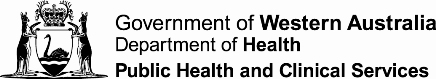
Foodborne disease surveillance and outbreak investigations in Western Australia, fourth quarter 2018



**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 fourth quarter of 2018 (4Q18), 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=1021), salmonellosis (n=445), rotavirus infection (n=95) and shigellosis (n=36) (Figure 1). Compared to the applicable 5-year fourth quarter means (4QM), there were increases in the number of notifications of campylobacteriosis (19%) and shigellosis (17%), the number of salmonellosis and rotavirus notifications were similar to the 4QM (4% increase and 3% decrease, respectively). The shigellosis increase was driven by an increase in *S. flexneri* 2B, predominantly in Aboriginal people in the Kimberley and Pilbara regions. There were seven foodborne outbreaks investigated in the fourth quarter, which was 1.3 times the 4QM (n=5.4). This included five outbreaks due to *Salmonella* Typhimurium of which three were associated with consumption of egg dishes. Two outbreaks had unknown aetiology. OzFoodNet also conducted surveillance of 41 non-foodborne outbreaks. Of these, the most common mode of transmission was person-to-person (38 outbreaks), with a total of 801 people ill. Norovirus was the most commonly reported pathogen, being identified in 13 outbreaks.

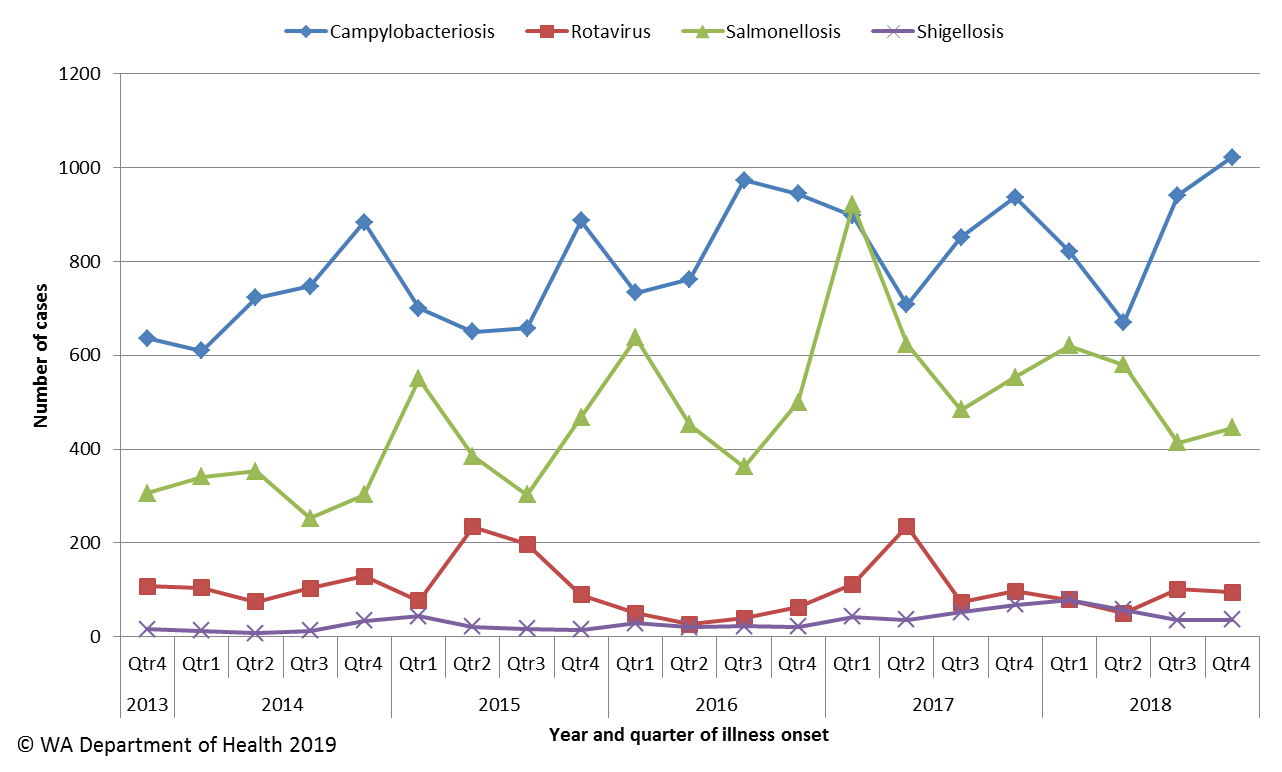


Figure 1: Notifications of the four most common enteric diseases by quarter from 2013 to 2018, WA

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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, household or institution infection control, as appropriate.

