Foodborne disease surveillance and outbreak investigations in Western Australia, first quarter 2016

**Enhancing foodborne disease surveillance across Australia**



**Communicable Disease Control Directorate**



OzFoodNet, Communicable Disease Control Directorate

**Acknowledgments**

Acknowledgement is given to the following people for their assistance with the activities described in this report: Mr Damien Bradford, Ms Lyn O’Reilly, Ms Jenny Green and the staff from the enteric, PCR and food laboratories at PathWest Laboratory Medicine WA; Mr John Coles and other staff from the Food Unit of the Department of Health, Western Australia; Public Health Nurses from the metropolitan and regional Population Health Units; and Local Government Environmental Health Officers.

**Contributors/Editors**

Nevada Pingault, Niki Foster and Barry Combs

Communicable Disease Control Directorate

Department of Health, Western Australia

PO Box 8172

Perth Business Centre

Western Australia 6849

Email: [OzfoodnetWA@health.wa.gov.au](mailto:OzfoodnetWA@health.wa.gov.au)

Telephone: (08) 9388 4999

Facsimile: (08) 9388 4877

Web:

OzFoodNet WA Health [www.public.health.wa.gov.au/3/605/2/ozfoodnet\_enteric\_infections\_reports.pm](http://www.public.health.wa.gov.au/3/605/2/ozfoodnet_enteric_infections_reports.pm)

OzFoodNet Department of Health

[www.ozfoodnet.gov.au/](http://www.ozfoodnet.gov.au/)

**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.

This publication has been produced by the **Department of Health, Western Australia**.

# 

# Executive summary

During the first quarter of 2016, 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=730), salmonellosis (n=637), cryptosporidiosis (n=89) and rotavirus infection (n=52) (Figure 1). Notifications of campylobacteriosis and salmonellosis were higher than the five-year first quarter mean, while rotavirus and cryptosporidiosis notifications were lower. The large increase in salmonellosis was driven by an increase in notifications of *S*. Typhimurium PFGE 0001.

Nine foodborne outbreaks were investigated in the first quarter, with six due to *S*. Typhimurium PFGE 0001 and associated with the consumption of egg dishes.

OzFoodNet also conducted surveillance of 31 non-foodborne outbreaks. Of these, the most common mode of transmission was person-to-person (26 outbreaks), with a total of 371 people ill. Norovirus was most commonly responsible (identified in 12 outbreaks), and most outbreaks were in aged care facilities.

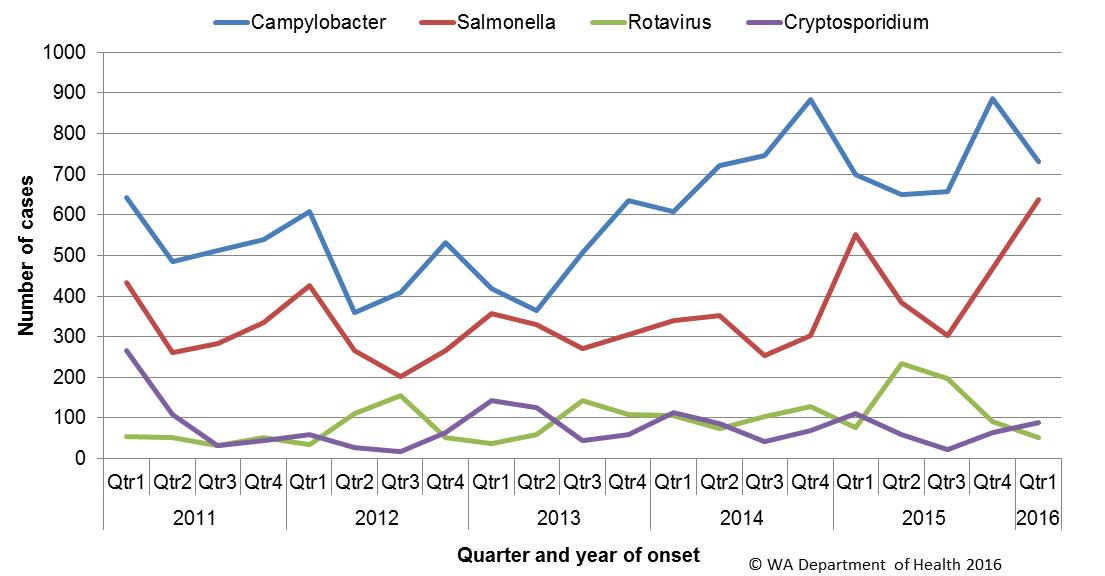


Figure 1 Notifications of the four most common enteric diseases by quarter from 2011 to 2016, WA

