

Quarterly reports

OzFoodNet QUARTERLY REPORT, 1 JULY TO 30 SEPTEMBER 2011

The OzFoodNet Working Group

The Australian Government Department of Health and Ageing 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, occurring in Australia from 1 July to 30 September 2011.

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 months to finalise.

During the third quarter of 2011, OzFoodNet sites reported 517 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 9,520 people, of whom 167 were hospitalised. There were 32 deaths reported during these outbreaks. The majority of outbreaks (81%, n=419) were due to person-to-person transmission (Table 1).

Foodborne and suspected foodborne disease outbreaks

There were 34 outbreaks during this quarter where consumption of contaminated food was suspected

or confirmed as the primary mode of transmission. These outbreaks affected 510 people, resulting in 13 hospitalisations and no deaths (Table 2).

Salmonella enterica was identified as the aetiological agent for 7 outbreaks during this quarter (1 *S. Saintpaul* and 6 *S. Typhimurium*). Of the remaining outbreaks, 5 (15%) were due to *Clostridium perfringens*, 3 (9%) were due to *Campylobacter*, 2 (6%) were due to ciguatera fish poisoning and 2 (6%) due to *Staphylococcus aureus*. One outbreak (3%) was due to norovirus, and 2 (6%) were due to mixed aetiological agents. There were 12 (35%) outbreaks where the aetiological agent remained unknown (Table 2).

Fifteen outbreaks (44% of foodborne outbreaks) reported in this quarter were associated with food prepared in restaurants, 5 outbreaks (15%) with food prepared by a commercial caterers, 4 outbreaks (11%) in private residences and 3 outbreaks (9%) in aged care facilities. The remaining 7 outbreaks (21%) were reported from a range of settings (Table 2).

To investigate these outbreaks, sites conducted 6 cohort studies, 2 case control studies and collected descriptive case series data for 18 investigations, while for 8 outbreaks no individual patient data were collected. As evidence for the implicated food vehicle, investigators collected both microbiological and analytical evidence for 1 outbreak, relied on microbiological evidence in 1 outbreak and analytical evidence alone in 5 outbreaks. Descriptive evidence was obtained in 27 outbreak investigations.

Table 1: Outbreaks and clusters of gastrointestinal illness reported by OzFoodNet, 1 July to 30 September 2011, by mode of transmission

Transmission mode	Number of outbreaks and clusters	Per cent of total
Foodborne and suspected foodborne	34	7
Person-to-person	419	81
Animal-to-person	1	<1
Unknown (<i>Salmonella</i> cluster)	12	2
Unknown (other)	51	10
Total	517	100

Table 2: Outbreaks of foodborne disease reported by OzFoodNet sites,* 1 July to 30 September 2011 (n=34)

