

Quarterly report

OzFoodNet QUARTERLY REPORT, 1 APRIL TO 30 JUNE 2014

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. In addition, 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 April to 30 June 2014.

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 2nd quarter of 2014, OzFoodNet sites reported 419 outbreaks of enteric illness, including those transmitted by contaminated food or water. 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 7,052 people, 250 of whom were hospitalised, and 35 deaths were reported. This represents a decrease in the number affected and an increase in the number of deaths compared with the 5-year average for the 2nd quarter

(7,600 affected, 234 hospitalised and 22 deaths). The majority of outbreaks (n=305) were due to person-to-person transmission (Table 1), with 55% (169 outbreaks) of these occurring in aged care facilities and 32% (97 outbreaks) occurring in child care facilities or schools.

Foodborne and suspected foodborne disease outbreaks

There were 39 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as being the primary mode of transmission (Appendix). These outbreaks affected 406 people and resulted in 53 hospitalisations. Two deaths were reported during these outbreaks, 1 associated with a *Listeria monocytogenes* outbreak among chemotherapy patients in a New South Wales hospital and the other with a *Salmonella* Typhimurium 135a outbreak in a Victorian hospital.

This was a decrease on the number of foodborne outbreaks that were reported in the 1st quarter of 2014 (n=49) and an increase on the 5-year mean for the 2nd quarter between 2009 and 2013 (n=32). 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.

Table 1: Outbreaks and clusters of gastrointestinal illness and number ill reported by OzFoodNet, Australia, 1 April to 30 June 2014, by mode of transmission

Transmission mode	Number of outbreaks and clusters	Per cent of total*	Number ill
Foodborne and suspected foodborne	39	9	406
Suspected waterborne	0	0	0
Person-to-person	305	73	5,973
Unknown (<i>Salmonella</i> cluster)	22	5	247
Unknown (other pathogen cluster)	4	1	18
Unknown	49	12	408
Total	419	100	7,052

* Percentages do not add to 100 due to rounding.

S. Typhimurium was identified as or suspected to be the aetiological agent in 62% (24/39) of foodborne or suspected foodborne outbreaks during this quarter, a higher proportion than the number from the same quarter in 2013 (30%, 9/30). The aetiological agents for the remaining outbreaks included: norovirus and *S. Infantis* in 2 outbreaks each, *Amanita phalloides* (death cap mushrooms), ciguatoxin, hepatitis E virus (HEV), histamine poisoning, *Campylobacter*, and *L. monocytogenes* for 1 outbreak each. For 5 outbreaks the aetiological agent was unknown.

Sixteen outbreaks (41% of all the foodborne or suspected foodborne outbreaks) reported in this quarter were associated with food prepared in restaurants (Table 2), which is higher than the average number associated with foodborne or suspected foodborne outbreaks in the 2nd quarter from 2009 to 2013 (38%).

To investigate these outbreaks, sites conducted 3 cohort studies, 2 case control studies and collected descriptive case series data for 29 investigations, while for 5 outbreaks no individual patient data were collected. The evidence used to implicate food vehicles included analytical evidence in 4 outbreaks, microbiological evidence in 6 outbreaks, and descriptive evidence in 29 outbreaks.

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

Australian Capital Territory

There were 2 outbreaks of foodborne or suspected foodborne illness reported in the Australian Capital Territory during this quarter. The aetiological agents identified were *A. phalloides* and *S. Typhimurium*.

Description of key outbreak

An outbreak was investigated in April after 3 people with gastroenteritis reported eating a home-cooked meal containing mushrooms. The mushrooms were subsequently identified as *A. phalloides*, and 1 case was transferred to a New South Wales health care facility for ongoing clinical care. It was reported to authorities that the mushrooms had been purchased from a national supermarket chain. However, the investigation showed no evidence to support this. A 4th but unrelated New South Wales case was seen at an Australian Capital Territory hospital before transfer to an New South Wales health care facility for further care.

New South Wales

There were 11 outbreaks of foodborne or suspected foodborne illness reported in New South Wales during this quarter. The aetiological agents were identified as *S. Typhimurium* for 7 outbreaks and *L. monocytogenes*, norovirus, HEV and histamine poisoning for 1 outbreak each.

