Quarterly report

OzFoodNet quarterly report, 1 October to 31 December 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 commenced in Australia between 1 October and 31 December 2013.

Data were received from OzFoodNet epidemiologists in all Australian states and territories. The data in this report are provisional and subject to change.

During the 4th quarter of 2013, OzFoodNet sites reported 674 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 12,038 people, of whom 321 were hospitalised. There were 37 deaths reported during these outbreaks. The majority of outbreaks (543) were due to person-to-person transmission (Table 1), with 55% (298/543) of these occurring in residential aged care facilities and 25% (137/543) occurring in child care centres.

Table 1: Outbreaks and clusters of gastrointestinal illness reported by OzFoodNet, 1 October to 31 December 2013 by mode of transmission

Transmission mode	Number of outbreaks and clusters	Per cent of total*
Foodborne and suspected foodborne	37	5
Person-to-person	543	81
Unknown (*Salmonella* cluster)	10	1
Unknown (other pathogen cluster)	3	<1
Unknown	81	12
Total	674	100

* Percentages do not add to 100 due to rounding.

Foodborne and suspected foodborne disease outbreaks

There were 37 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as being the primary mode of transmission (Appendix). These outbreaks affected 1,028 people and resulted in 50 hospitalisations. There were 3 deaths reported during these outbreaks. This is the same number of outbreaks as were reported in the 4th quarter of 2012 and the same as the 5-year mean for the 4th quarter between 2008 and 2012. A limitation of the outbreak data provided by OzFoodNet sites for this report was 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 Typhimurium was identified as or suspected to have been the aetiological agent in 10 (27%) foodborne or suspected foodborne outbreaks during this quarter, equal to the number from the same quarter in 2012. The aetiological agents for the remaining outbreaks included: norovirus in 8 outbreaks (22%), ciguatoxin in 7 outbreaks (19%), *Campylobacter* in 4 outbreaks (11%), and *Shigella flexneri*, fish wax ester and histamine fish poisoning for 1 outbreak (3%) each. For 5 outbreaks (14%), the aetiological agent was unknown. The 9 outbreaks associated with fish toxins affected 27 people and all but one occurred in Queensland. There were only 2 fish toxin outbreaks recorded in the 4th quarter of 2012 (both histamine fish poisoning in Queensland) affecting 6 people.

Fourteen outbreaks (38% of all the foodborne or suspected foodborne outbreaks) reported in this quarter were associated with food prepared in restaurants (Table 2), compared with 67% (18/27) in the previous quarter and 57% (21/37) in the 4th quarter of 2012.

Table 2: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet, 1 October to 31 December 2013 by food preparation setting

Food preparation setting	Outbreaks
Restaurant	14
Primary produce	9
Commercial caterer	4
Private residence	2
Camp	2
Hospital	1
Bakery	1
Aged care	1
Function centre	1
Grocery store/delicatessen	1
Institution	1
Total	37

To investigate these outbreaks, sites conducted 7 cohort studies, 4 case control studies and collected descriptive case series data for 23 investigations, while for 3 outbreaks no individual patient data were collected. The evidence used to implicate food vehicles included analytical and microbiological evidence in 3 outbreaks, analytical evidence in 3 outbreaks, microbiological evidence in 2 outbreaks, and descriptive evidence in 29 outbreak investigations.

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

Australian Capital Territory

There was 1 outbreak of foodborne illness reported in the Australian Capital Territory during this quarter. The aetiological agent was identified as *Campylobacter jejuni*.

Description of key outbreak

An outbreak of campylobacteriosis was investigated in October following a university college formal dinner. Menu details and contact details for attendees were obtained through the college and a retrospective cohort study was undertaken. Approximately 50 cases of gastroenteritis were identified, including 7 laboratory confirmed *C. jejuni* infections. Multivariate analysis identified chicken liver pâté as being significantly associated with illness (adjusted odds ratio [AOR] 7.2, 95% confidence interval [CI] 3.3–15.7, $P<0.0001$). Samples of leftover pâté were positive for both *C. jejuni* and *C. coli*. The outbreak was assumed to be due to insufficient cooking of chicken livers in the preparation of the pâté.

New South Wales

There were 4 outbreaks of foodborne or suspected foodborne illness reported in New South Wales during this quarter. The aetiological agents were identified as norovirus for 2 outbreaks and *S.* Typhimurium phage type (PT) 170/108* (multilocus variable number tandem repeat analysis [MLVA] profile 03-10-07-14-523) for 1 outbreak. The aetiological agent was unable to be determined for 1 outbreak.