This report describes enteric disease surveillance and investigations carried out during the fourth quarter of 2018 by OzFoodNet WA in conjunction with 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 Surveillance 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 October 2013 to 31st December 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 (Epidemiology Branch, WA Health), which is based on 2011 census data. Rates in this report were calculated for the second quarter, are 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 fourth quarter of 2018 (4Q18), with 1021 notifications and a rate of 37 cases per 100 000 population (Table 1). There was a 19% increase in campylobacteriosisnotifications in the 4Q18 compared with the 5-year fourth quarter mean (4QM) of 857 notifications. The increase appeared to be due to sporadic disease, as there were no identified *Campylobacter* outbreaks during the 4Q18. 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 54% (n=548) of cases, of which 78% (n=425) were locally acquired and 21% (n=113) were acquired overseas.

Table 1: Number of campylobacteriosis notifications, 4th 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.

## Salmonellosis

Salmonellosis was the second most commonly notified enteric disease in WA in the 4Q18, with 445 notifications and a rate of 16 cases per 100 000 population. The number of salmonellosisnotifications in the 4Q18 was similar to the 4QM (n=426) (Table 2).

Place of acquisition of infection was reported for 74% (n=329) of cases, of which 73% (n=239) were locally acquired, 27% (n=88) were acquired overseas and <1% (n=2) were acquired interstate.

The most commonly reported *Salmonella* serotype was *S*. Typhimurium (STM) (n=217, 49%), and of those cases with information on place of acquisition (n=173, 80%), 97% of cases (n=168) were locally acquired. Multi locus variable number tandem repeat analysis (MLVA) is used to subtype STM in WA. The most common MLVA types for 4Q18 were 03-17-09-12-523 (n=70, 32%), 03-13-11-10-523 (n=15, 7%), 03-10-17-11-496 (n=9, 4%). 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, 4th 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 commonly notified *Salmonella* serotype (n=48, 11%), with most (n=44, 92%) cases acquired overseas, primarily after travel to Indonesia (n=32, 73%).

*Salmonella* Paratyphi B bv Javawas the third most commonly notified serotype (n=14), and of those cases with known place of acquisition, 57% of cases were acquired overseas. A local cluster was investigated in 4Q18 (Section 4). There were also 13 notifications of *Salmonella* Saintpaul and of those with known place of acquisition, most (90%) were acquired in WA.

There were 26 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.

## Rotavirus infection

In the 4Q18 there were 95 notifications of rotavirus infection (3.4 cases per 100 000 population), a similar number to the 4QM (Table 3). While there were decreases in notifications in most public regions, increases were noted in Great Southern, Wheatbelt and South Metro regions. On a statewide basis, of the cases with known Aboriginality status, 97% were non-Aboriginal and 3% were Aboriginal people. The median age was 3 years (range <1-92 years).

Table 3: Number of rotavirus notifications, 4th 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 4th quarter % change

## Shigellosis

On 1 July 2018 the case definition was changed to include notifications that are PCR positive as probable cases and culture positive notifications as confirmed shigellosis cases. In 4Q18 there were 27 probable shigellosis cases (1 cases per 100 000), these were all notified as *Shigella* species. Of the 27 probable cases 96% (n=26) were for metropolitan residents and of those with known travel, 86% (n=12) were acquired overseas.

In the 4Q18 there were 36 confirmed shigellosis cases (1.3 cases per 100 000 population), a 17% increase compared to the 4QM (Table 4). The place of acquisition of infection was reported for 56% (n=20) of cases, and of these, 85% (n=17) were acquired in WA. Of the 36 confirmed cases, 23 (64%) were Aboriginal people and 13 (36%) were non-Aboriginal people. The median age was 17 years (range 1-74 years).