**Table of Contents**

[Executive summary 2](#_Toc488156331)

[1 Introduction 5](#_Toc488156332)

[2 Incidence of notifiable enteric infections 6](#_Toc488156333)

[2.1 Methods 6](#_Toc488156334)

[2.2 Campylobacteriosis 6](#_Toc488156335)

[2.3 Salmonellosis 7](#_Toc488156336)

[2.4 Cryptosporidiosis 9](#_Toc488156337)

[2.5 Rotavirus infection 9](#_Toc488156338)

[2.6 Other enteric diseases and foodborne illness 10](#_Toc488156339)

[3 Foodborne and suspected foodborne disease outbreaks 12](#_Toc488156340)

[3.1 Oysters, *Vibrio parahaemolyticus* (outbreak code 050-2016-001) 12](#_Toc488156341)

[3.2 Pork roll outbreak, *Salmonella* Typhimurium (outbreak code 042-2015-011) 13](#_Toc488156342)

[3.3 Religious festival outbreak, *Salmonella* Typhimurium (outbreak code 042-2016-001) 13](#_Toc488156343)

[3.4 Dinner party, *Salmonella* Typhimurium (outbreak code 042-2016-002) 13](#_Toc488156344)

[3.5 Cruise ship outbreak, *Salmonella* Enteritidis (outbreak code 042-2016-003) 14](#_Toc488156345)

[3.6 Mousse cake outbreak, *Salmonella* Typhimurium (outbreak code 042-2016-004) 14](#_Toc488156346)

[3.7 Café outbreak, Salmonella Typhimurium (outbreak code 042-2016-005) 15](#_Toc488156347)

[3.8 Restaurant outbreak, *Salmonella* Typhimurium (outbreak code 042-2016-007) 15](#_Toc488156348)

[3.9 Dinner party, *Salmonella* Typhimurium (Outbreak code 042-2016-009) 16](#_Toc488156349)

[4. Cluster investigations 16](#_Toc488156350)

[4.1. *Salmonella* Typhimurium PFGE 0001, PT 9 16](#_Toc488156351)

[4.2 *Salmonella* Eastbourne 17](#_Toc488156352)

[4.3 *Salmonella* Typhimurium MLVA 03-17-09-11-523 17](#_Toc488156353)

[4.4 *Salmonella* Kiambu 18](#_Toc488156354)

[4.5 *Salmonella* Paratyphi A 18](#_Toc488156355)

[5. Non-foodborne disease outbreaks and outbreaks with an unknown mode of transmission 18](#_Toc488156356)

[5.1. Person-to-person outbreaks 19](#_Toc488156357)

[5.2. Outbreaks with unknown mode of transmission 20](#_Toc488156358)

[6. Site activities 20](#_Toc488156359)

[7. References 21](#_Toc488156360)

**List of Tables**

[Table 1 Number of campylobacteriosis notifications, 1st quarter 2016, WA, by region 7](#_Toc454972865)

[Table 2 Number of salmonellosis notifications, 1st quarter 2016, WA, by region 8](#_Toc454972866)

[Table 3 Number of cryptosporidiosis notifications, 1st quarter 2016, WA, by region 9](#_Toc454972867)

[Table 4 Number of rotavirus notifications, 1st quarter 2016, WA, by region 10](#_Toc454972868)

[Table 5 Summary of number of notified cases of enteric notifiable diseases in WA in the first quarter 2016 compared to historical means 12](#_Toc454972869)

[Table 6 Outbreaks with non-foodborne transmission, 1st Quarter 2016, WA 19](#_Toc454972870)

**List of Figures**

[Figure 1 Notifications of the four most common enteric diseases by quarter from 2011 to 2016, WA 2](#_Toc454972871)

[Figure 2 Notifications of *Salmonella* Typhimurium PFGE 0001 in WA, May 2013 to March 2016 17](#_Toc454972872)

**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.

Copyright to this material is vested in the State of Western Australia unless otherwise indicated. Apart from any fair dealing for the purposes of private study, research, criticism or review, as permitted under the provisions of the Copyright Act 1968, no part may be reproduced or re-used for any purposes whatsoever without written permission of the State of Western Australia.

# 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 preventable through interventions at the level of primary production, commercial food handling, households and institution infection control.

