Quarterly report

OzFoodNet enhanced foodborne disease surveillance, 1 January to 31 March 2013

The OzFoodNet Working Group

Introduction

The Australian Government Department of Health established the OzFoodNet network in 2000 to collaborate nationally to investigate foodborne disease. In each Australian state and territory, OzFoodNet epidemiologists investigate outbreaks of enteric infection. OzFoodNet conducts studies on the burden of illness and coordinates national investigations into outbreaks of foodborne disease. This quarterly report documents investigations of outbreaks of gastrointestinal illness and clusters of disease potentially related to food, which occurred in Australia between 1 January and 31 March 2013.

Data were received from OzFoodNet epidemiologists in all Australian states and territories. The data in this report are provisional and subject to change, as the results of outbreak investigations can take some months to finalise.

During the 1st quarter of 2013, OzFoodNet sites reported 522 outbreaks of enteric illness, including those transmitted by contaminated food. Outbreaks of gastroenteritis are often not reported to health agencies or the reports may be delayed, meaning that these figures under-represent the true burden of enteric disease outbreaks. In total, these outbreaks affected 8,378 people, of whom 221 were hospitalised. There were 20 deaths reported during these outbreaks. The majority of outbreaks (74%, n=385) were due to person-to-person transmission (Table 1), with 50% (194/385) of these occurring in aged care facilities.

Foodborne and suspected foodborne disease outbreaks

There were 34 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as being the primary mode of transmission (Table 2). These outbreaks affected 347 people and resulted in 36 hospitalisations. There were no deaths reported during these outbreaks. This compares with 37 outbreaks during the 4th quarter of 2012[1] and a 5-year mean of 39 outbreaks for the 1st quarter between 2008 and 2012.

Table 1: Outbreaks and clusters of gastrointestinal illness reported by OzFoodNet, Australia, 1 January to 31 March 2013, by mode of transmission

Transmission mode	Number of outbreaks and clusters	Per cent of total
Foodborne and suspected foodborne	34	6.5
Waterborne and suspected waterborne	17	3.3
Person-to-person	385	73.8
Animal-to-person	1	<1
Unknown (*Salmonella* cluster)	19	3.6
Unknown (*Listeria* cluster)	1	<1
Unknown (other pathogen cluster)	3	0.6
Unknown	62	11.9
Total	522	100.0*

* Percentages do not add up due to rounding.

A limitation of the outbreak data provided by OzFoodNet sites for quarterly reports is the potential for variation in the categorisation of the features of outbreaks depending on circumstances and investigator interpretation. Changes in the number of foodborne outbreaks should be interpreted with caution due to the small number each quarter.

Salmonella was the aetiological agent for 17 (50%) outbreaks this quarter, with *Salmonella* Typhimurium being the most common serotype (n=13). Of the remaining outbreaks, 4 (12%) were due to norovirus and 1 (3%) each due to *Campylobacter jejuni*, ciguatera fish poisoning, *Shigella sonneii* biotype a, *Staphylococcus aureus*, and a suspected bacterial toxin. In 8 (24%) outbreaks, the aetiological agent was unknown.

There were 16 outbreaks (47% of foodborne or suspected foodborne outbreaks) reported in this quarter associated with food prepared in restaurants (Table 3).

Table 2: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet sites, 1 January to 31 March 2013 (n=34)