*Shigella flexneri* was the most commonly notified species (n=28, 78%), with 21 cases of *S. flexneri* 2b, three cases of *S. flexneri* 2a and *S. flexneri* VAR X and one case of *S. flexneri* 3b. There were seven cases of *S. sonnei*, including six *S. sonnei* biotype G and one *S. sonnei* biotype F. There was also one case of *S. dysenteriae* (Phage type 9) with unknown travel history. The highest number of notifications were in the Pilbara and Kimberley regions, with most (n=14, 78%) cases diagnosed with *S. flexneri* 2B. From April 2017 increases in *S. flexneri* 2B were also reported in South Australia (SA) and the Northern Territory (NT).

Table 4: Number of shigellosis notifications, 4th 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 4th quarter % change

## Other enteric diseases and foodborne illness

During the 4Q18, other enteric disease notifications included:

* **Cryptosporidiosis:** In the 4Q18 there were 36 cryptosporidiosis notifications, a 29% decrease compared to the 4QM (Table 5). On a statewide basis, of the cases with known Aboriginality status, 76% were non-Aboriginal and 24% were Aboriginal people. The median age was 8 years (range <1-56 years). The place of acquisition of infection was reported for 64% (n=21) of cases of which 81% (n=17) were locally acquired.
* **Hepatitis A infection:** Five hepatitis A cases were notified in the 4Q18. Four cases were overseas acquired following travel to Somalia, Sudan, Pakistan and Columbia respectively. The other case was locally acquired and associated with a national hepatitis A outbreak related to consumption of frozen pomegranates investigated earlier in the year (see [OzFoodNet 2018 2nd quarter report](http://ww2.health.wa.gov.au/Articles/F_I/Infectious-disease-data/Enteric-infection-reports-and-publications-OzFoodNet)).
* **Hepatitis E infection:** Two hepatitis E cases were notified in the 4Q18, one who had travelled to the UK and one who had travelled to Europe and Thailand.
* ***Listeria*:** There was one non-pregnancy related cases of listeriosis during 4Q18.
* **Paratyphoid fever:** There were five cases of paratyphoid fever notified in the 4Q18. All cases were acquired overseas from India (n=2), Bangladesh (n=2) and Turkey (n=1).
* **Shiga toxin producing *E. coli* (STEC):** There were 35 cases notified in 4Q18 compared to 7.4 cases for the 4QM. 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 4Q18, 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 in 2016, which as of November 2018 is done on every stool sample requesting culture. The 35 cases included 19 (54%) females and 16 (46%) males, ranging in age from <1-76 years (median 27 years). Of the 35 cases, 24 cases had an acute illness with a specific onset date and seven of these cases had bloody diarrhoea. Four cases with acute illness had travelled during their incubation period, all had been to Bali. Of the eleven cases that did not have a specific onset date, four had ongoing or intermittent diarrhoea for many months, one experienced no diarrhoea and six were not able to be interviewed.
* **Typhoid fever:** There were four cases of typhoid fever notified in the 4Q18. Three cases had travelled to India prior to illness onset and one was acquired in Zambia.
* ***Vibrio parahaemolyticus*:** There were two notifications of *Vibrio parahaemolyticus* in 4Q18. Both cases acquired their infection overseas, in Thailand and Indonesia.
* **Yersiniosis:** There were three cases of culture-positive yersiniosis notified in 4Q18. One case acquired their illness in Indonesia; the place of acquisition was unknown for the other two cases.

There were no notifications for botulism, cholera, or Haemolytic Uraemic Syndrome in the 4Q18.

Table 5: Summary of number of notified cases of enteric notifiable diseases in WA in the fourth 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.

\**\*Shigella* culture confirmed cases only

NA: not applicable as there is a 0 value in the calculation for the 4th quarter % change

# Foodborne and probable foodborne disease outbreaks

There were seven foodborne or probable foodborne outbreaks identified and investigated in WA this quarter. The number of foodborne outbreaks in the 4Q18 was 1.3 fold higher than the 4QM (n=5.4).