Description of key outbreak

An outbreak of salmonellosis was investigated in October after 7 people presented to an emergency department with gastrointestinal symptoms. All seven reported eating Vietnamese style rolls from the same bakery. Active case finding identified 46 people who reported gastrointestinal illness after eating at this bakery in late October, almost half of whom were hospitalised (21, 46%) and 3 secondary cases. *S.* Typhimurium PT 170/108 (MLVA 03-10-07-14-523) was identified in 36 stool specimens, including the 3 secondary cases. The primary cases all reported eating Vietnamese style rolls with a variety of fillings. Mayonnaise made with raw egg was used in all the rolls. None of the mayonnaise was available at the time of environmental inspection but other samples: pâté, lettuce, and an environmental swab from the cool room were positive for the outbreak strain suggesting a cross-contamination incident. Due to a long chain of resale, the egg supplier could not be definitively identified by the trace-back investigation.

Northern Territory

There were 2 outbreaks of suspected foodborne illness reported in the Northern Territory during this quarter. The aetiological agent was unknown for both outbreaks.

Queensland

There were 15 outbreaks of foodborne or suspected foodborne illness reported in Queensland during this quarter. The aetiological agents were identified as ciguatoxin for 7 outbreaks, norovirus for 2 outbreaks, and *S.* Typhimurium PT 16 (MLVA 03-13-10-12-524), *S.* Typhimurium PT 170/108

* Classification of this organism differs between laboratories, with the Microbiological Diagnostic Unit using PT 170 to classify this type of *Salmonella* Typhimurium and SA Pathology using PT 108 due to a difference in the interpretation of one phenotypic characteristic.

(MLVA 03-09-07-14-524), *S.* Typhimurium (MLVA 03-12-12-09-524) *S.* Typhimurium (MLVA 03-10-07-09-524) and histamine for 1 outbreak each. The aetiological agent was unable to be determined for 1 outbreak.

Description of key outbreak

A large gastroenteritis outbreak was investigated in November among people who consumed meals at multiple Melbourne Cup functions that were catered for by a single catering company. People who ate at 63% (25/40) of the catered functions reported illness with an estimated 350 persons in total affected, including 12 hospitalisations and 1 associated death. *S.* Typhimurium PT 16 (MLVA 03-13-10-12-524) was identified in 83 faecal specimens that were collected from attendees of various functions. Both cohort and case control studies were conducted involving a total of 143 participants. A case control study comprising data collected from 4 catered groups found consumption of potato salad to be significantly associated with illness (odds ratio [OR] 5.5, 95% CI 1.3–23.4, $P=0.009$). A cohort study of a 5th catered function also found consumption of potato salad to be associated with illness but the association was not statistically significant (relative risk [RR] 2.2, 95% CI 0.7–7.0, $P=0.056$).

The outbreak strain was detected in a sample of cooked ham from an unopened catering pack leftover from one function, and in multiple leftover food items including chicken, potato salad and mayonnaise collected from another function. *Escherichia coli* was also detected in some of the leftover foods. Raw eggs used in the preparation of mayonnaise (without further cooking) and then used to dress salad items including the potato salad were considered the likely source of infection for this outbreak. Cross contamination of foods in the kitchen during preparation for these 40 functions was also considered highly likely. The eggs were traced back to a single farm and an audit conducted by SafeFood Queensland indicated compliance with the current egg standards; however, no drag swabs or microbiological testing at the farm level were conducted.

South Australia

There were 2 outbreaks of foodborne or suspected foodborne illness reported in South Australia during this quarter. The aetiological agents were identified as *S.* Typhimurium PT 9 (MLVA 03-24-12-10-523) and *Campylobacter*.

An investigation in November identified 11 cases of *S.* Typhimurium PT 9 (MLVA 03-24-12-10-523) in people who reported eating at the same restaurant over a 1 week period. Four of the cases required hospitalisation. Ten of the cases ate a salt and pepper squid dish that was served with a raw egg based aioli and 1 case was a chef at the restaurant who tried a variety of foods. The restaurant had been the subject of a previous investigation reported a month earlier where coleslaw made with the raw egg aioli base was statistically associated with illness.[1] An environmental inspection was conducted and found inadequate handling practices of the aioli. A sample of aioli was collected from the venue but *Salmonella* was not detected.

Tasmania

There was 1 outbreak of suspected foodborne illness reported in Tasmania during this quarter. The aetiological agent was *Shigella flexneri* and the cases were acquired whilst on camp overseas.

Victoria

There were 8 outbreaks of foodborne or suspected foodborne illness reported in Victoria during this quarter. The aetiological agents were identified as norovirus for 2 outbreaks, and *C. coli*, fish wax ester, *S.* Typhimurium PT 135, *S.* Typhimurium PT 9, *C. jejuni*, and *S.* Typhimurium PT 170/108 for 1 outbreak each.