This report describes enteric disease surveillance and investigations carried out during the first quarter of 2016 by OzFoodNet WA, other WA 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 Health Units (PHUs); the Food Unit in the Environmental Health Directorate of WA Health; and the Food Hygiene, 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 Food Unit liaises with Local Government (LG) Environmental Health Officers (EHO) during the investigation of food businesses. The Food Hygiene, Diagnostic and Molecular Epidemiology laboratories at PathWest Laboratory Medicine WA provide 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 January 2011 to 31st March 2016. 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 (WA Health, Government of Western Australia), which is based on 2011 census data. Rates calculated for this report have not been adjusted for age.

## Campylobacteriosis

Campylobacteriosis was the most commonly notified enteric disease in WA during the first quarter of 2016 (1Q16), with 730 notifications (Table 1) and a rate of 110 cases per 100 000 population per year. There was a 23% increase in campylobacteriosisnotifications in the 1Q16 compared with the five year 1st quarter mean (1QM) of 596 notifications. The increase appeared to be due to sporadic disease, as there were no identified *Campylobacter* outbreaks during the 1Q16. At least some of the increase is likely to be due to the introduction by one large private pathology laboratory of polymerase chain reaction (PCR) testing of faecal specimens, which has greater sensitivity than culture techniques.

The place of acquisition of infection was reported for 58% (n=422) of cases, of which 71% (300 cases) were locally acquired and 26% (111 cases) were acquired overseas.

Table 1 Number of campylobacteriosis notifications, 1st quarter 2016, WA, by region



**\***Percentage change in the number of notifications in the current quarter compared to the historical five-year mean for the same quarter. Positive values indicate an increase when compared to the historical five-year mean of the same quarter. Negative values indicate a decrease when compared to the historical five-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 1Q16, with 637 notifications (Table 2) and a rate of 96 cases per 100 000 population per year. The number of salmonellosisnotifications in the 1Q16 was 51% higher than the 1QM (n=422), with the increase occurring primarily in the Perth metropolitan and south-western corner of the state.

Place of acquisition of infection was reported for 72% (n=456) of cases, of which 73% (332 cases) were locally acquired, 26% (120 cases) were acquired overseas and 1% (4 cases) were acquired interstate.

The most commonly reported *Salmonella* serotype was *S*. Typhimurium (STM) (n=279, 44%), and of those cases with information on place of acquisition (n=206, 74%), 92% of cases (n=189) were locally acquired. Pulsed-field gel electrophoresis (PFGE) was previously used for subtyping of STM in WA, but as of the beginning of 2016, multi locus variable number tandem repeat analysis (MLVA) has replaced PFGE. The most common MLVA types for 1Q16 were 03-25-19-11-523 (n=50, 18%), 03-26-16-11-523 (n=32, 11%), 03-25-18-11-523 (n=18, 6%) and 03-15-16-11-523 (n=11, 4%), which are all analogous with PFGE type 0001; and 03-17-09-11-523 (n=16, 6%), which is analogous with PFGE 0043. There has been an ongoing community wide outbreak of PFGE 0001 in WA over the past two years (Section 4), including six identified point source outbreaks (Section 3) of this STM PFGE type.

Table 2 Number of salmonellosis notifications, 1st quarter 2016, WA, by region



**\***Percentage change in the number of notifications in the current quarter compared to the historical five-year mean for the same quarter. Positive values indicate an increase when compared to the historical five-year mean of the same quarter. Negative values indicate a decrease when compared to the historical five-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=61, 10%), with most (n=40, 66%) cases acquired overseas, primarily after travel to Indonesia (n=27, 68%), and almost exclusively to Bali. The place of acquisition was unknown for one case. In this quarter an outbreak of *S.* Enteritidis acquired on a cruise ship was investigated (Section 3).

*Salmonella* notifications that did not have a serotype were the next most common group (n=31). Most (87%) of these notifications were from one laboratory that first uses PCR screening for enteric pathogens. Specimens that are subsequently culture negative remain as a PCR only notification. The next most commonly notified *Salmonella* serotype was *S*. Paratyphi B bv Java (n=27), which is mostly acquired overseas.

## Cryptosporidiosis

In the 1Q16 there were 89 cryptosporidiosis notifications (Table 3) (13 cases per 100 000 population per year), a 36% decrease compared to the 1QM.

The place of acquisition of infection was reported for 64% of cases (n=57) of which 86% (49 cases) were locally acquired.