Description of key outbreaks

An outbreak was investigated in April after a single notification of HEV infection led to the identification of 5 cases among a group of 9 work colleagues. An interview of the 1st notified case found that a work colleague from Victoria also had HEV infection, and that the only common exposure for both cases was a restaurant dinner with 7 other work colleagues on 11 March. Further investigations included interviewing and serological testing of co-dining work colleagues, which identified a further 3 cases. Case interviews revealed that pork pâté was the only food consumed by all the cases. An additional

Table 2: Outbreaks of foodborne or suspected foodborne disease and number ill reported by OzFoodNet, Australia, 1 April to 30 June 2014 by food preparation setting

Food preparation setting	Outbreaks	Per cent of foodborne outbreaks	Number ill
Restaurant	16	41	132
Private residence	11	28	65
Bakery	4	10	77
Takeaway	3	8	39
Commercial caterer	1	3	6
Hospital	1	3	22
Institution	1	3	57
Primary produce	1	3	3
Unknown	1	3	5
Other	0	0	0
Total	39	100	406

10 infected individuals, unrelated to the work group, were also linked to this cluster. All 10 cases reported consuming pork pâté at the same restaurant on different dates to the work group (13 March, 15 March, 3 May and 15 May). The New South Wales Food Authority (NSWFA) inspected the restaurant on 2 occasions on 15 and 21 May 2014 and found it to be very well-run with no issues identified in food handling, cooking or cleaning. Pork samples from the restaurant were tested but all were negative for HEV. The pork pâté was made with pork livers and included only one short cooking step. It is suspected that on one or more occasions the pork livers had been inadvertently undercooked leading to the survival of HEV in the pâté. Trace back of the pork livers revealed that a single pig farm supplied the livers that were served as pork pâté on the days the cases reported eating at the restaurant.

In addition to the HEV cases above, 3 notifications of locally acquired HEV from 2013 with no known source of infection were re-investigated. Interviews revealed that 2 cases had also eaten pork pâté at the same restaurant during their incubation period (the 3rd case was thought to be person-to-person transmission). An additional case from October 2013, identified on retrospective testing of stored sera was also linked to the cluster. The viruses from 11 of the 18 cases linked to the restaurant (3 from 2013 and 8 from 2014) were genetically sequenced and were found to be closely related, suggesting a common source. Undercooked pork has been associated with cases of foodborne HEV overseas. An HEV expert panel was convened and it was concluded there was no ongoing public health risk associated with the restaurant.

An outbreak was investigated in April after 3 cases of *L. monocytogenes* were notified within a month. All 3 cases reported attending the same chemotherapy treatment facility in a 2-week period. *Listeria* isolates from the 3 cases had the same binary type (158), multi-locus variable number tandem repeat analysis (MLVA) profile (04-17-16-05-03-11-14-00-16), serotype (1/2b, 3b, 7) and pulsed-field gel electrophoresis (PFGE) type (4:4:5A). Two of the cases reported eating sandwiches on multiple visits to the facility but the 3rd case denied eating anything. The facility sourced its food from a café next door, which was inspected by the NSWFA, and while considered generally well run, a sample of cucumber tested positive for the outbreak strain. As the food provider was a public café, rather than a food provider for vulnerable populations, it was not required to be *Listeria* free. Although not all cases reported eating food provided from the café, the identical typing of the cases and the food isolate (a novel type), indicates that it is likely the

case had eaten from the café but could not recall on interview. The café was advised of ways to help reduce the possibility of having *Listeria* on foods, and the chemotherapy facility was advised on the importance of food safety for vulnerable populations, with particular reference to *Listeria*.

Northern Territory

There were 5 outbreaks of suspected foodborne illness reported in the Northern Territory during this quarter. *S. Typhimurium* phage type (PT) 9 was identified as the aetiological agent for 1 outbreak and the remaining 4 outbreaks had unknown aetiology.