State	Month	Setting prepared	Agent responsible	Number affected (n=510)	Hospitalised (n=13)	Evidence	Responsible vehicles
NSW	July	Restaurant	<i>S. Typhimurium</i> MLVA profile 3-9-8-14-523	13	1	D	Raw egg tiramisu
	July	Restaurant	Unknown	13	0	D	Unknown
	July	Restaurant	Unknown	2	0	D	Unknown
	July	Restaurant	Unknown	2	0	D	Unknown
	July	Takeaway	Unknown	3	1	D	Unknown
	August	Commercial caterer	Unknown	25	0	D	Unknown
	August	Restaurant	Unknown	11	0	D	Unknown
	August	Restaurant	<i>S. Typhimurium</i> MLVA profile 3-9-7-13-523	6	0	D	Raw egg dressing
	August	Restaurant	<i>S. Typhimurium</i> MLVA profile 3-9-7-15-523	3	0	D	Raw egg mayonnaise
	September	Commercial caterer	Unknown	87	0	A	Salad of poached prawns with Thai herbs
	September	Restaurant	Unknown	6	0	D	Madras chicken curry with rice
	September	Restaurant	Unknown	4	0	D	Unknown
	September	Restaurant	Unknown	3	0	D	Unknown
	September	Restaurant	<i>Campylobacter</i>	2	0	D	Unknown
	NT	September	Fair/festival/mobile service	<i>S. Saintpaul</i>	3	0	D
Qld	July	Private residence	Ciguatera fish poisoning	3	0	D	Reef fish (unknown species)
	July	Restaurant	<i>C. perfringens</i>	3	0	M	Chicken curry
	August	Primary produce	Ciguatera fish poisoning	3	0	D	Coral Trout
	September	Commercial caterer	<i>S. aureus</i>	38	1	AM	Fried rice; chicken; egg fu yung; mussels
	September	Hospital	<i>Campylobacter</i>	5	5	D	Unknown
SA	August	Institution-other	<i>Campylobacter</i>	9	0	A	Unknown
	August	Institution-other	<i>S. Typhimurium</i> PT 108 and <i>Campylobacter</i>	4	0	D	Unknown
Vic	July	Aged care	<i>C. perfringens</i>	11	1	D	Unknown
	July	Restaurant	Unknown	7	0	D	Beef rendang or pork satay
	July	Private residence	Unknown	7	0	D	Raw egg chocolate mousse
	August	Restaurant	<i>S. Typhimurium</i> PT 170	14	1	D	Raw egg chocolate mousse
	August	Aged care	<i>C. perfringens</i>	7	0	D	Unknown
	August	Private residence	<i>S. Typhimurium</i> PT 135	4	2	D	Suspected eggs

Table 2 continued: Outbreaks of foodborne disease reported by OzFoodNet sites, * 1 July to 30 September 2011 (n=34)

State	Month	Setting prepared	Agent responsible	Number affected (n=510)	Hospitalised (n=13)	Evidence	Responsible vehicles
Vic, cont'd	September	Reception centre	<i>C. perfringens</i>	41	0	A	Roast beef
	September	Commercial caterer	<i>S. aureus</i>	28	1	D	Mixed curry meal
	September	Aged care	<i>C. perfringens</i>	14	0	D	Suspected roast meats
	September	Private residence	<i>S. Typhimurium</i> PT 44	11	0	D	Raw egg tiramisu
WA	July	Restaurant	Norovirus	53	0	A	Salad
	September	Commercial caterer	<i>Campylobacter</i> , <i>S. Typhimurium</i> PFGE type 0007, <i>S. Infantis</i>	65	0	A	Duck parfait

* No foodborne outbreaks were reported by the Australian Capital Territory or Tasmania.

A Analytical epidemiological association between illness and one 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 of tandem repeat analysis

PFGE Pulsed-field gel electrophoresis

PT Phage type.

The following jurisdictional summaries describe key outbreaks and public health actions that occurred in this quarter.

New South Wales

There were 14 reported outbreaks of foodborne or suspected foodborne illness during the quarter.

An investigation of a complaint to the NSW Food Authority (NSWFA) identified illness in 3 restaurant patrons after consuming tiramisu (which included raw egg). One case submitted a specimen that was positive for *S. Typhimurium* multi-locus variable number of tandem repeats analysis (MLVA) profile 3-9-8-14-523. Interviews with other *S. Typhimurium* cases with the same MLVA profile identified 10 ill people who also consumed the tiramisu at this restaurant. A further 6 submitted stool specimens were positive for *S. Typhimurium*, all with the same MLVA profile. The NSWFA inspected the premises with the only food safety issue being the use of raw eggs to make tiramisu. The business agreed to use pasteurised egg product as an alternative.

Six cases of *S. Typhimurium* MLVA profile 3-9-7-13-523 infection were notified in the Newcastle area. These cases represented 3 separate groups that ate at a bakery, with 5 of 6 cases consuming a carrot salad (which contained raw egg), amongst other foods. Food and environmental samples from the bakery were negative for bacterial pathogens. Environmental samples taken during an investigation at the egg farm supplying the bakery were positive for *S. Typhimurium* with a matching MLVA profile to the human cases in this outbreak.

