05/18. Of the eight people ill, four were male and four were female with a median age of 60.5 years. Symptoms included diarrhoea (8/8), median duration seven days, fever (6/8), and abdominal pain (7/8). One case experienced bloody diarrhoea and two were hospitalised. The median incubation period was 2 days. Cases had a filled roll or sandwich with a variety of filling options (n=5), scrambled eggs with a pie (n=1), soup with a buttered roll (n=1), and one could not recall their meal. An environmental investigation was conducted by the Local Government. The EHO found no significant issues with the premises. Whole boiled and peeled eggs were sourced from interstate. Pasteurised egg was used for mayonnaise sauces. One environmental and eight food samples collected were all negative for *Salmonella*. Mode of transmission was probable foodborne. The food vehicle was recorded as unknown.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-018)

An outbreak of gastroenteritis occurred after a group of 10 people had dinner at a restaurant, on 29/05/18. Following the dinner, six people from the group became ill with diarrhoea and/or vomiting, including three people diagnosed with STM MLVA 03-17-09-12-523. Two others from this group reported other gastroenteritis symptoms but no diarrhoea or vomiting, and did not have a specimen tested, so were excluded from the analytical study. A further diagnosed case of this STM MLVA type was identified who had dined at the restaurant, independent of the first group, on 01/06/18 with three others who remained well. In total, seven people met the case definition. The median age of cases was 24, with two male and five female cases. The median incubation period was 28 hours and median duration of diarrhoea was 4 days. No cases were hospitalised and one case reported bloody diarrhoea. The symptoms, incubation period and the duration of illness experienced were consistent with the salmonellosis diagnosis. An analytical study of the seven cases and five well controls from the two groups, identified consumption of deep-fried ice-cream and sweet and sour pork as both statistically associated with becoming ill (both with 5/7 cases and 0/5 controls; OR undefined, lower 95% CI 1.989, upper 95% CI undefined, P = 0.028). An environmental investigation was conducted by the Local Government. Samples of egg wash, desiccated coconut, uncooked fried ice cream and cooked fried ice cream tested positive for the same STM MLVA type as cases. Whole genome sequencing of the STM isolates from the clinical specimens and food samples confirmed the close relationship between them. The evidence collected supports the report of the outbreak as foodborne, and deep-fried ice-cream as the food vehicle.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-019)

Three cases from three independent groups became ill with diarrhoea between 27/05/18 and 28/05/18 after eating at the food business on 25/05/18. The three cases were diagnosed with *S*. Typhimurium MLVA 03-12-11-10-523. Two cases were female and one case was male, the ages of the cases were 34, 42, and 48 years. The duration of diarrhoea for the three cases was 7, 7 and 11 days. The incubation period was between 1 and 2 days. All three cases consumed a chocolate molten lava cake, made using eggs. A variety of other dishes were also consumed including gnocchi, slow cooked lamb, chips with duck gravy, duck with potato, grilled prawns, and quince and honey ice cream. These were not consumed by all cases and it was not apparent whether a high risk ingredient was common to these meals. Local Government EHOs inspected the food business. The implicated food item (not the same batch as eaten by cases), eggs, as well as environmental samples from the food business were all negative for *Salmonella*. There was insufficient evidence to suggest inadequate cooking of the lava cakes. Two egg brands used by the food business for preparing the implicated egg dishes were brands previously associated with this MLVA type in point source outbreaks. Mode of transmission was probable foodborne. The food vehicle was likely to have been the chocolate lava cake.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018- 020)

Two diagnosed cases of *S*. Typhimurium MLVA 03-11-17-11-496 from two independent groups ate food from the same restaurant during their incubation period. The first case dined with their partner at the restaurant on 03/06/18, and had an onset date of 04/06/18. This case ate a Turkish smoked salmon sandwich; the other person from the group ate a different meal. The second case dined with their partner and one other person at the restaurant also on 03/06/18, with diarrhoea onset 04/06/18. This case ate the same dish as the first case. The other people from this group had different dishes and did not become ill. The cases therefore had dishes unique to other known patrons who were within the two groups. One case was hospitalised. This outbreak was referred to Local Government who then visited the food business and found no issues. No raw egg sauces were used to prepare the dish. Mode of transmission was probable foodborne. The food vehicle was recorded as Turkish smoked salmon sandwich.