Table 3 Number of cryptosporidiosis notifications, 1st quarter 2016, WA, by region



**\***Percentage change in the number of notifications in the current quarter compared to the historical five-year mean for the same quarter. Positive values indicate an increase when compared to the historical five-year mean of the same quarter. Negative values indicate a decrease when compared to the historical five-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 1st quarter % change

## Rotavirus infection

In the 1Q16 there were 52 notifications (Table 4) of rotavirus infection (8 cases per 100 000 population per year), a 18% decrease compared with the mean of the previous four years. Notifications were predominantly seen in the Perth metropolitan area in the 1Q16. Of the cases with known Aboriginality status, most (89%) cases were non-Aboriginal. The median age was <1 year old (range <1 years to 87 years).

Table 4 Number of rotavirus notifications, 1st quarter 2016, WA, by region



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

\*\*Rotavirus: comparison to four years (2012-2015) of data only because laboratory testing and notification practices (increased use of more specific PCR over antigen testing) have changed since the beginning of 2012.

NA:not applicable as there is a 0 value in the calculation for the 1st quarter % change

## Other enteric diseases and foodborne illness

During the 1Q16, other enteric disease notifications included:

* **Shigellosis**: There were 29 shigellosis notifications in 1Q16 (see Table 5) that were culture positive, which was similar to the 1QM (n=26). *Shigella* *sonnei* was the most commonly notified species (24/29), with *S. sonnei* biotype g the most common subtype (10/24). Three cases of *S. flexneri,* one case of *S. boydii* and one unspeciated *Shigella* casewere notified in 1Q16. Of the notified cases, six (21%) were Aboriginal people and 22 (78%) were non-Aboriginal people. The place of acquisition of infection was reported for 72% (n=21), around half (n=12) of which were acquired overseas.
* **Hepatitis A infection:** Three hepatitis A cases were notified in 1Q16, with two cases acquiring their infection overseas in Indonesia and Ethiopia, respectively. The third case was a sailor in whom the overseas country of acquisition could not be determined.
* **Yersiniosis infection:** There were four cases of culture-positive yersiniosis notified in 1Q16, comprising 1 female and 3 males with an average age of 49 years (range 31 to 61 years). Two cases acquired their infection overseas.
* **Listeriosis:** One case was notified in 1Q16 in an elderly male. No immunocompromising conditions or immunosuppressive medications were identified. The case had consumed a number of high risk foods.
* **Paratyphoid fever**: Eight cases of *Salmonella* Paratyphi A were notified in 1Q16, comprising six males and two females, aged 5 to 61 years. All acquired the infection overseas, seven cases in India (including a cluster of three cases who attended the same function) and one in Bangladesh (Section 4).
* **Shiga toxin *E. coli* (STEC):** Six cases were notified in 1Q16, comprising three males and three females, ranging in age from 11-69 years. Cases appeared to be sporadic as no common venues or foods were identified.
* **Typhoid fever:** Two cases were notified in this quarter; in adult travellers to Indonesia and India, respectively.
* ***Vibrio parahaemolyticus*:** There were 12 *V. parahaemolyticus* notifications in 1Q16, 186% greater than the five-year mean (n=4). Seven cases were locally-acquired (two males and five females with an average age of 40, range 10 to 65 years) and an outbreak of locally acquired infectionassociated with consumption of oysters was investigated (Section 3). Five cases were acquired overseas (three males and 2 females with an average age of 48, range 40 to 54 years), in Thailand, Philippines, Vietnam, China and Indonesia, respectively.

There were no notifications forbotulism, cholera, haemolytic uraemic syndrome or hepatitis E in this quarter.

Table 5 Summary of number of notified cases of enteric notifiable diseases in WA in the first quarter 2016 compared to historical means



**\*** Rotavirus first quarter change compared to the four year mean 2012-2015 as previously described in Section 2.4.

NA:not applicable as there is a 0 value in the calculation for the 1st quarter % change

# Foodborne and suspected foodborne disease outbreaks

There were nine foodborne outbreaks investigated in this quarter. This is the highest number of foodborne outbreaks investigated in a quarter in WA.