The NSWFA investigated a report of 2 friends who were ill with diarrhoea, abdominal pain, nausea and headache 9–10 hours after sharing a meal. One case submitted a stool sample, which was positive for *Campylobacter*. The likely exposure was a shared meal consumed 5 days prior to onset of illness. Further investigations were unable to identify a food vehicle.

A complaint by 2 separate groups (6 people each) who ate 8 days apart at the same restaurant was investigated by the NSWFA. Abdominal cramps and diarrhoea were reported symptoms in 11 of 12 people, however, no responsible food vehicle was identified. Based on the incubation period of 12 hours and symptoms reported, the outbreak was likely due to toxins from *C. perfringens* or *Bacillus cereus*.

The NSWFA were notified of 6 people from a group of 20 who developed diarrhoea 12 hours after consuming Madras chicken curry at a restaurant. Whilst a responsible vehicle could not be identified, a bacterial toxin from *C. perfringens* or *B. cereus* could have been introduced due to slow cooling.

A public health unit reported a gastrointestinal illness outbreak; with 87 of 500 people experiencing vomiting and diarrhoea 24 hours after attending a commercially catered function at a school. Participants of the dinner were surveyed (59% response rate) and a pre-prepared salad of poached prawns with Thai herbs was statistically associated with illness (odds ratio (OR) = 6.3, confidence interval (CI) 3.2–13.1). There was no food remaining for testing and there were no stool samples submitted, however, the clinical picture suggests a viral pathogen.

Following a party at a bar, 3 of 25 attendees experienced nausea, abdominal pain and diarrhoea with an incubation period ranging 7–9 hours. Based on the incubation period and symptom profile, with no food or clinical specimens collected, a bacterial toxin was suspected as the cause of the outbreak.

No cause was found for the remaining 7 outbreaks.

Northern Territory

There was a single outbreak of foodborne or suspected foodborne disease reported during the quarter.

The outbreak was identified whilst undertaking a cluster investigation into *S. Saintpaul* cases; with 5 of 8 interviewed cases consuming fruit smoothies from a local market. Locally grown mangoes were thought to be the vehicle with trace back investigations on mangoes used at the stalls attempted, although this was difficult as stall owners/operators used fruit sourced from different local suppliers. Fruit drink stall owner/operators and fruit and vegetable stall owners in Darwin were provided with advice on washing, sanitising and preparing fresh fruit.

Queensland

There were 5 reported outbreaks of foodborne or suspected foodborne disease during the quarter.

Three cases (2 adults and 1 child) of ciguatera fish poisoning were notified to authorities following the consumption of an unknown species of reef fish at a private residence in July. The fish was a private catch with no food samples available for testing. Symptoms of numbness or tingling of skin, reversed temperature sensation, diarrhoea, joint and muscle pain all indicated ciguatera fish poisoning.

Another 3 cases, from a group of six, with suspected ciguatera fish poisoning in adults were notified to authorities. The cases experienced diarrhoea, abdominal cramps, numbness and tingling of extremities, reversed temperature sensation and joint pain 24–48 hours after consumption of the

fish. Coral trout along with barracuda were submitted for testing, with the coral trout positive while the barracuda samples were negative for ciguatoxins.

Three people from the same household ate a chicken curry from a local restaurant and reported illness 8 to 14 hours after consumption of the meal. Microbiological testing of left-over curry identified the presence of *C. perfringens* toxins and coagulase positive staphylococci. One faecal specimen that was collected during the investigation was positive for *C. perfringens*. The cooked curry was reported to be placed into 4 litre capacity plastic tubs, which were held at room temperature for 30–45 minutes before being placed into a freezer. As no temperature monitoring was in place at the restaurant an improvement notice was served to ensure regular temperature monitoring is performed and to cease the process of bulk cooking, cooling and reheating of food.

Authorities investigated a suspected foodborne outbreak among 115 guests who attended a catered wedding. A retrospective cohort study was conducted as part of the investigation where clinical and food history information was obtained on 94 attendees. Of those interviewed, 38 cases (aged between 2–63 years, 1:1 male:female ratio) experienced either vomiting and/or diarrhoea following the consumption of food at the reception or left-over food from the reception on subsequent days. The median incubation period was 5 hours (range 2–38 hours) and the median duration of illness was 1 day.