State or territory	Month*	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
ACT	Jan	Private residence	*Salmonella* Typhimurium PT 44 / MLVA) profile 03-11-07-11-523	10	0	D	Unknown
ACT	Feb	Private residence	Suspected bacterial toxin	6	0	D	Assorted chicken, beef and bean dishes with rice
NSW	Jan	Private residence	*S.* Typhimurium MLVA profile 03-27-08-21-496	8	2	D	Unknown
NSW	Jan	Restaurant	*S.* Cerro	3	1	D	Unknown
NSW	Jan	Restaurant	*S.* Typhimurium	5	0	D	Unknown
NSW	Jan	Restaurant	Norovirus	3	0	D	Salad
NSW	Jan	Takeaway	*S.* Typhimurium	3	3	D	Unknown
NSW	Jan	Takeaway	Unknown	3	0	D	Chicken burger
NSW	Feb	Private residence	*S.* Birkenhead	12	3	D	Unknown
NSW	Feb	Restaurant	*S.* Typhimurium MLVA profile 03-09-07/08-14-523	7	3	M	Fried ice cream with raw egg
NSW	Feb	Restaurant	Unknown	4	0	D	Beef taco
NSW	Feb	Takeaway	Unknown	2	0	D	Unknown
NSW	Mar	Private residence	*S.* Typhimurium MLVA profile 03-17-09-12-523	4	4	D	Raw egg smoothies
NT	Feb	Private residence	*S.* Typhimurium PT 9	4	2	D	Caesar salad dressing containing raw egg
NT	Mar	Private residence	*Shigella sonnei* biotype a	5	1	D	Curried meat (unknown type of meat)
Qld	Jan	Restaurant	*S.* Typhimurium MLVA profile 03-25-16-11-524	3	1	D	Duck liver paté
Qld	Jan	Restaurant	*Staphylococcus aureus*	8	0	M	Chicken sushi
Qld	Feb	National franchised fast food	Unknown	3	0	D	Pizza
Qld	Mar	Primary produce	Ciguatera fish poisoning	4	Unknown	D	Red coral trout
SA	Mar	Restaurant	Norovirus	14	1	D	Unknown
SA	Mar	Restaurant	*Salmonella* Typhimurium PT 9 MLVA profile of 03-15-06-11-550	9	1	D	Eggs
Tas.	Jan	Restaurant	*S.* Mississippi	36	2	D	Suspected salad
Vic.	Jan	Commercial caterer	Unknown	32	1	A	Sandwiches
Vic.	Jan	Correctional facility	*S.* Typhimurium PT 135	3	1	D	Raw egg drink
Vic.	Jan	Private residence	*S.* Typhimurium PT 135a	10	1	D	Tiramisu containing raw eggs
Vic.	Jan	Restaurant	Norovirus	6	0	D	Infectious food handler
Vic.	Jan	Restaurant	Norovirus	7	0	D	Salad

Table 2 *continued*: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet sites, 1 January to 31 March 2013 (n=34)

State or territory	Month*	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
Vic.	Feb	Aged care facility	Unknown	9	0	D	Unknown
Vic.	Feb	Bakery	*S.* Infantis	21	5	D	Pork rolls
Vic.	Feb	Restaurant	*Campylobacter jejuni*	2	1	D	Variety of Chinese dishes
Vic.	Mar	Commercial caterer	Unknown	35	0	D	Unknown
Vic.	Mar	Restaurant	*S.* Typhimurium PT 44	22	2	A	Scrambled eggs
WA	Feb	Restaurant	Unknown	39	1	A	Duck pancakes
WA	Mar	Restaurant	*S.* Typhimurium PFGE profile 151	5	0	D	Unknown
Total				347	36		

* Month of outbreak is the month of onset of first case or month of notification/investigation of the outbreak.

A Analytical epidemiological association between illness and 1 or more foods.

D Descriptive evidence implicating the suspected vehicle or suggesting foodborne transmission.

M Microbiological confirmation of agent in the suspected vehicle and cases.

MLVA Multi-locus variable number tandem repeat analysis.

PFGE Pulsed-field gel electrophoresis.

PT Phage type.

Table 3: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet, 1 January to 31 March 2013, by food preparation setting

Food preparation setting	Outbreaks
Restaurant	16
Private residence	8
Takeaway	3
Commercial caterer	2
Aged care	1
Bakery	1
Correctional facility	1
National franchised fast food	1
Primary product	1
Total	34

To investigate these outbreaks, sites conducted 4 cohort studies, 3 case control studies and collected descriptive case series data for 23 investigations, while for 4 outbreaks, no individual patient data were collected. The evidence used to implicate food vehicles included analytical association between illness and food in 3 outbreaks and microbiological confirmation in 2 outbreaks. Descriptive evidence alone was obtained in 29 outbreak investigations.