## Oysters, *Vibrio parahaemolyticus* (outbreak code 050-2016-001)

There were nine cases of locally-acquired *V. parahaemolyticus* infection in WA (n=5), South Australia (n=1) and Queensland (n=3) with onsets from 13th to 26th March. Eight cases were interviewed. All had consumed raw oysters between 11th and 25th March from different food businesses that sourced the oysters from the same interstate jurisdiction. The cases comprised of six females and two males with a median age of 56.5 (range 28-88 years). The median incubation period was 1 day (range 1-2 days). Symptoms included diarrhoea (8/8), watery diarrhoea (5/5), abdominal pain (6/7), lethargy (6/7), nausea (5/8), headache (4/8), vomiting (3/8), fever (2/7), and bloody diarrhoea (1/6), with symptoms lasting a median of 7 days (range 5-10 days). No cases were hospitalised. The mode of transmission was foodborne.

Oyster samples collected in mid-April from five leases covering the two implicated interstate growing regions were negative for *V. parahaemolyticus*. It was noted that the temperature at the time of sample collection was a degree lower than previous measurements when the contamination event may have occurred.

## Pork roll outbreak, *Salmonella* Typhimurium (outbreak code 042-2015-011)

Following a luncheon at a church in mid-December, at least 12 of 100 people became ill and four people were diagnosed with *Salmonella* Typhimurium PFGE 0001, MLVA 03-25-16-11-523. Detailed information on symptoms was reported for nine cases and symptoms included diarrhoea (100%), fever (78%) and vomiting (66%), with an average incubation period of two days. Two people were hospitalised. Average duration of diarrhoea was five days. Food eaten at the luncheon consisted of Vietnamese pork rolls prepared by members of the church. The bread rolls contained chicken liver pate, barbeque pork, raw egg mayonnaise, pickled carrot and cucumber, coriander and spring onions. The outbreak was difficult to investigate as there was little cooperation by participants and no environmental investigation was conducted.

## Religious festival outbreak, *Salmonella* Typhimurium (outbreak code 042-2016-001)

In January an outbreak of gastroenteritis was reported in people who had attended a religious festival in a regional town. This was a community event with no set menu or attendance list and therefore a formal study was not undertaken. Of approximately 100 people who attended, five reported illness and three were confirmed as having *Salmonella* Typhimurium MLVA 03-12-12-11-523, PFGE 0039. This MLVA pattern had not previously been seen in WA. Community members brought food to share for lunch, which included biryani rice, sambal, sticky rice, watermelon and oranges. The source of the outbreak was unknown.

## Dinner party, *Salmonella* Typhimurium (outbreak code 042-2016-002)

Following a private dinner party in early January, at least five of 11 people became ill and one person was diagnosed with *Salmonella* Typhimurium, MLVA 03-26-20-11-523 (analogous to PFGE 0001). Information was reported on five cases and symptoms included diarrhoea (n=5), vomiting (n=3), fever (n=3) and bloody diarrhoea (n=1), with an average incubation period of two days. Average duration of diarrhoea was 6.5 days. The meal consisted of a selection of cheeses, roast pork, cabbage salad, garden salad, chocolate cake and a tiramisu (prepared by the host) which contained raw eggs. The diagnosed case only ate the salads and the tiramisu. The eggs used in the tiramisu were likely to be free range eggs from one of two WA egg producers. Eggs from one of these producers were also implicated in outbreaks 042-2016-004, 042-2016-007 and 042-2016-009. No environmental investigation was conducted. The mode of transmission was suspected foodborne.

## Cruise ship outbreak, *Salmonella* Enteritidis (outbreak code 042-2016-003)

An outbreak of gastroenteritis that occurred on an international passenger ship undertaking a cruise in WA waters was investigated in March. At least 30/537 people who were on the cruise became ill, with a median duration of diarrhoea of 5 days and 10 cases hospitalised. Faecal specimens collected from 13 ill people were positive for *Salmonella* Enteritidis. Phage typing (PT) was performed on a subset of these isolates; all were PT 25 var 1, which has historically been associated with South-East Asia. An analytical study found a statistical association between illness and drinking “smoothies” (OR 6.5, 95%CI 1.5-26.9, p=0.010) or eating a fish dish (OR 7.2, 95%CI 1.3-39.9, p=0.024) during the cruise. There was no opportunity to inspect the ship or undertake environmental sampling as the ship had left port and the likely source and means of contamination could not be determined.

## Mousse cake outbreak, *Salmonella* Typhimurium (outbreak code 042-2016-004)

In February 2016, there were eight cases (confirmed) of *Salmonella* Typhimurium MLVA 03-25-19-11-523 (analogous to PFGE 0001) and three cases (suspected) of gastroenteritis who had eaten chocolate mousse cake during their incubation period. The cases were seriously ill with 3/11 experiencing bloody diarrhoea and four being hospitalised. The average incubation period from eating the cake to becoming ill was one day.