## Workplace, unknown aetiology (outbreak code 10/18/WPE)

Approximately 20 people from a workplace attended a training event on 18/10/18. A catering business provided the food, which consisted of a variety of sandwiches. Sandwiches that were not consumed at the training were shared with the rest of the staff after the training and on the following day. Of the 180 employees at the workplace, 45 were initially reported to have diarrhoea and/or vomiting. A questionnaire was sent out to all 180 staff asking about exposure and illness details. Twenty-four respondents that met the case definition and 48 controls were used for analysis. The incubation period averaged 1 day. Symptoms included diarrhoea 16/24 (67%), median duration of 1 day, vomiting 17/24 (71%), fever 18/24 (75%), and abdominal pain 18/24 (18/24%). No cases were hospitalised. The one stool sample collected was positive for *Campylobacter*, the result was thought to be an incidental finding and not related to the outbreak. Symptoms, incubation period and duration of illness were typical of a viral gastrointestinal pathogen suggesting possible transmission between staff. Consumption of any sandwich (Odds Ratio [OR] 156, 95% confidence interval [CI] 15-1619) and consumption of other foods (OR 64, 95% CI 5-902) were statistically associated with illness in the analytical study. The EHO conducted investigation of the catering business that supplied the sandwiches for the work function. The finding that three sandwich samples taken from the caterer were positive for *E. coli*, one above the critical level, and overall high bacterial counts, indicated possible faecal contamination. The EHO identified a number of areas of improvement in hygiene of food handlers, food display and cleaning and sanitising of equipment. The mode of transmission was probable foodborne and the likely food vehicle was the sandwiches. It is unknown if the sandwiches were contaminated by a food handler before they arrived or by an infected staff member after delivery.

## Restaurant, unknown aetiology (outbreak code 11/18/MHP)

There were 19 cases in attendees to a catered event at a hotel on 11/11/18. Cases were ill between 12/11/18 and 13/12/18; cases reported symptoms of diarrhoea 16/19 (84%), median duration 36 hours, vomiting 17/19 (89%) and fever 17/19 (89%). One case reported bloody diarrhoea and no cases were hospitalised. A case control study was conducted and included 19 cases and 12 controls for analysis. The most frequently eaten foods by cases were the noodle salad 15/18 (OR 50, 95% CI 3.74-2306.65), steamed rice 14/18 (OR 0.7, 95% CI 0.05-6.13), and beef rissoles 12/19 (OR 0.64, 95% CI 0.08-4.06). Consumption of the noodle salad was found to be significantly associated with illness (P value < 0.001). There was no association between illness and the use of the toilet facilities. Two cases reported that one of their household contacts who did not attend the event became ill in the following seven days, which suggests that person-to-person transmission occurred, and therefore that the illness may have been caused by a gastrointestinal virus. An environmental investigation found no compliance issues in the kitchen and no reports of ill staff before or after the event. No food or environmental samples were collected. The mode of transmission was probable foodborne. The food vehicle was likely to be noodle salad.

## Prison, *Salmonella* Typhimurium (outbreak code 042-2018-028)

|  |
| --- |
| The local PHU was notified on 30/10/18 by the Department of Justice (DoJ) that an increased number of inmates at a prison had diarrhoea. A total of 10 inmates and one staff member reported gastroenteritis and four were positive for STM MLVA 03-11-15-10-523. Onset dates were between 27/10/18 and 5/11/18. Of the 11 cases, nine were male prison inmates, one was a female prison inmate and one a female staff member. Symptoms included diarrhoea (10/11), abdominal pain (10/11), fever (8/11) and vomiting (4/11). One inmate required hospitalisation. Seven of the 11 cases were kitchen staff. Of the four inmates who were not kitchen workers, it was not clear for three of them that they had any gastrointestinal symptoms consistent with salmonellosis, and none of the four had stool specimens taken. The EHO investigation focussed on raw egg milkshakes consumed by most inmates working in kitchen. Eggs used at the prison were from a prison farm. The mode of transmission was probable foodborne, and the likely food vehicle was raw egg milkshakes. |

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-029)

Ten people in seven independent groups became ill with gastroenteritis after visiting the same restaurant between the 2/11/18 and 8/11/18. All six diagnosed cases were diagnosed with STM MLVA 04-18-16-11-523. Of the ten ill people, eight were male and two were female, with a median age of 26 years. The most common symptoms were diarrhoea 10/10 (100%), with median duration of 7 days, abdominal pain 10/10 (100%) and fever 10/10 (100%), with vomiting reported by 8/10 (80%) people. Bloody diarrhoea was reported by 4/10 (40%) and two people were hospitalised as a result of their illness. The median incubation period was 25 hours. A case control study was undertaken with responses from nine cases and three controls. Cases ate a range of dishes; the most commonly reported food items were aioli 7/8 (88%) and chips 6/8 (75%), but no food was significantly associated with illness. EHOs inspected the food business and found that the aioli was made using raw eggs. A number of compliance issues were found including the use of visibly dirty eggs. Food and environmental samples taken were negative for *Salmonella*. The mode of transmission was foodborne. The food vehicle was likely to be aioli.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-030)