The following jurisdictional summaries describe key outbreaks and public health actions that occurred during the quarter.

Australian Capital Territory

There were 2 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agents were identified as *Salmonella* Typhimurium phage type (PT) 44 multi-locus variable number tandem repeat analysis (MLVA) profile[*,2] 03-11-07-11-523 and a suspected bacterial toxin.

New South Wales

There were 11 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agent was identified in eight of these outbreaks: five were due to *S.* Typhimurium and one each due to norovirus, *S.* Birkenhead and *S.* Cerro.

Description of key outbreaks

Ten people from 3 groups ate at a restaurant and seven of the ten subsequently became ill with gastrointestinal illness. All seven developed illness had consumed fried ice cream. All cases had stool samples that tested positive for *S.* Typhimurium MLVA profile 03-09-07-14-523 or 03-09-08-14-523. The New South Wales Food Authority (NSWFA) inspected the restaurant and took 5 samples of frozen and cooked fried ice cream balls that were made subsequent to the visits by the salmonellosis cases. All 5 sampled fried ice cream balls tested positive for *S.* Typhimurium MLVA profile 03-09-07-14-523 or 03-09-08-14-523. The restaurant proprietor was advised to only make fried ice cream using a pasteurised egg product. The NSWFA also inspected the egg farm that supplied the restaurant and found *Salmonella* with the same MLVA profile on an egg rinse sample. The egg farm was instructed to complete a clean-up of operations.

A cluster of 3 cases of an unusual *S.* Typhimurium MLVA profile (03-27-08-21-496) was investigated in January 2013. The cases occurred in December 2012 and were members of the same social club who had shared a dinner organised for 52 attending members. Further interviews found that eight of the members had gastroenteritis symptoms with two of those requiring admission to hospital. The group ate a menu of chicken and corn soup, roast chicken, potato salad, coleslaw, commercial frozen cheesecake, lemon meringue pie and trifle. The items were prepared in members' homes or bought from a grocery store. The group was not willing to provide further information about specific foods consumed and the exact cause remains unknown.

In January, investigators were notified of gastrointestinal illness in 3 people from a group of five that had shared a meal at a hotel restaurant. This was the only shared exposure for the group with no contact between their 4 different households or contact with ill people in the week prior to the meal. Symptoms included nausea, vomiting, abdominal cramping and diarrhoea with one or more of joint or muscle pain, headache and lethargy. The median incubation period was approximately 25 hours with a duration of 3 days. Foods consumed included chicken schnitzel and salad. The NSWFA conducted an inspection of the premises and identified food handlers and staff who had been unwell with symptoms of vomiting and had returned to work before the recommended 48 hour exclusion period. One clinical sample obtained from a case was positive for norovirus by polymerase chain reaction. A verbal warning was given to the hotel restaurant.

Investigators were notified of a cluster of *S.* Typhimurium MLVA profile 03-17-09-12-523, after a family of four was hospitalised. The only common high risk food consumed was banana smoothie made with milk and raw eggs. The eggs

* MLVA profiles are reported using the Australian coding convention agreed at a MLVA typing harmonisation meeting in Sydney in November 2011.

were from a small free-range egg farm. The family was provided with information about salmonellosis and the risks associated with consuming raw eggs.

Northern Territory

There were 2 reported outbreaks of foodborne illness during the quarter. The aetiological agents were identified as *S.* Typhimurium PT 9 and *Shigella sonnei* biotype a.

Description of key outbreaks

A mother and a 4-day-old neonate were notified with *S.* Typhimurium PT 9 positive stool cultures. The mother ate a home prepared Caesar salad with a raw egg dressing 1 day prior to the onset of symptoms. A day later she was admitted to hospital with diarrhoea and vomiting and gave birth the following day. The neonate's stool culture tested positive 4 days later for *S.* Typhimurium PT 9. Routine follow-up revealed 2 other family members had symptoms of gastroenteritis and had also consumed the Caesar salad. The salad was refrigerated after initial preparation and eaten over a period of 3 days, which resulted in staggered onset dates for the adults. No leftover food was available for testing.