The 11 cases were from five separate groups who had independently eaten chocolate mousse cake purchased from either one café or two supermarkets. The cakes eaten were the same brand and traced back to a WA commercial bakery. Cake sampled from a supermarket was positive for the same MLVA type of *Salmonella*. The environmental investigation found that raw egg whites were used to make the chocolate mousse for the cake; this practice has subsequently ceased. There were also a number of other non-compliances noted under the Australia New Zealand Food Standards Code. The eggs used by the bakery were from a WA egg producer whose eggs were also implicated in outbreaks 042-2016-002, 042-2016-007 and 042-2016-009.

## Café outbreak, Salmonella Typhimurium (outbreak code 042-2016-005)

There were two cases of *Salmonella* Typhimurium MLVA 03-25-19-11-523 (analogous to PFGE 0001) who had visited a café in common during their incubation period. They had visited the café on 3/3/2016 and 7/3/2016 with respective incubation periods of six and one days. Symptoms included diarrhoea (100%), fever (100%) and vomiting (50%). One case was hospitalised and duration of diarrhoea was 5-10 days. At the café, one case had eggs benedict and the other case had scrambled eggs, tomatoes, spinach and toast. Eggs were reportedly from a non-Western Australian egg producer. The environmental investigation found satisfactory food handling and hand hygiene practices. The mode of transmission was suspected foodborne.

## Restaurant outbreak, *Salmonella* Typhimurium (outbreak code 042-2016-007)

There were five people who had gastroenteritis (3 diagnosed with *Salmonella* Typhimurium, MLVA 03-25-19-11-523, analogous to PFGE 0001) after visiting a restaurant in common during their incubation period. The five cases were in three separate groups who visited the restaurant between 29/1/2016 to 7/2/2016, with a median incubation period of one day. Symptoms included diarrhoea (100%), fever (100%) and vomiting (60%). One case was hospitalised and the median duration of diarrhoea was 7 days. Cases ate a range of dishes including pancakes, fried rice and beef dishes and no specific food was implicated. The eggs used by the restaurant were from a WA egg producer whose eggs were also implicated in outbreaks 042-2016-002, 042-2016-004 and 042-2016-009. None of the cases reported eating raw or undercooked eggs at the restaurant. The environmental investigation conducted by local government found the food business was overall compliant with only minor issues noted. The mode of transmission was suspected foodborne.

## Dinner party, *Salmonella* Typhimurium (Outbreak code 042-2016-009)

Eight of 11 people from an extended family group became ill with gastroenteritis after attending a private dinner party in early February. Four of these ill people were diagnosed with *Salmonella* Typhimurium MLVA 03-25-18-11-523 (analogous to PFGE 0001). The median incubation period was two days and symptoms included diarrhoea (100%), fever (75%), vomiting (63%) and bloody diarrhoea (13%). None of the cases were hospitalised. The median duration of diarrhoea was 8 days. Food at the dinner included san choi bao, roast duck, spring rolls, vegetarian curry and fried rice, and tiramisu and Turkish delight desserts. There was a statistical association between becoming ill and eating the tiramisu (p=0.028), which was made using raw eggs from one of two WA free range egg producers. Eggs from one of these producers were also implicated in outbreaks 042-2016-002, 042-2016-004 and 042-2016-007. No environmental investigation was conducted. The evidence suggests that illness was due to foodborne transmission.

# Cluster investigations

There was one ongoing and four new cluster investigations during the first quarter of 2016.

## *Salmonella* Typhimurium PFGE 0001, PT 9

Since late 2013, there has been an ongoing community-wide increase in WA of notifications of MLVA types also characterised as STM PFGE 0001 (Figure 2). There were 172 cases of PFGE 0001 infection notified with ODOO in the 1st quarter of 2016 and of these, 17 cases were part of six point source outbreaks (see Section 3). The remaining 155 cases, comprising 51% males and 49% females, ranged in age from <1 to 87 years (average 29 years), and most (88%) resided in the Perth metropolitan area.