Description of key outbreak

An outbreak was investigated in April in response to reports of gastroenteritis among 9 people after a restaurant meal. Two cases tested positive for *S. Typhimurium* PT 9 infection. A cohort study was conducted and high risk foods identified included a 'Surf and Turf' dish (eaten by 8 of 9 cases) and the raw-egg Hollandaise sauce, which accompanied this, as well as another dish. The Hollandaise sauce was made on site and an environmental health inspection of the restaurant identified that improper storage of this sauce after preparation was a likely contributing factor to the outbreak. Food samples were taken from the kitchen but none tested positive for *Salmonella*.

Queensland

There were 7 outbreaks of foodborne or suspected foodborne illness reported in Queensland during this quarter. The aetiological agents were identified as *S. Typhimurium* for 4 outbreaks, and ciguatoxin and *Campylobacter* for 1 outbreak each. The remaining outbreak had an unknown aetiology.

Description of key outbreaks

An outbreak was investigated in April after reports of gastroenteritis among 57 of the at least 247 residents of a tertiary residential college. A total of 20 cases were laboratory confirmed with *S. Typhimurium* MLVA 03-09-07-12-524. All students residing at the college at the time of the outbreak were emailed a detailed food history questionnaire in an attempt to identify a common food vehicle. Seventy-seven questionnaires (31%) were returned for analysis. Results were inconclusive. Using a case-control methodology, 2 food items consumed had elevated odds ratios (OR) but were not statistically significant: chilli con carne (OR 2.6, 95% confidence interval (CI) 0.7 to 8.9) and chicken schnitzel (OR 3.3, 95% CI 0.7 to 16.0).

Multiple food samples including left-over ready-to-eat produce, eggs, egg products and poultry were collected from the college cafeteria for microbiological testing. However, all tested negative for *Salmonella*. The microbiological quality of some samples were likely to have been compromised as the left-over food was scheduled to be discarded and had been steamed to remove food residue from the chafing dish. The detection of *Bacillus cereus* and *Staphylococcus aureus* from environmental swabs taken during the investigation indicated inadequate cleaning and sanitising of contact surfaces within the kitchen environment. No vehicle or source of infection was identified during this investigation.

An outbreak of gastroenteritis was investigated in May among attendees of a luncheon that was held in the Wide Bay area of Queensland. Seven of 63 people who attended the event developed gastrointestinal symptoms within 4 days of attendance. Five cases were hospitalised and 4 cases were diagnosed with *Campylobacter* infection. The luncheon was catered by the various attendees and included a fixed menu consisting of roast beef, vegetables, gravy, apple crumble with custard, and jugs of tank water were also available for consumption. No remaining food samples were available for microbiological analysis, but samples collected from the rainwater tank were positive for *Campylobacter*. No genotyping was able to be performed to compare human and non-human isolates. The rainwater tanks were the suspected source of infection for these cases and have since been decommissioned by the local council.

South Australia

There were 2 outbreaks of foodborne or suspected foodborne illness reported in South Australia during this quarter. The aetiological agent was identified as *Salmonella* Typhimurium in both outbreaks.

Tasmania

There were no outbreaks of suspected foodborne illness reported in Tasmania during this quarter.

Victoria

There were 8 outbreaks of foodborne or suspected foodborne illness reported in Victoria during this quarter. The aetiological agents were identified as *S. Typhimurium* for 7 outbreaks and norovirus for the remaining outbreak.

Description of key outbreak

An outbreak was investigated in May after 3 notifications of *S. Typhimurium* PT 170/108 MLVA 03-10-07-12-523 in the same family. All 5 family members had consumed a chicken meal and a chocolate mousse cake during their incubation period. Two weeks later a 2nd group of 5 people all reported being ill and 2 were confirmed with the outbreak strain after eating a chocolate mousse cake from the same bakery. Along with the members of this group, all notified cases of *S. Typhimurium* PT 170/108 in the suburbs surrounding the bakery were then interviewed. A total of 24 cases of illness, with 15 being confirmed as *S. Typhimurium* PT 170/108, were found to have consumed chocolate mousse cake from this bakery over a 4-week period. Council found that the premises made large batches of chocolate mousse and cakes and froze them for use over at least 4 weeks. Two samples of the cakes were positive for *S. Typhimurium* PT 170/108. The eggs used in the chocolate mousse were traced back to a distributor who purchased eggs from multiple farms.