The cohort study identified multiple foods served at the reception (fried rice, egg yu fung, chicken and mussels) were associated with an increased risk of illness (relative risk (RR) 1.9 to 2.1). High levels of coagulase positive staphylococci and emetic and diarrhoeal strains of *B. cereus* were detected in mixed left-over samples of prawns, pork, corned beef, mussels, noodles, curry, rice, chicken, egg fu yung, taro and seafood salad. High levels of *C. perfringens* were also reported in both samples of fried rice and staphylococcal enterotoxin detected in the fried rice and chicken samples. Both samples of corned meat contained high levels of *Escherichia coli*. Coagulase positive staphylococci were also detected on a chopping board that was used by the caterer. Five faecal specimens and 1 vomitus specimen from persons reporting illness had light to moderate growth of coagulase positive staphylococci. Staphylococcal enterotoxin and *B. cereus* were not detected in any of the clinical specimens. Inappropriate timing of food preparation resulting in long holding times, inadequate food storage, inappropriate defrosting of food and lack of knowledge in safe food handling practice were major contributing factors in this outbreak that resulted in the proliferation and survival of pathogens.

South Australia

There were 2 reported outbreaks of foodborne or suspected foodborne disease during the quarter.

Investigators were notified of a *Campylobacter* infection in a person who attended a team building work function with several other attendees reporting similar symptoms, after which a cohort study was undertaken. The team building function involved 14 people preparing and sharing a meal together. A questionnaire collecting information on demographics, illness and menu items prepared and consumed was undertaken along with discussions with the food supplier, to identify sources of infection. Nine of 12 people had symptoms of gastrointestinal illness with stool samples from 2 attendees testing positive for *Campylobacter*. No food was available for testing.

There was a cluster of 2 *Campylobacter* cases co-infected with *S. Typhimurium* phage type (PT) 108 who worked at a common workplace in remote South Australia. Active case finding further identified a case of *Campylobacter* and a case of *S. Typhimurium* PT 108. The workplace had on-site kitchen facilities, which provided the majority of the food for the workers, with an inspection identifying several food handling issues such as storing raw and cooked food in close proximity and inadequate hand washing facilities in the kitchen. Workers were also not able to maintain appropriate temperature control of their meals when they were in the field.

Victoria

There were 10 reported outbreaks of foodborne or suspected foodborne disease during the quarter.

Two separate groups of people complained of illness after eating at a restaurant with all 4 people in the first group and all 3 people in the second group reporting nausea and diarrhoea approximately 8 hours after their meal. Duration of illness was less than 24 hours. Beef curry and coconut rice were consumed by both groups, with no other common food items identified. Different batches of beef curry, rice and chicken and pork satays were sampled, with *C. perfringens* detected in the pork satay sample. No faecal specimens were collected but the incubation period and illness profile was consistent with *C. perfringens* enterotoxin as the causative agent.

Authorities were notified of 38 of 184 members of a sports club with onset of diarrhoea and abdominal pain the day after attending a dinner. Sixty-six of the 138 attendees were able to be interviewed and 41 reported symptoms. Analysis of food history information showed a statistically significant association with the consumption of the roast beef

meal and illness, RR 12.7 (CI 3.3–48.0). *C. perfringens* enterotoxin was detected in 11 of 12 faecal specimens collected. The beef was roasted the day before the dinner, then kept in the cool-room. The following day the meat was sliced thinly on a slicing machine and then placed into a warmer, without being re-heated. The meat slicer was found to be unclean with pieces of meat and meat juices behind the blade. No leftover food was available for testing.

There were 3 outbreaks in aged care facilities during this quarter where the aetiology was either confirmed or suspected as being caused by *C. perfringens* enterotoxin. Investigators were unable to identify a food source in these outbreaks.