Retail chicken meat sampled in September 2014 was positive for PFGE 0001. Additionally, an egg sample in May 2015 from WA “egg producer A” was positive for PFGE 0001 and eggs from this producer were implicated in a foodborne outbreak associated with a café in the same time period (see 2015 2nd quarter report, outbreak 042-2015-003). Environmental samples taken in June 2015 at WA “egg producer A” were negative for *Salmonella*. In addition, an egg sample in October 2015 and three chicken meat samples in March 2016 from WA “egg producer B” were positive for PFGE 0001. Eggs from this same WA egg producer were implicated in four of the six outbreaks in the 1st quarter 2016. At the time of writing, no environmental samples have been taken from WA “egg producer B”. Previous interviews of non-point source outbreak cases support the hypothesis that the cause of illness was consumption of free range eggs and/or chicken meat. From the 25/2/2015 onwards, non-point source outbreak cases have been investigated as part of a case-control study of STM PFGE 0001 illness. Investigations are ongoing.

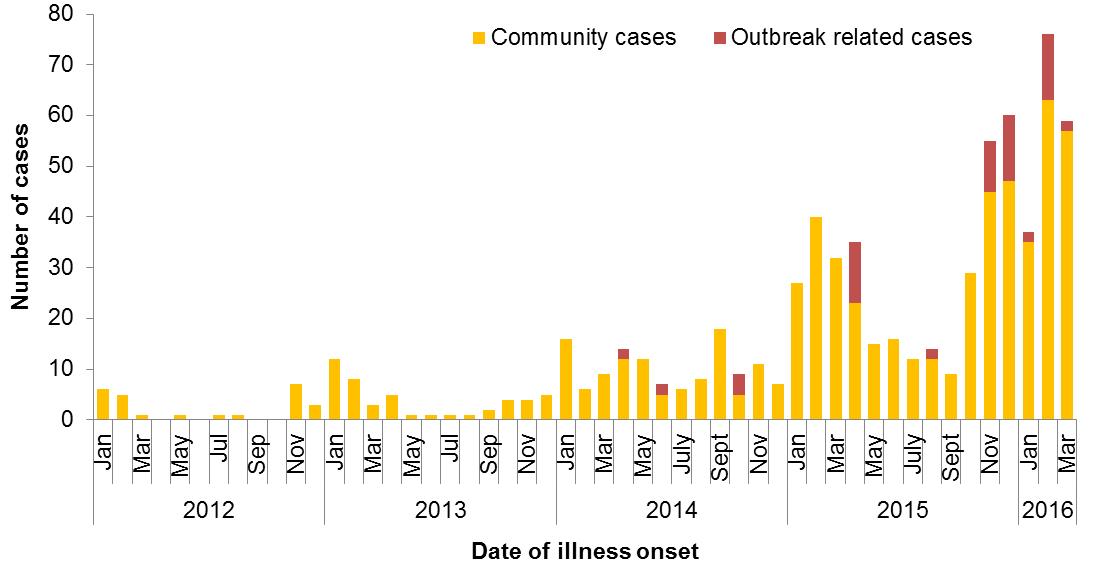


Figure 2 Notifications of *Salmonella* Typhimurium PFGE 0001 in WA, May 2013 to March 2016

## 4.2 *Salmonella* Eastbourne

An increase in *S.* Eastbourne was identified, with 11 cases reported in November (n=3) and December (n=4) 2015 and January 2016 (n=4). The historical five year average for the same period is two cases. Two cases were hospitalised. For the 11 cases, the average age was 42 years (range 1 to 87 years), with 36% male and 64% female. Seven cases resided in metropolitan Perth, two in the Wheatbelt region, one in the Great Southern region and one in Victoria. Five of 10 cases had recently travelled overseas (Bali = 3, Thailand = 1, South East Asia = 1). Three cases without recent travel were interviewed and no hypothesis for the cause of illness could be established.

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

An increase in STM MLVA 03-17-9-11-523 was identified, with six cases reported in January. The historical monthly average for the previous year was one case. One case was hospitalised. The average age was 23 years (range 2 to 64 years), with 50% male and 50% female. All cases lived in metropolitan Perth. Five cases were interviewed and no hypothesis for the cause of illness could be established.

## 4.4 *Salmonella* Kiambu

An increase in *S.* Kiambu was identified, with four cases reported in January. The historical five year average for the same period is one case. One case was hospitalised. The average age was 43 years (range 13 to 71 years), with 50% male and 50% female. All cases resided in metropolitan Perth. Three cases were interviewed and no hypothesis for the cause of illness could be established.