An outbreak of diarrhoea affecting 5 people was attributed to consumption of a contaminated meal of unknown curried meat. Three people experienced symptoms of abdominal cramps and diarrhoea following the meal. Two of these people provided stool samples, which tested positive for *Shigella sonneii* biotype a. Routine follow-up of cases revealed that the meal had been prepared by an elderly woman with diarrhoea whose grandson also had diarrhoea.

Queensland

There were 4 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agent was identified in three of these outbreaks: one each due to *S.* Typhimurium, *Staphylococcus aureus* and ciguatera fish poisoning.

Description of key outbreaks

Eight cases of gastrointestinal illness were linked to the consumption of chicken sushi rolls, purchased from the same sushi venue in January. The outbreak was initially identified among 4 attendees of a birthday party held at a children's play café. Sushi rolls from the venue were included in the birthday party menu. Investigations identified further cases within the community who had not attended the party, but who had consumed sushi meals from the same establishment. Symptoms experienced by the cases included vomiting, diarrhoea and stomach cramps with onsets of illness approximately 1 to 3.5 hours after consuming the sushi (median incubation period 2.8 hours). Environmental swabs and food samples (including beef or chicken sushi, tuna, pork buns, rice and chicken) were collected for microbiological testing. A moderate to heavy growth of coagulase positive staphylococci were detected in 3 of 4 faecal specimens with 1 specimen positive for staphylococcal enterotoxin. Coagulase positive staphylococci (2×10^7 cfu/g) and staphylococcal enterotoxin were detected in 1 sample of teriyaki chicken, while *Bacillus cereus* ($>10^4$ cfu/g) was detected in beef and teriyaki chicken samples. Environmental investigations identified numerous time-temperature issues on site as well as poor food handling practices. The license of this food establishment was suspended until these issues were rectified.

Three cases of *S.* Typhimurium with the same MLVA profile (03-25-16-11-524) were notified in January. Investigations identified that the cases were from 2 separate groups of diners who had reported attending the same restaurant on the same night. Onset of symptoms ranged from 20 to 36 hours following their respective meals with 1 case hospitalised overnight due to their illness. The consumption of duck liver paté was common to all 3 cases. While no duck liver paté was available for microbiological testing, undercooked duck liver paté was the likely contributing factor for this outbreak. Restaurant management voluntarily removed this item from the menu following identification of this outbreak.

South Australia

There were 2 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agents were identified as *S.* Typhimurium PT 9 and norovirus.

Description of key outbreak

Investigators were notified of an outbreak of *S.* Typhimurium PT 9 associated with a restaurant in March. Nine people who consequently had gastrointestinal illness dined at the restaurant on the same day. Seven of the cases submitted faecal samples; all were confirmed as *S.* Typhimurium PT 9 with the MLVA profile 03-15-06-11-550. Through hypothesis generating interviews, it was found that all cases had consumed or tasted poached eggs and hollandaise sauce. An environmental investigation was conducted that identified the use of raw eggs in the hollandaise sauce, temperature abuse of eggs and the need for improvements in food handling as contributing factors. The restaurant kitchen has since been refurbished.

Tasmania

There was 1 reported outbreak of foodborne illness during the quarter. The aetiological agent was identified as *S.* Mississippi.

Description of outbreak

Investigators identified an outbreak of *S.* Mississippi associated with eating at a hotel restaurant over a 3-day period in December 2012. This outbreak was identified in early January through routine follow-up of salmonellosis cases. There were 11 confirmed cases and an estimated 25 suspected cases. Symptoms reported by confirmed cases were diarrhoea (100%), vomiting (50%), fever (50%) and abdominal pain (80%). The median incubation time was 30 hours. Of the 11 confirmed cases identified, all had consumed the salad that was served with the main meals in the exposure period. Two food handlers had reported illness and been excluded from work around the time of the outbreak. These food handlers did not have faecal samples collected at the time of illness.