Western Australia

There were 4 outbreaks of foodborne or suspected foodborne illness reported in Western Australia during this quarter. The aetiological agents were identified as *S. Typhimurium* in 2 outbreaks and *S. Infantis* for the remaining 2 outbreaks.

Description of key outbreak

An outbreak was investigated in May after 5 cases reported gastrointestinal symptoms from 3 different groups who ate at the same restaurant. Two cases, in 2 separate groups, were confirmed with *S. Typhimurium* PT 9, PFGE 0001 infection. A structured questionnaire was used to obtain specific information from the 21 people in 3 different groups. The data were analysed as a case control study and there was a statistical association between eating the lamb shanks meal (P value = 0.0003) and raw salad (P value = 0.0251) and becoming ill. There were no remaining food samples available for testing and surface swabs from the kitchen were negative for routine pathogens. No staff reported illness. Lamb shanks were cooked prior to the meal and stored in the cool room. Cases also reported that the lamb shanks were not hot when served. An inspection of the kitchen revealed that cross contamination between meats may have occurred in the cool room as uncovered cooked chicken was stored below raw meat that was defrosting.

Cluster investigations

During the quarter, OzFoodNet sites conducted investigations into 75 clusters of infection for which no common food vehicle or source of infection could be identified. Aetiological agents identified during the investigations included 14 *S. Typhimurium* clusters, 2 norovirus clusters, 2 *S. Saintpaul* clusters, 2 *S. Wangata* clusters and 1 cluster each of: *Escherichia coli* O157, *E. coli* O26, *S. Mbandaka*, *S. Virchow*, *C. jejuni*, and 1 mixed cluster of *Campylobacter*, *S. Infantis* and cryptosporidium.

Comments

A. phalloides poisoning is rare in Australia but causes severe gastrointestinal symptoms that can lead to death. This species resembles the edible straw mushroom (*Volvariella volvacea*), which commonly grows in Asia and may be a contributing factor in their consumption.¹ In 2012, 3 of 4 workers in a restaurant in the Australian Capital Territory became ill after a post-service staff meal containing *A. phalloides*, leading to 2 deaths.²

The majority of reported outbreaks of gastrointestinal illness in Australia are due to person-to-person transmission, and in this quarter 73% of outbreaks (n=305) were transmitted via this route, which was slightly lower than for the same quarter in 2013 (n=315) and lower than the 5-year mean (2nd quarter 2009 to 2013) of 330 outbreaks.

S. Typhimurium was identified as the aetiological agent in 62% (24/39) of foodborne or suspected foodborne outbreaks during this quarter (Appendix). Of the 10 confirmed foodborne outbreaks for which an analytical and/or microbiological link to a food vehicle was established, 5 were due to

S. Typhimurium and 3 of these were associated with the consumption of raw or minimally cooked egg dishes.

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2. OzFoodNet Working Group. OzFoodNet quarterly report, 1 January to 31 March 2012. *Commun Dis Intell* 2012;36(4):E353–E360.

Appendix: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet sites,* Australia, 1 April to 30 June 2014 (n=39)