Description of key outbreak

In early November, health authorities were notified of 6 aged care facility residents with onset of gastrointestinal illness over a 10-day period. It was found that all meals for the facility were prepared in a large central cook-chill kitchen that also supplied a large hospital, several other aged care facilities, a psychiatric unit, several cafes and businesses and a meals on wheels program. In total there were 27 cases (21 confirmed *S.* Typhimurium PT 135 infections and 6 suspected cases), including 2 deaths during the outbreak period. Twelve of 21 confirmed cases and all suspected cases had consumed meals prepared in a central cook-chill kitchen during their incubation period. *S.* Typhimurium PT 135 was detected in a sample of frittata mix collected from the central kitchen. The central kitchen now uses only pasteurised egg products.

Western Australia

There were 3 outbreaks of foodborne or suspected foodborne illness reported in Western Australia during this quarter. The aetiological agents were identified as norovirus for 2 outbreaks and the aetiological agent was unable to be determined for the remaining outbreak.

Description of key outbreak

An investigation was conducted into reports of gastrointestinal illness among 8 people who had independently eaten at a rural hotel in early December. A case series investigation found that ill people had diarrhoea (8/8) and vomiting (8/8) and fever (3/8), with an average incubation period of 28 hours and the average duration of illness of 34 hours. Three specimens were positive for norovirus. Cases had eaten a variety of meals, with hot chips and a side salad common to all cases. Three food handlers were ill and vomited in the staff toilets at the time the cases ate at the hotel. It is likely that a food handler with a norovirus-like illness had contaminated foods that were subsequently eaten by hotel patrons.

Multi-jurisdictional investigation

Salmonella *Typhimurium PT 29 MLVA 03-11-10-11-523*

OzFoodNet commenced a multi-jurisdictional outbreak investigation on 14 October 2013 upon identifying a cluster of *Salmonella* infections among persons from the Australian Capital Territory, New South Wales, South Australia and Victoria who all attended a national sporting institution in Canberra. A case was defined as any person consuming food at the institute between 23 September and 2 October who subsequently developed gastroenteritis, with a confirmed case having a faecal specimen positive for *S.* Typhimurium MLVA 03-11-10-11-523.

In total, 22 cases were linked to the outbreak, including 14 laboratory-confirmed *Salmonella* infections. A cohort study was conducted among the Victorian attendees (29/43 interviewed, 14 cases identified). Univariate analysis identified a number of food items associated with increased risk of illness including consuming fruit smoothies on 26 September (RR 3.1, 95% CI 1.3–7.6, $P=0.005$), muffins on 26 September (RR 2.9, 95% CI 1.6–5.0, $P=0.004$) and chicken and leek pie on 24 September (RR 2.6, 95% 1.1–5.7, $P=0.016$). Multivariate analysis did not identify any exposures associated with increased risk of illness.

Environmental investigations showed the on-site kitchen where these foods were prepared, to be well managed, with no obvious concerns noted. Due to case reports of egg consumption and the frequent implication of eggs as a vehicle for foodborne salmonellosis, trace back of eggs used by the kitchen was undertaken. This revealed the eggs were produced at a New South Wales farm. Environmental sampling performed by primary industry investigators yielded a number of exact or closely related *S.* Typhimurium isolates, including those from chicken faeces, laying sheds and grading areas. The probable cause of this outbreak is transfer of *Salmonella* from eggs used in the institute kitchen, however, a precise transfer mechanism or food vehicle could not be determined.

Cluster investigations

During the quarter, OzFoodNet sites conducted investigations into 13 clusters of infection for which no common food vehicle or source of infection could be identified. Aetiological agents identified during the investigations included 8 *S.* Typhimurium clusters, and 1 cluster each of: *S.* Newport; *S.* Saintpaul; *Listeria monocytogenes*; *Cryptosporidium*; and *C. jejuni*.

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=543) were transmitted via this route, which was comparable with the same quarter in 2012 (n=559) but 54% higher than the 5-year mean (2008–2012) of 352 outbreaks.

S. Typhimurium was identified as the aetiological agent in 10 (27%) of the 37 foodborne or suspected foodborne outbreaks during the quarter (Appendix). Of the 8 confirmed foodborne outbreaks for which an analytical and/or microbiological link to a food vehicle was established, 63% (5/8) were due to *S.* Typhimurium and associated with the consumption of raw or minimally cooked egg dishes.