## Hepatitis A multi-jurisdictional outbreak investigation (MJOI) (outbreak code MJOI-2018-002)

From late March 2018, the OzFoodNet network investigated an increase in locally acquired hepatitis A cases with cases residing in NSW, QLD, WA and ACT. Following the investigation, there was a national recall of frozen pomegranate arils. Three hepatitis A cases resided in WA and all had eaten the frozen pomegranate arils. WA cases were all female, aged 14 to 23 years, two were hospitalised and onsets of illness were 4/03/18, 14/04/18 and 6/05/18.

# Cluster investigations

There was one ongoing and six new cluster investigations during the second quarter of 2018.

## *Salmonella* Typhimurium MLVA 03-17-09-12-523

STM MLVA 03-17-09-12-523 has been under investigation since the type emerged in September 2016 (see 4Q16 report). From September 2016 to June 2018 there were 954 cases notified, including 154 cases in 2Q18 (Figure 3). This MLVA type was the single most common MLVA type notified in 2Q18, constituting 48% of STM notifications for the quarter. Of the 154 cases, 32 (21%) were part of seven separate point source outbreaks in 2Q18. These 2Q18 outbreaks are detailed in Section 3. The remaining 122 cases, comprising 54% males and 46% females, ranged in age from <1 to 96 years (median 32 years), and most (89%) resided in the Perth metropolitan area. Hospitalisation data was confirmed for 119 community cases; 24% were hospitalised.

Dishes that contained raw or undercooked eggs were implicated in three of the seven point source outbreaks of STM 03-17-09-12-523 in the 2Q18. The DoH WA recommends the use of safer alternatives to raw egg based, ready to eat foods to both eliminate and control risks associated with consuming food which may be contaminated with food poising bacteria, including *Salmonella.* Two WA egg brands were implicated in these outbreaks. These brands have been linked to this MLVA type in previous point-source outbreaks. The vehicle was unknown in the other 2Q18 outbreaks of this MLVA type.

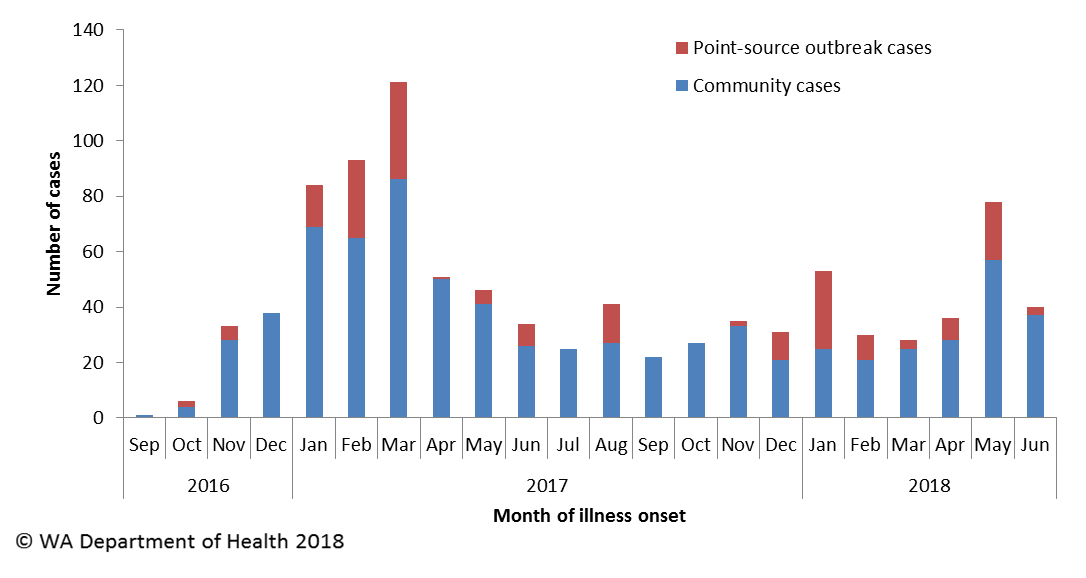


Figure 2: Notifications of *Salmonella* Typhimurium MLVA 03-17-09-12-523 in WA, 2016 to June 2018