A doctor notified a *Salmonella* case to the Communicable Disease Prevention and Control Unit reporting that 10 family members attended a dinner where chocolate mousse made with raw eggs was served for dessert. Seven of 10 people who consumed the chocolate mousse developed diarrhoea after the function. One of these cases had a faecal specimen collected that was positive for *S. Typhimurium* PT 9. The remaining cases had an illness profile consistent with this aetiology.

Following the receipt of 2 doctors' notifications of *Salmonella* from the same rural town, an investigation revealed that both cases had attended a cooking class at a restaurant prior to onset of illness. Of those interviewed, 13 of 21 attendees and 1 staff member experienced symptoms of diarrhoea and/or vomiting with a median incubation period of 24 hours. Eight cases presented to a doctor. One was admitted to hospital and 4 cases were confirmed as being *S. Typhimurium* PT 170. High risk foods served included a chicken noodle dish and chocolate mousse containing raw eggs. Fourteen of 21 people who ate the chocolate mousse were ill. The chef reported that they do not routinely make food containing raw eggs in the café and catering business. No leftover food or eggs were available for sampling.

Two year 9 students from a boarding school were notified with *Salmonella* after attending a cooking class at a teacher's home. Five students participated in the cooking class where they each made their own batch of ravioli filled with ricotta cheese, roasted pine nuts, fresh parsley, basil and lemon zest. Four of the students tasted the uncooked pasta dough containing the raw eggs. The 5th student and the teacher did not taste the uncooked dough and were not ill. The two students initially notified were confirmed with *S. Typhimurium* PT 135. There were 3 eggs leftover at the end of the class, and on the following day the teacher lightly scrambled these for her young children. Both children were then ill, and one has been confirmed with *S. Typhimurium* PT 135. The

eggs used in the cooking class were traced back to a New South Wales producer and this information was forwarded to the NSW Food Authority.

During routine investigation of a single case of *Salmonella* it was found that several members of 3 families had consumed tiramisu containing raw eggs. One family made the tiramisu and ate it on the same day, and leftovers were taken to be shared with 2 other family groups on the following day. Eleven of 12 people who ate the tiramisu became ill, and a 13th person who did not eat the tiramisu was not ill. Faecal specimens were collected from 3 cases and all 3 were confirmed with *S. Typhimurium* PT 44. No leftover tiramisu or eggs were available for testing.

Ambulance Victoria notified the Victorian Department of Health when a large number of ambulances were requested to assist a number of people with vomiting after consuming lunch at a community centre. Vomiting and/or diarrhoea was reported by 28 of 46 people who were interviewed with a median incubation period of 5 hours after consumption of the lunch. Nine cases presented to hospital, with one being admitted overnight, and 9 cases presented to their general practitioner. No faecal or vomit specimens were collected. The lunch had been provided by a catering company and consisted of a mixture of beef, eggplant, fish and sauces on a bed of rice. Food preparation commenced at 6:00 am, with meals placed into containers from 9:30 am and collected for delivery by car at 11 am. Some meals were placed in a warm oven at the community centre, and consumed at approximately 12:30 pm. High levels of *S. aureus* and *S. aureus* toxin were detected in the meals from 2 unopened containers sampled from the community centre.

Western Australia

There were 2 reported outbreaks of foodborne or suspected foodborne disease during the quarter.

In 1 outbreak, there were 53 cases of gastroenteritis (15 staff and 38 patrons of a hotel), of which 48 were interviewed (13 staff and 35 patrons). All experienced similar symptoms (diarrhoea, vomiting and fever) and duration of illness. For patrons, the median incubation period was 31 hours and the median duration of diarrhoea was 11 hours. One faecal specimen from a patron was positive for norovirus. A case control study was conducted (included 33 ill and 31 not ill patrons) and multivariate analysis showed that eating any salads (OR 5.31, CI 1.31–21.57) and aioli (OR 12.75, CI 1.36–120) were significantly associated with illness. While food samples and environmental swabs were negative for routine pathogens, norovirus testing of foods is not currently available in Western Australia. At least 2 staff-members were ill prior to the date that ill

patrons attended the hotel. There were also reports of ill staff returning to work before the Western Australian Department of Health's recommended period for exclusion from work was completed (until asymptomatic, including normal stools for at least 48 hours). Most of the ill staff had also eaten meals at the hotel. It is most likely that the illness among staff and patrons was due to norovirus and the patrons became ill after eating salad and possibly other foods contaminated with norovirus. It is possible, but cannot be proven, that one or more infected food handlers may have been responsible for the contamination of food. However, other mechanisms of transmission such as person-to-person (e.g. via contaminated surfaces in toilets/bathrooms) may also have caused some illness, especially among staff.