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Reference

1. OzFoodNet Working Group. OzFoodNet quarterly report, 1 July to 30 September 2013. *Commun Dis Intell* 2015;39(2):E280–284.

Appendix: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet sites, 1 October to 31 December 2013 (n=37)

State or territory	Month*	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
Multi-jurisdictional	Oct	Institution	*Salmonella* Typhimurium PT 29 MLVA 03-11-10-11-523	22	0	AM	Unknown
ACT	Oct	Commercial caterer	*C. jejuni*	50	0	AM	Chicken liver pâté
NSW	Oct	Grocery store/ delicatessen	Norovirus	14	0	A	Turkey, ham and salami wraps
NSW	Oct	Bakery	*S.* Typhimurium PT 170 MLVA 03-10-07-14-523	49	21	M	Vietnamese-style rolls containing raw egg mayonnaise
NSW	Nov	Restaurant	Unknown	8	0	D	Unknown
NSW	Dec	Restaurant	Norovirus	69	0	D	Unknown
NT	Oct	Primary produce	Unknown (suspected histamine)	4	0	D	Mackerel
NT	Dec	Restaurant	Unknown	3	0	D	Unknown
Qld	Oct	Restaurant	Unknown	9	Unknown	D	Unknown
Qld	Oct	Primary produce	Norovirus	4	Unknown	D	Unknown
Qld	Oct	Primary produce	Ciguatoxin	3	0	D	Coral trout
Qld	Oct	Primary produce	Ciguatoxin	3	Unknown	D	Coral trout
Qld	Nov	Restaurant	Histamine	4	0	D	Mahi mahi
Qld	Nov	Commercial caterer	*S.* Typhimurium PT 16 MLVA 03-13-10-12-524	350	12	AM	Potato salad containing raw egg mayonnaise
Qld	Nov	Restaurant	*S.* Typhimurium PT 170/108 MLVA 03-09-07-14-524	20	5	A	Chocolate mousse containing raw egg
Qld	Nov	Primary produce	Ciguatoxin	2	0	D	Cod
Qld	Nov	Commercial caterer	Norovirus	16	0	A	Sandwiches (multiple)
Qld	Nov	Restaurant	*S.* Typhimurium MLVA 03-12-12-09-524	12	4	D	Unknown
Qld	Dec	Restaurant	*S.* Typhimurium MLVA 03-10-07-09-524	9	2	D	Unknown
Qld	Dec	Primary produce	Ciguatoxin	4	0	D	Coral trout
Qld	Dec	Primary produce	Ciguatoxin	2	0	D	Coral trout
Qld	Dec	Primary produce	Ciguatoxin	3	0	D	Coral trout
Qld	Dec	Primary produce	Ciguatoxin	2	0	D	Blue spot coral trout
SA	Oct	Restaurant	*S.* Typhimurium PT 9 MLVA 03-24-12-10-523	11	4	D	Aioli made with raw egg
SA	Nov	Camp	*Campylobacter*	23	0	D	Undercooked chicken patties
Tas.	Oct	Camp	*Shigella flexneri*	7	1	D	Unknown

Appendix (cont'd): Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet sites, 1 October to 31 December 2013

State or territory	Month*	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
Vic.	Oct	Restaurant	Fish wax ester	4	0	D	Rudderfish
Vic.	Oct	Restaurant	*C. coli*	4	0	D	Chicken legs stuffed with a mousse made of raw chicken mince, raw egg and cream
Vic.	Nov	Hospital	*S.* Typhimurium PT 135	27	0	M	Suspected undercooked eggs
Vic.	Nov	Restaurant	Norovirus	34	0	D	Suspected person-to-food-to-person transmission
Vic.	Nov	Private residence	*S.* Typhimurium PT 9	3	0	D	Suspected pasta carbonara containing undercooked eggs
Vic.	Nov	Aged care	*C. jejuni*	11	0		Unknown
Vic.	Nov	Private residence	*S.* Typhimurium PT 170/108	5	1	D	Unknown
Vic.	Nov	Function Centre	Norovirus	178	0	D	Suspected person-to-food-to-person transmission
WA	Oct	Restaurant	Unknown	23	0	D	Unknown
WA	Dec	Restaurant	Norovirus	8	0	D	Salad
WA	Dec	Commercial caterer	Norovirus	28	0	D	Unknown
Total				1,028	50		

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

The number of people affected and hospitalised relate to the findings of the outbreak investigation at the time of writing and not necessarily in the month specified or in this quarter

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 aetiological agent in the suspected vehicle and cases

AM Analytical and microbiological evidence implicating the food vehicle

MLVA Multi-locus variable number tandem repeat analysis

PT Phage type