State or territory	Month†	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
ACT	Apr	Private residence	<i>Amanita phalloides</i> (death cap mushrooms)	3	3	D	Curry containing mushrooms
ACT	Apr	Private residence	<i>Salmonella</i> Typhimurium PT 9 MLVA 03-10-14-12-498	2	2	D	Milkshake containing raw egg
NSW	Apr	Restaurant	Hepatitis E virus	7	2	A	Pork liver pate
NSW	Apr	Restaurant	<i>S. Typhimurium</i> MLVA 03-13-10-11-523	4	0	D	Unknown
NSW	Apr	Bakery	<i>S. Typhimurium</i> MLVA 03-17-10-11-523	33	7	M	Raw egg mayonnaise
NSW	Apr	Takeaway	<i>S. Typhimurium</i> MLVA 03-26-07-20-496	11	2	D	Raw egg salad dressing
NSW	Apr	Restaurant	<i>S. Typhimurium</i> MLVA 03-09-07-12-523	7	1	M	Multiple foods
NSW	May	Restaurant	<i>Listeria monocytogenes</i> Binary type 158 MLVA 04-17-16-05-03-11-14-00-16, serotype 1/2b, 3b, 7 and PFGE 4:4:5A	3	3	D	Unknown
NSW	May	Restaurant	Norovirus	6	0	D	Garden salad
NSW	May	Takeaway	<i>S. Typhimurium</i> MLVA 03-10-07-12-523	11	1	D	Vietnamese rolls raw egg
NSW	Jun	Private residence	<i>S. Typhimurium</i> MLVA 03-24-12-10-523 (9) and 03-24-13-10-523 (1)	13	0	D	Tiramisu with raw egg
NSW	Jun	Restaurant	<i>S. Typhimurium</i> MLVA 03-12-12-09-523	9	1	D	Unknown
NSW	Jun	Private residence	Histamine poisoning	2	2	D	Tuna steaks
NT	Apr	Restaurant	<i>S. Typhimurium</i> PT 9	9	3	A	Hollandaise sauce containing raw eggs
NT	Apr	Restaurant	Unknown	5	0	D	Unknown
NT	Apr	Restaurant	Unknown	2	0	D	Unknown
NT	May	Private residence	Unknown	3	0	D	Unknown
NT	Jun	Restaurant	Unknown	2	0	D	Unknown
Qld	Apr	Primary produce	Ciguatoxin	3	0	M	Spanish mackerel
Qld	Apr	Restaurant	<i>S. Typhimurium</i> MLVA 03-12-13-09-524	3	2	D	Suspected egg and lettuce sandwiches
Qld	Apr	Bakery	<i>S. Typhimurium</i> MLVA 03-09-07-11-524	8	0	D	Various bakery products (custard buns)
Qld	Apr	Institution	<i>S. Typhimurium</i> MLVA 03-09-07-12-524	57	4	D	Unknown
Qld	Apr	Unknown	<i>S. Typhimurium</i> MLVA 03-09-07-12-524	5	0	D	Unknown
Qld	Apr	Restaurant	Unknown	2	0	D	Suspected raw oysters
Qld	May	Private residence	<i>Campylobacter</i>	7	5	M	Tank water
SA	Apr	Bakery	<i>S. Typhimurium</i> PT 170/108	12	3	D	Raw egg butter on Vietnamese roll

Appendix continued: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet sites,* Australia, 1 April to 30 June 2014 (n=39)

State or territory	Month†	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
SA	Apr	Takeaway	S. Typhimurium PT 170/108	17	2	D	Raw egg mayonnaise on Vietnamese roll
Vic.	Apr	Private residence	S. Typhimurium PT 135a	13	1	D	Tiramisu
Vic.	Apr	Private residence	S. Typhimurium PT 135a	4	1	D	Uncooked brownie batter
Vic.	May	Restaurant	Norovirus genogroup II (GII)	45	Unknown	A	Probable food handler
Vic.	May	Private residence	S. Typhimurium PT 135a	6	5	D	Raw egg chocolate mousse
Vic.	May	Bakery	S. Typhimurium PT 170/108	24	1	M	Raw egg chocolate mousse
Vic.	May	Restaurant	S. Typhimurium PT 9	21	Unknown	D	Raw egg aioli/mayonnaise
Vic.	Jun	Hospital	S. Typhimurium PT 135a	22	1	D	Unknown
Vic.	Jun	Private residence	S. Typhimurium PT 99	2	0	D	Raw egg chocolate mousse
WA	Apr	Commercial caterer	S. Infantis	6	0	D	Nasi-Lemak
WA	Apr	Restaurant	S. Infantis	2	0	D	Unknown
WA	Apr	Private residence	S. Typhimurium PT 135 PFGE 0003	10	1	D	Unknown
WA	Apr	Restaurant	S. Typhimurium PT 9 PFGE 0001	5	0	A	Lamb shanks or salad
Total				406	53		

* No foodborne outbreaks were reported in Tasmania during the quarter

† 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

PT Phage type

MLVA profile Multi-locus variable number tandem repeat analysis profile

PFGE type Pulsed-field gel electrophoresis type