## *Cryptosporidium*

In April 2018 there were five cases (20% male and 80% female, median age 16 years) of *Cryptosporidium* notified in the Great Southern region with onsets between 29/03/18 and 12/04/18 compared to a five year average of less than one case for the same period. All five cases were interviewed and four were locally acquired, with the last case recorded as unknown place of acquisition having spent the four days prior to their onset in Melbourne. Three cases had contact with cows during their incubation, however, there was no common association. No hypothesis for the cause of illness could be established.

## *Salmonella* Typhimurium MLVA 03-18-09-12-523

Three cases of STM 03-18-09-12-523 were notified in April 2018 and all were NMET residents. All cases were female, aged 1, 49 and 50 years. All were interviewed. Onsets were 09/04/18-13/04/18. Symptoms included diarrhoea (3/3) for 4 to 9 days, abdominal pain (3/3), lethargy (3/3), fever (2/3), vomiting (1/3), headache (1/2) and joint/muscle pain (1/2). One case reported bloody diarrhoea and one case was hospitalised. No common food businesses were identified. No hypothesis for the cause of illness could be established.

## *Salmonella* Typhimurium MLVA 03-16-09-12-523

Four cases of STM 03-16-09-12-523 were notified between 1/04/18 and 8/04/18 including two from the same suburb in the South West and two metro residents. Cases were two males and two females, aged <1-80 years (median 23 years). Three cases were interviewed. Symptoms included diarrhoea (3/3) for 14 to 17 days, abdominal pain (2/2), lethargy (3/3), fever (1/3) and joint/muscle pain (1/3). One case reported bloody diarrhoea and no cases was hospitalised. No hypothesis for the cause of illness could be established.

## *Salmonella* Havana

South Australia (SA) reported an increase in *S*. Havana above expected levels in June 2018 associated with sprouts only distributed within their jurisdiction (<https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/news+and+media/media+releases/salmonella+cases+linked+to+alfalfa+sprouts> ). In WA, there was one case of *S*. Havana with onset in late May and two cases with onsets in early June, compared to the five year average of 1.4 cases for May-June. All three cases, comprising one male and two females aged <1-67 years, were interviewed. One case reported eating pre-packaged sprouts from a local supermarket. The second case could not recall whether they had any sprouts during their incubation period. The third case was 5 months old and was not eating solid foods but was staying on a cattle station during their incubation period with people who worked on the station. The cases were unlikely to be linked to each other or to the cases from South Australia.

## *Salmonella* Bovismorbificans

In June 2018 there were three cases (one male and two female, median age 28 years) of *Salmonella* Bovismorbificans notified and all were from the Perth metropolitan area with specimen dates one day apart. All three cases were interviewed. All were locally-acquired and reported multiple food items in common but no common food businesses. No hypothesis for the cause of illness could be established.

## *Vibrio parahaemolyticus*

There were two notifications of locally-acquired *Vibrio parahaemolyticus* gastroenteritis in 2Q18 with onsets 29/04/18 and 03/05/18. Both cases had eaten raw oysters during their incubation period as their only high risk exposure. The first case ate the oysters at a catered party for 80 on 28/04/18 but there were no reports of illness in other attendees. The second case ate the oysters at a restaurant in the Perth metropolitan area on 02/05/18. These were shared with another person, and a third person had a separate serve but neither became unwell. Oysters at the party were from SA and WA. Oysters from the restaurant were from a different growing region in SA. No other cases consuming oysters grown in SA were identified locally, or in other jurisdictions. The cases were unlikely to be related.