Three diagnosed cases of STM MLVA 03-17-11-12-523 from three independent groups ate food from the same restaurant during their incubation period. Symptoms included diarrhoea 3/3 (100%), median duration of seven days, fever 2/3 (67%) and abdominal pain 2/2 (100%). Two cases had bloody diarrhoea and no one was hospitalised. There were two people ill from two independent groups of two and four respectively who had both dined at the restaurant on the 27/10/18 with onsets on the 31/10/18 and 1/11/18. Both cases had scrambled eggs on toast, which was not eaten by other people who were not ill. The third case with onset on 15/11/18 had eaten a chicken burger on 6/11/18 with one other person who had a different dish and was not ill. The EHO investigation identified no issues. The mode of transmission was probable foodborne. The food vehicle was recorded as unknown.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-031)

Twenty eight people in seventeen independent groups became ill with gastroenteritis after eating food from the same restaurant between the 27/11/18 and 1/12/18. Of the 28 cases, 17 were diagnosed with STM MLVA 03-17-09-12-523 and one was diagnosed with *Salmonella*,not further typed. There were 14 males and 14 females with a median age of 33 years. The most common symptoms were diarrhoea 28/28 (100%), with median duration of 5 days, abdominal pain 23/26 (88%) and fever 22/26 (85%). There were 3/22 (14%) people with bloody diarrhoea and three people were hospitalised as a result of their illness. The median incubation period was 40 hours. The most commonly reported food was Vietnamese pork roll (banh mi) with pate, pickled carrot, cucumber, coriander, mayonnaise and the option of fresh chillies, reported by 26/28 (93%) cases. Of the remaining two cases, one reported having a beef and noodle soup which contained a partially boiled egg and the other had either a pork roll or the beef and noodle soup. EHOs inspected the food business and found compliance issues around storage, food preparation, cleaning and hygiene. The food business prepared a raw egg mayonnaise used in the pork rolls. Eleven food samples and four environmental swabs were negative for *Salmonella*. The food vehicle was recorded as the Vietnamese pork rolls prepared with raw egg mayonnaise. Mode of transmission was probable foodborne.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-032)

Three diagnosed cases of *Salmonella*, two with STM MLVA 03-17-09-12-523, from three independent groups had eaten from the same restaurant during their incubation period. The three cases had bought Vietnamese pork rolls from the restaurant between the 29/11/18 and 30/11/18 with illness onset on the 01/12/18. Symptoms included diarrhoea 3/3, with median duration of 4 days, fever 3/3 and abdominal pain 2/3. No cases experienced bloody diarrhoea and one case was hospitalised at the time, however, principally for other reasons. The incubation period was 1-2 days. An environmental investigation was conducted and no compliance issues were identified. The pork rolls were reportedly made using a commercially produced mayonnaise. No food or environmental samples were collected. Mode of transmission was probable foodborne. The food vehicle was recorded as Vietnamese pork rolls.

# Cluster investigations

There was one ongoing and eight new cluster investigations during the fourth 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 December 2018 there were 1109 cases notified, including 70 cases in 4Q18 (Figure 3). This MLVA type was the single most common MLVA type notified in 4Q18, constituting 32% of STM notifications for the quarter. Of the 70 cases, 23 (33%) were part of two separate point source outbreaks in 4Q18 and one outbreak investigated in the first quarter 2019 (1Q19). These 4Q18 outbreaks are detailed in Section 3. The remaining 47 cases, comprising 49% males and 51% females, ranged in age from <1 to 76 years (median 38 years), and most (96%) resided in the Perth metropolitan area. Hospitalisation data was confirmed for all 47 community cases; 23% were hospitalised.