## 4.5 *Salmonella* Paratyphi A

There were three cases of *Salmonella* Paratyphoid phage type 13 infection amongst travellers returning from a wedding in India held in January 2016. Date of onset was complicated by co-infection with *Shigella* in two cases who were siblings (one culture-positive for *Shigella sonnei*, one *Shigella* PCR-positive only). The third case had severe diarrhoea treated in India before presenting with symptoms of paratyphoid fever upon return. The cases had returned to Australia for a median of 4 days (range 2 to 32 days) before onset; one case had also visited Kenya for 12 days before returning. Onset was a median 21 days (range 17-35 days) after the wedding. The three cases included two males and one female and had an average age of 42 years. Two cases were hospitalised. The evidence suggests that cases acquired their illness in India but it unclear if the exposure was at the wedding.

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

There were 31 outbreaks of enteric disease in this quarter that appeared to be non-foodborne (see Table 6). Of these, 26 outbreaks were ascribed to person-to-person transmission and five outbreaks had an unknown mode of transmission.

Table 6 Outbreaks with non-foodborne transmission, 1st Quarter 2016, WA



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

## Person-to-person outbreaks

In the 26 non-foodborne outbreaks that were suspected to be due to person-to-person transmission, 18 (69%) outbreaks occurred in RCFs, five (19%) were in child care centres and one each in a hospital, a mental health facility and on a bus tour. The causative agent for 12 (46%) outbreaks was confirmed as norovirus, while one outbreak was confirmed as adenovirus. The remaining 13 (50%) outbreaks were of unknown aetiology as specimens were either not collected (n=8) or were negative for common viral and bacterial pathogens (n=5).

A total of 371 people were affected in these 26 outbreaks, with six reported hospitalisations and one associated death. The number of person-to-person outbreaks in the 1Q16 was 17% lower than the 1QM (n=31).

## Outbreaks with unknown mode of transmission

There were five outbreaks in this quarter with an undetermined mode of transmission, with 136 people ill and no hospitalisations or deaths. Two of these outbreaks were in RCFs and one was in a hospital, where the most common symptom reported was diarrhoea, and vomiting was reported infrequently, which is not typical of norovirus outbreaks in care settings. In these three outbreaks stool specimens were collected and tested, but were negative for common bacterial and viral pathogens.

The fourth outbreak followed a toddler birthday party in January, with reports of gastroenteritis among attendees. Of the 40 attendees (20 children and 20 adults) approximately 15 (5 children, 10 adults) became ill. No stool samples were tested. Individual information was only available for three adults and symptoms included diarrhoea (n=2) and vomiting (n=2), with symptoms lasting 2 days. The party toddler vomited four days before the party, with one day duration of illness. Purchased food included sausage rolls, quiche, smoked salmon, cheeses, olives; and home-made food included sandwiches and cakes. Most ill people had not met prior to attending the party. The mode of transmission of the (most likely viral) pathogen was unknown.

The fifth outbreak occurred on a cruise ship, with 102 people ill with diarrhoea and/or vomiting. Specimens tested at an overseas laboratory were negative for common bacterial, viral and parasitic pathogens. The epidemic curve was not characteristic of a person to person outbreak. No epidemiological investigation was conducted as the outbreak took place outside of WA waters.

# Site activities

During the first quarter of 2016, 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 nine foodborne outbreaks.
* Investigation and monitoring of 26 person-to-person gastroenteritis outbreaks and five outbreaks with unknown mode of transmission.
* Ongoing investigation of a community-wide increase in *Salmonella* Typhimurium PFGE type 0001 and four other cluster investigations.
* Responded to national OzFoodNet enteric disease surveillance requests.
* Attended the national OzFoodNet face to face meeting in Hobart in February, which included a presentation on the “Locally acquired hepatitis A outbreak in WA associated with consumption of frozen imported berries”.
* Interviewing *Salmonella* Enteritidis cases regarding travel status and attempting to identify risk factors in locally acquired cases.
* Release of the revised operational directive ‘Guidelines for exclusion of people with enteric infections and their contacts from work, school and child care settings’.
* Together with the Food Unit, conducted training for environmental health officers and public health nurses in Kalgoorlie in February. Positive feedback from evaluation.
* Co-authored a publication in Foodborne Pathogens and Disease entitled ‘*Salmonella* Typhimurium and Outbreaks of Egg-Associated Disease in Australia, 2001 to 2011’.
* Membership of OzFoodNet working groups on:
  + Outbreak register
  + Foodborne disease tool kit
  + Egg-related outbreaks
  + Culture-independent testing
* Participation in monthly national OzFoodNet teleconferences.

# 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].

This document can be made available in alternative formats on request for a person with a disability.

© Department of Health 2016