# Non-foodborne disease outbreaks and outbreaks with an unknown mode of transmission

There were 10 outbreaks of enteric disease in this quarter that appeared to be non-foodborne (Table 6). Of these, eight outbreaks were ascribed to person-to-person transmission and two outbreaks had an unknown mode of transmission. A total of 210 people were affected in these 10 outbreaks, with five reported hospitalisations.

Table 6: Outbreaks with non-foodborne transmission, 2nd Quarter 2018, WA



1 Not all cases are diagnosed with the pathogen

2 Deaths temporally associated with gastroenteritis, but contribution to death not specified

## Person-to-person outbreaks

Of the eight non-foodborne outbreaks that were suspected to be due to person-to-person transmission, five (63%) outbreaks occurred in aged care facilities, two (25%) were in child care centres, and one (12%) in a school. The causative agent for two (25%) of these outbreaks was confirmed as norovirus. The remaining six (58%) outbreaks were of unknown aetiology as specimens were either not collected (n=5) or were negative for common bacterial and viral pathogens (n=1).

A total of 195 people were affected in these eight outbreaks, with five reporting hospitalisation. The number of person-to-person outbreaks in the 2Q18 was 61% lower than the fourth quarter 5-year mean (n=20).

## 5.2. Outbreaks with unknown mode of transmission

There were two outbreaks in this quarter with an undetermined mode of transmission, with 15 people ill and no reported hospitalisation.

Both of these outbreaks were in RCFs, where the predominant or only symptom was diarrhoea. These outbreaks were unlikely to be due to norovirus due to no or limited vomiting reported. In one outbreak the specimens collected were negative for common bacterial and viral pathogens. In the other outbreak the one specimen collected, while culture positive for *Clostridium perfringens*, was *C. perfringens* toxin negative. As this organism can be carried as a gut commensal in some people the outbreak was classified as unknown. This facility previously had a probable foodborne outbreak in this quarter (Section 3.1.).

# Site activities

During the second quarter of 2018, the following activities were conducted at the WA OzFoodNet site:

* Ongoing surveillance of foodborne disease in WA.
* Monitoring culture-independent nucleic acid amplification diagnostic testing in private laboratories and impact on notification rates.
* Investigation of 15 foodborne and probable foodborne outbreaks, as well as participation in a multi-jurisdictional outbreak investigation.
* Investigation and monitoring of 8 person-to-person gastroenteritis outbreaks and two outbreaks with unknown mode of transmission.
* Ongoing investigation of community-wide increases in *Salmonella* Typhimurium 03-17-09-12-523, and investigation of six clusters.
* Participation in an inter-agency working group developing WA Foodborne Illness Reduction Strategy that aims to reduce the record levels of foodborne salmonellosis.
* Interviewing *Salmonella* Enteritidis cases regarding travel status and attempting to identify risk factors in locally acquired cases.
* Participation in a combined meeting with the Department of Agriculture and Food and the Environmental Health Directorate and Communicable Disease Control Directorate to discuss zoonotic disease issues.
* Participation in bi-monthly combined Food Unit, OzFoodNet and PathWest meetings to help improve surveillance and investigation.
* Participation in monthly national OzFoodNet teleconferences.
* Provided enteric disease data, interpretation and advice upon request to Local Government environmental health officers, laboratory and public health unit staff.
* Commenced fortnightly meetings with Food Unit to help improve surveillance and investigation.
* Attended the national OzFoodNet face-to-face meeting in Alice Springs in May and gave a presentation entitled ‘Enteric disease in WA – have we closed the gap between Aboriginal and non-Aboriginal people?’.
* Membership of OzFoodNet and other National working groups on:
  + Foodborne disease tool kit
  + Hepatitis A Series of National Guidelines
  + Antimicrobial resistance in *Salmonella* isolates from egg laying environments.

# References

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