Dishes that contained raw or undercooked eggs were implicated in one of the two point source outbreaks of STM 03-17-09-12-523 in the 4Q18. The DoH WA recommends safer alternatives to raw egg based, ready-to-eat foods are used to reduce risks associated with consuming food which may be contaminated with food poising bacteria, including *Salmonella.* The vehicle was unknown in the other 4Q18 outbreak of this MLVA type.

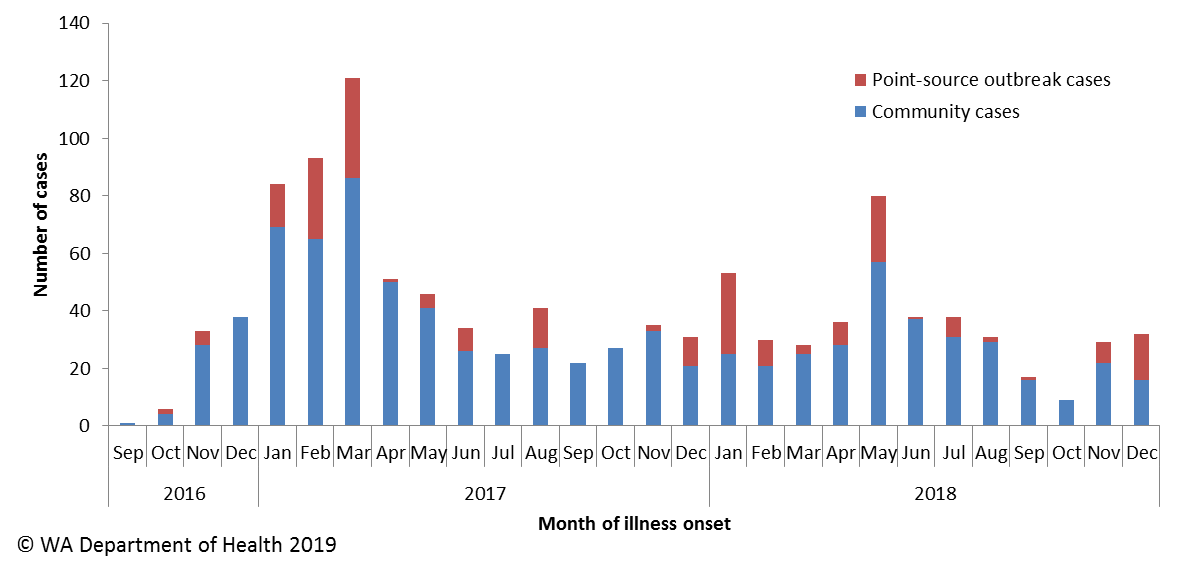


Figure 2: Notifications of *Salmonella* Typhimurium MLVA 03-17-09-12-523 in WA, 2016 to December 2018

## *Salmonella* Paratyphi B var Java

WA had 10 *S*. Paratyphi B bv Java notifications in September 2018, compared to a 5 year average of 4.6 for the month. Follow-up was conducted on nine cases to determine recent travel history. Most cases reported travel to Indonesia (n=4) or Thailand (n=2). Three cases had no recent travel. Two of them were residents of the same postcode, had both attended a local school sports carnival on the same day, and had illness onset one day apart. These cases were aged 1 and 6 years old, both had bloody diarrhoea, and neither were hospitalised. The third case had not attended the carnival, was a resident of a different public health region and was undertaking a practicum as a student nurse during their incubation period. Follow up regarding the sports carnival exposures was undertaken alongside a cluster investigation of STM MLVA 03-25-15-13-523, as cases were also potentially linked to the same sports carnival (see section 4.3). No hypothesis for the cause of illness could be established.

## *Salmonella* Typhimurium MLVA 03-25/26-15-13-523

In September there were three cases of STM MLVA 03-25-15-13-523 and one case of the closely related type STM 03-26-15-13-523 notified from the same postcode. The cases comprised three males and one female, aged 1-9 years (median age 4 years). The median duration of diarrhoea was 6 days, with 3/4 reporting bloody diarrhoea, and none were hospitalised. This cluster follows two cases of *S.* Paratyphi B var Java (6 year old male and a 1 year old female) from the same postcode who had both attended the local school carnival on the 07/09/18, with onset dates of the 09/09/18 and 10/09/18. Interviews with parents of the four STM cases revealed that two were students who attended the same sports carnival, with onset dates of 11/09/18 and 12/09/18; one also reported that a friend of the child was ill on 12/09/18 with similar symptoms, but was not tested. The other two cases both attended the same childcare; one had an onset of 7/09/18 and had no other exposures in common with other cases, but the other child, with an onset date of the 26/09/18, had a sibling who attended the sports carnival, and had gastroenteritis symptoms earlier in September. The school reported that no staff had been ill and there was no increase in the number of kids away from school during that time. It was confirmed that hotdogs were the only food served to students and family at the carnival. The other hypothesis was the possibility of environmental exposure at the local park where the sports carnival was held, particularly events in sand, which might contain animal faeces. However, parents could not confirm if any children would have had this exposure. In the end, no hypothesis for the cause of illness could be established.