A retrospective cohort study was performed utilising data collected from 19 cases that had been identified during the investigation and the co-diners of these cases. The salad was the only meal with a statistical association with illness (risk ratio (RR) undefined, $P=0.0007$). There were limitations to the study as cases were not reinterviewed with a specific questionnaire detailing all the individual specific exposures at the restaurant and several co-diners were not interviewed directly and their exposure information was relayed by their contacts (the confirmed cases). Due to these limitations, the findings of the study undertaken have to be interpreted with caution.

Victoria

There were 10 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agent was identified for seven of these outbreaks: three were due to *S.* Typhimurium; two were due to norovirus; and one each was due to *S.* Infantis and *Campylobacter jejuni*.

Description of key outbreaks

In January, investigators were notified of an outbreak of gastroenteritis amongst a group that attended a function catered by an off-site caterer. Of approximately 100 attendees, 61 were interviewed and 32 reported vomiting and/or diarrhoea with a median incubation period of 48 hours after eating morning tea. Six different types of sandwiches were served as well as scones with jam and cream and tea and coffee. Analysis of food exposures revealed that eating any food at the function had a statistically significant association with illness (odds ratio (OR) undefined; $P<0.0000$). Specifically, consumption of 1 of 2 different types of sandwiches (both containing ham and tomato) was statistically associated with illness. No faecal specimens were collected but the symptoms, duration and median incubation period were consistent with a viral pathogen as the cause.

In January, routine review of surveillance data identified an increase in cases of salmonellosis with residential addresses in 1 of 4 local government areas and a cluster investigation commenced. A day later the Microbiological Diagnostic Unit reported a cluster of cases of *S.* Infantis in this same geographical area. Initial case interviews identified the likely food source for this outbreak as being Vietnamese pork rolls, all purchased from the same bakery. Twenty-one cases (13 confirmed *S.* Infantis and 8 suspected cases) reported eating a variety of rolls from the bakery over a 7-day period. Egg butter made with raw eggs was consumed by the majority of cases. Shell eggs and raw chicken were sampled during the investigation, however, these were not from the same batch used during the outbreak period. *S.* Singapore was isolated from a rinse of the eggs and *S.* Infantis was isolated from the raw chicken. It is suspected that the outbreak was caused either by consumption of an ingredient of the pork roll that was cross contaminated by raw chicken or the egg butter.

In January, a *Salmonella* outbreak affecting 3 inmates of a prison was investigated. All had shared protein shakes containing raw eggs on multiple occasions during their incubation period. These drinks were prepared in a kitchenette and the eggs were not kept refrigerated. The eggs used in the drink were purchased from the canteen and not sourced from the main kitchen. *S.* Typhimurium PT 135a was isolated from the faecal specimens of 2 cases.

In January, an outbreak affecting 10 people who dined at a private residence was investigated. Sixteen people attended and 13 of these were interviewed. Eight people reported an onset of gastroenteritis with a median incubation period of 20.5 hours after eating the meal. An additional 2 cases were children of one of the cases. They were suspected to have been secondary cases as their onsets were 5 and 10 days after the dinner. A cohort analysis did not show an association with consumption of any of the foods and illness. It is suspected that the outbreak was caused by consumption of tiramisu which contained raw eggs, as this was the only food consumed by all of the cases.

Three people who consumed the tiramisu did not report any symptoms. *S.* Typhimurium PT 135a was isolated from the faecal specimens of 5 cases.

In March, a case of salmonellosis was notified by a general practitioner who reported that one of his patients had become unwell after attending a golf breakfast. His patient reported that a number of other attendees at this function had also become unwell. Investigation revealed that the case ate with a group of 31 golfers. Food served to the group was limited to scrambled eggs, bacon, mushrooms, tomatoes, bread and fruit. A retrospective cohort study was conducted, with 30 questionnaires completed. Twenty-two attendees reported having an onset of diarrhoea with a median incubation period of 22 hours from the breakfast meal. Nine cases had *S.* Typhimurium PT 44 isolated from their faecal specimen. Analysis of food exposures revealed a statistically significant association with consumption of scrambled eggs and illness (RR undefined, $P=0.0004$). Since 2007, *S.* Typhimurium PT 44 has been responsible for multiple outbreaks associated with consumption of raw or undercooked eggs in Victoria.