An outbreak of gastroenteritis caused by *Campylobacter* and *Salmonella* occurred amongst attendees at a gala dinner at a function centre. Some cases had mixed infections, with 2 cases positive for *Campylobacter* and *S. Typhimurium* PFGE type 0007; one case was positive for *Campylobacter* and *S. Infantis*; and 3 cases were positive for *Campylobacter* only. A self-administered questionnaire regarding illness and food consumed was completed by 136 of 705 people who attended the dinner with 65 people reporting symptoms of gastroenteritis (minimum attack rate of 9.2%). The median incubation period was 60 hours and median duration of illness was 5 days. Symptoms reported by cases included diarrhoea, abdominal pain, nausea, chills, fever, vomiting and bloody diarrhoea. The multivariate analysis of significant food exposures using the information from 65 ill attendees and 71 non-ill attendees found that illness was statistically associated with consumption of duck parfait (OR 13, 95% CI 1.9–91.5, P 0.01). None of the parfait served at the dinner was available to be tested at the time of the investigation.

Australian Capital Territory and Tasmania

There were no foodborne or suspected foodborne outbreaks investigated during the quarter.

Cluster investigations

During the quarter, OzFoodNet sites investigated a number of clusters, with 7 due to *S. Typhimurium*, 2 clusters due to *S. Saintpaul* and 1 cluster due to each of *S. Montevideo*, *S. Singapore* and norovirus. A cluster of Shiga-toxin producing *E. coli* (STEC) was investigated with 10 cases linked to an agricultural show, with two petting zoos at the show being identified as possible sources.

Both Western Australia and South Australia investigated an increase in reported cases of *S. Typhimurium* PT 135a during the quarter. Western

Australia was notified of an additional 15 cases associated with a cluster investigation that commenced in the first quarter of 2011. Eggs and chicken were consumed by 88% and 82% of the additional cases respectively, with an investigation to trace the origin of chicken isolates continuing. The South Australian cluster involved a primary school, with date of onset of cases spread over a month and indicated potential person-to-person transmission. An environmental inspection was conducted and the classrooms and all toys were sanitised.

Comments

The majority of reported outbreaks of gastrointestinal illness in Australia are due to person-to-person transmission, and in this quarter, 81% of outbreaks ($n=419$) were transmitted via this route. *S. Typhimurium* continues to be a leading cause of foodborne outbreaks in Australia, with 44% (7/16) of outbreaks with a known aetiology due to this *Salmonella* serotype.

Foodborne disease outbreak investigations this quarter have highlighted a range of high risk practices, many occurring in food service settings. Fifteen foodborne disease outbreaks this quarter were associated with foods prepared in a restaurant, while a further six were associated with foods prepared by caterers. Catering for large groups presents particular challenges in ensuring the adequate temperature control of stored foods and preventing cross contamination between raw and cooked foods. There may often be inadequate facilities for the safe storage and handling of large quantities of food at the location where it is to be served.

The consumption of dishes containing raw or undercooked eggs continues to account for a large proportion of outbreaks of foodborne disease in Australia. Of the 34 foodborne or suspected foodborne outbreaks during the quarter, 21% ($n=7$) were egg-associated with six of these outbreaks due to consumption of ready-to-eat foods containing raw eggs, such as raw egg mayonnaise, chocolate mousse, tiramisu and dressings containing raw egg.

A limitation of the outbreak data provided by OzFoodNet sites was the potential variation in the way investigators interpreted features of the outbreak depending on the evidence available. Changes in the number of foodborne outbreaks should be interpreted with caution due to the small number each quarter.

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