## *Shigella flexneri* 2b

In October 2018 WA Health was informed of a gastroenteritis outbreak in a remote community, following two initial *Shigella* cases notified in September and early October, respectively. The town has a population of 400-500 which fluctuates when there are funerals and sorry camps in the town. It was reported that a large number of people were ill (possibly as many as half the town), however, there was only 15 reported gastroenteritis cases, which included three cases of *Shigella flexneri* 2b and one of *Shigella* species. There was also a temporally associated case of *Salmonella* Saintpaul, presumed to be unrelated to the outbreak. Since 2017 large increases in *Shigella* *flexneri* 2B have been noted in remote Indigenous communities in WA, NT and SA. Interventions to control local *Shigella* outbreaks were discussed with NT and SA epidemiologists, and these included increased testing, and use of antibiotics to reduce transmission. As shigellosis transmission is usually person-to-person, with social and environmental factors playing a large part, additional measures were implemented in the community, which included messaging about the importance of personal hygiene and hand washing and providing access to water and soap where possible, particularly in the sorry camps.

## *Salmonella* Typhimurium MLVA 03-13-15-10-523

There were three cases of STM MLVA 03-13-15-10-523 notified in November. No other cases of this MLVA were reported in 2018. All cases were female, the median age was 3 years (range 3-79 years), and all cases resided in the metropolitan area. The median duration of diarrhoea was 15 days, none were hospitalised. All three cases were interviewed but no common food business was identified. One case reported spending the entire incubation period in hospital, with no food from outside sources. All cases had eaten eggs during the incubation period, however, no common brand was reported. No hypothesis for the cause of illness could be established.

## *Salmonella* Typhimurium MLVA 03-25-18-11-523

There were four cases of STM MLVA 03-25-18-11-523 notified in November. Two (50%) were female and two (50%) were male, the median age was 26 years (range 6-54), and all cases resided in the metropolitan area. The median duration of diarrhoea was 8.5 days, none were hospitalised. Of the four cases, three were interviewed, including the parent of two notified siblings. No common food business was identified. All three cases interviewed reported egg consumption, however different egg brands were reported. No hypothesis for the cause of illness could be established.

## *Salmonella* Typhimurium MLVA 03-17-09-11-523

Six cases of STM MLVA 03-17-09-11-523 were notified in November, four cases were residents of the same town and two cases had visited the town during their incubation period. Cases were three males and three females, aged 1-66 years (median 25 years). Four cases were interviewed. Onset of diarrhoea was between 19/11/18 and 23/11/18, with median duration of 7 days. One case was hospitalised. All cases had reported either eating or handling eggs, but no common brands were identified, and no common venues were visited. Two cases not interviewed were from the same household, with an onset date recorded as the 10/11/18. This MLVA type has been involved in previous point source outbreaks implicating an egg or egg containing dish as the responsible food vehicle. No hypothesis for the cause of illness could be established.

## *Salmonella* Typhimurium MLVA 03-25-16-11-523

Five cases of STM MLVA 03-25-16-11-523 were notified in December in a number of neighbouring postcodes. Cases were all male aged 1-21 years (median age 10 years). All five cases were interviewed. Onsets were between 23/11/18 and 3/12/18. The median duration of diarrhoea was 9 days, with 2/4 reporting bloody diarrhoea, and none hospitalised. Exposures during their incubation periods included Asian takeaway, which was reported by all five cases. Three had Vietnamese pork rolls, with two likely to have come from the same takeaway, but this could not be confirmed. The third case had their pork roll from their mother’s bakery, which was not linked to the other rolls; the pork roll was made using raw egg mayonnaise. Consumption of raw or undercooked egg is the likely food vehicle, however, no hypothesis for common exposure could be established.