Western Australia

There were 2 reported outbreaks of foodborne or suspected foodborne illness during the quarter. *S.* Typhimurium was identified as the aetiological agent for one of the outbreaks.

Description of key outbreaks

At least 39 people became ill following a function held at a restaurant in February, with a median incubation period of 32.5 hours and duration of 1.3 days. The incubation period, duration of illness and symptoms suggested that the infectious agent was likely to be a virus such as norovirus. The 1 faecal specimen collected from an ill person was negative for common bacterial pathogens, but was not tested for viruses. In univariate analyses, illness was statistically associated with consumption of the Peking duck pancake (OR 56, 95% CI 7.8—undefined, $P=<0.0001$). The environmental investigation found that there was no documented temperature control for foods stored or received, that duck had been transported from the supplier without temperature control, and that the supplier inappropriately stored the duck in their cool room. Whilst there were potential food safety risks from these food handling, storage and transportation issues, these were not likely to be the cause of this outbreak. No staff illness was reported at the time of the outbreak at the restaurant or the supplier of the duck. It was concluded that the Peking duck pancake was the most likely food contaminated with a viral like pathogen but the means of contamination of the pancake was not identified.

Two cases with *S.* Typhimurium pulsed field gel electrophoresis (PFGE) type 151 ate independently at a restaurant on the same day in March. This is a rare *S.* Typhimurium PFGE type in Western Australia, with only 7 cases previously reported. Three other people who dined with these guests were also ill. Cases fell ill within 24 hours of the meal, but could not detail specific menu items eaten when interviewed. The local government area environmental health officer investigated the food business and found it had adequate food storage and handling and no staff reported illness. The cause of this suspected foodborne outbreak was not determined.

Multi-jurisdictional investigation

A previously reported multi-jurisdictional outbreak investigation of listeriosis (PFGE type 119A:44A:1) associated with the consumption of brie and/or camembert cheese[1] continued this quarter.

Cluster investigations

During the quarter, OzFoodNet sites investigated a number of clusters of infection for which no common food vehicle or source of infection could be identified. Aetiological agents identified during these investigations included: *S.* Typhimurium, *Cryptosporidium, Listeria monocytogenes* and Shiga toxin-producing *Escherichia coli*.

In January, an investigation commenced in New South Wales into a cluster of *S.* Wangata as part of an ongoing investigation to identify the source of this *Salmonella* serovar. Twenty-two cases were notified over a 2 month period. Cases had a median age of 42 years (range 1—81) and 50% were female. Place of residence included Hunter New England (6), North Coast (8), Northern Sydney Central Coast (3), South East Sydney (3), Sydney South West (1) and Greater Western (1). Seventeen cases were interviewed. Exposures of greatest interest included close proximity to rivers/creeks (65%), lizards (53%) and dogs (40%). The investigation is ongoing.

Comments

The majority of reported outbreaks of gastrointestinal illness in Australia are due to person-to-person transmission, and in this quarter, 74% of outbreaks (n=385) were transmitted via this route. The number of foodborne outbreaks this quarter

(n=34) is similar to the previous quarter (n=37) and to the 5-year mean of 39 outbreaks for the 1st quarter between 2008 and 2012.

Salmonella was identified as the aetiological agent in 50% of all foodborne or suspected foodborne outbreaks this quarter (17/34). *S.* Typhimurium was identified as the aetiological agent in 13 (38%) of the foodborne or suspected foodborne outbreaks (Table 2). Of the 17 outbreaks where *Salmonella* was implicated as the responsible agent, 47% (8/17) were associated with raw or undercooked egg products (raw egg dressings, butter and drinks and raw or undercooked egg meals and desserts).

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