## *Salmonella* Typhimurium MLVA 03-13-11-10-523

Eight cases of STM MLVA 03-13-11-10-523 and one case of closely related MLVA 03-14-11-10-523 were notified in December in the same or neighbouring postcodes. Cases were five males and four females aged between 9-32 years (median 16 years). All cases were interviewed. Onsets were between 30/11/18 and 04/12/18. The median duration of diarrhoea was 8 days, four reported bloody diarrhoea, and two were hospitalised. Two cases reported eating independently from the same restaurant. Four cases had consumed eggs at home; two consumed the same brand. No hypothesis for cause of illness could be established.

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

There were 41 outbreaks of enteric disease in this quarter that appeared to be non-foodborne (Table 6). Of these, 38 outbreaks were ascribed to person-to-person transmission and three outbreaks had an unknown mode of transmission. A total of 874 people were affected in these 41 outbreaks, with 11 reported hospitalisations.

Table 6: Outbreaks with non-foodborne transmission, 4th 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 38 non-foodborne outbreaks that were suspected to be due to person-to-person transmission, 23 (61%) outbreaks occurred in aged care facilities, 10 (26%) were in child care centres, three (8%) were in schools and two (5%) in hospitals. The causative agent for 13 (34%) of these outbreaks was confirmed as norovirus. There was also one outbreak each confirmed as *Giardia*, adenovirus and a mixed adenovirus and rotavirus outbreak. The outbreak of mixed aetiology identified one positive sample of each pathogen. The remaining 22 (58%) outbreaks were of unknown aetiology as specimens were either not collected (n=13) or were negative for common bacterial and viral pathogens (n=9).

A total of 801 people were affected in these 38 outbreaks, with 11 reported hospitalisations. The number of person-to-person outbreaks in the 4Q18 was 11% lower than the fourth quarter 5-year mean (n=43).

## 5.2. Outbreaks with unknown mode of transmission

There were three outbreaks in this quarter with an undetermined mode of transmission, with 73 people ill and no reported hospitalisations.

Two of these outbreaks were in RCFs and one was in a hospital, where the predominant symptom was diarrhoea. These outbreaks were unlikely to be due to norovirus due to the limited vomiting reported. In the two RCF outbreaks the specimens collected were negative for common bacterial and viral pathogens. In the hospital outbreak no specimens were collected.

# Site activities

During the fourth 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 seven foodborne and probable foodborne outbreaks.
* Investigation and monitoring of 38 person-to-person gastroenteritis outbreaks and three outbreaks with unknown mode of transmission.
* Ongoing investigation of community-wide increases in *Salmonella* Typhimurium MLVA 03-17-09-12-523, and investigation of eight other clusters.
* Participation in an inter-agency working group developing the 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 quarterly combined EHD, 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.
* Participation in fortnightly meetings with EHD to help improve surveillance and investigation.
* Attended the national OzFoodNet face-to-face meeting in Canberra in November.
* 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.
  + National Policy for Reporting and Managing Communicable Disease Events on Cruise Ships
* Presented a talk on ‘Gastroenteritis outbreak management for aged care facilities’ at the Disease Control Update Day for South West residential aged care facility and infection control staff in Bunbury in October.
* Presented an enteric diseases update at the Public Health Nurses seminar in November.
* Contributed data for a DoH talk on *Salmonella* as part of the *Salmonella* workshop for regulators in Perth in October.
* Presented a talk on ‘Outbreak investigation from an epidemiological perspective’at the Avian Industry Consultative Group Meeting in Perth in October.
* Presented a talk on “Epidemic *Salmonella* Typhimurium in WA” at the 43rd National Conference of Environmental Health Australia in Perth in November.

# References

1. Hall G, Kirk MD, Becker N, Gregory JE, Unicomb L, Millard G, et al. Estimating foodborne gastroenteritis, Australia. Emerg Infect Dis. 2005;11(8):1257-1264.
2. OzFoodNet Working Group. A health network to enhance the surveillance of foodborne diseases in Australia. Department of Health and Ageing 2013. www.ozfoodnet.gov.au/internet/ozfoodnet/publishing.nsf/Content/Home-1 [14/03/2012].

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