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The OzFoodNet Working Group

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Quarterly Report

OzFoodNet quarterly report, 1 October to 31 December 2015

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 October and 31 December 2015.

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 2015 (1 October to 31 December), OzFoodNet sites reported 585 outbreaks of enteric illness, including those transmitted by contaminated food or water. Outbreaks of gastroenteritis are often not reported to health authorities, which results in current figures under-representing the true burden of enteric disease outbreaks within Australia. There were 10,184 people affected in these outbreaks and 240 hospitalisations. There were 22 deaths reported during these outbreaks. This represents an increase in the number of people affected compared with the 5-year average from 2010 to 2014 for the 4th quarter (n=9,077). The majority of reported outbreaks of gastrointestinal illness in Australia are due to person-to-person transmission. In this quarter, 80% (469/585) of outbreaks were transmitted via this route (see Table 1). This percentage was similar to the same quarter in 2014 (78%, 469/601). The total number and the proportion is also similar to the 5-year average (4th quarter, 2010-2014) of 409 outbreaks (79%, 409/518) outbreaks transmitted person-to-person. Of the person-to-person outbreaks in the 4th quarter of 2015, 46% (216/469) occurred in child care facilities and 41% (193/469) occurred in aged care facilities.

Table 1: Outbreaks and clusters of gastrointestinal illness and number ill reported by OzFoodNet, Australia, 1 October to 31 December 2015, by mode of transmission.

Transmission mode	Number of outbreaks and clusters	Per cent of total outbreaks and clusters (%) [*]	Number ill
Person-to-person	469	80	8,797
Unknown	51	9	523
Foodborne and suspected foodborne	47	8	586
<i>Salmonella</i> cluster	13	2	223
Other pathogen cluster	2	<1	33
Suspected waterborne	3	<1	22
Total	585	100	10,184

^{*} May not add up to 100% due to rounding.

Foodborne and suspected foodborne disease outbreaks

There were 47 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as being the primary mode of transmission (Appendix 1). These outbreaks affected 586 people, of which 150 were laboratory confirmed cases, and resulted in 45 hospitalisations. There were 2 deaths reported during these outbreaks. This was an increase on the number of foodborne outbreaks that were reported in the 3rd quarter of 2015 (n=37) and an increase on the 5-year average for the 4th quarter between 2010 and 2014 (n=40). The number of people affected was a 23% increase on the number affected in the 3rd quarter of 2014 (474), but a 14% decrease on the 5 year mean (2010 to 2014) for this quarter (n=683).

The data within this report, provided by OzFoodNet sites, has associated limitations, including the potential variation in categorisation of features of outbreaks, depending on varied circumstances and investigator interpretation. Changes in the number of foodborne disease outbreaks should be interpreted with caution due to the small number each quarter.

Salmonella Typhimurium was identified as, or suspected to be, the aetiological agent in 32% (15/47) of foodborne or suspected foodborne outbreaks during this quarter (Appendix 1); a similar proportion to that for the same quarter in 2014 (41%, 22/54). The aetiological agents for the remaining outbreaks included *Campylobacter* (for 4 outbreaks), norovirus (for 3 outbreaks), histamine fish poisoning (for 2 outbreaks), ciguatoxin, *Clostridium perfringens*, paralytic shellfish poisoning, hepatitis A virus, *S. Virchow*, *S. Muenchen* and monophasic *Salmonella* (for one outbreak each). For 16 outbreaks the aetiological agent was unknown.

Twenty-six outbreaks (55% of all foodborne or suspected foodborne outbreaks) reported in this quarter were associated with food prepared in restaurants (Table 2). This is higher than the 5 year mean number and proportion of restaurant-associated foodborne or suspected foodborne outbreaks in the 4th quarter from 2010 to 2014 (48%, 19/40).

To investigate these outbreaks, sites conducted 4 case control studies, 4 cohort studies and collected descriptive case series for 21 outbreaks. For 18 outbreaks, no individual patient data

Table 2: Outbreaks of foodborne or suspected foodborne disease and number ill reported by OzFoodNet, Australia, 1 October to 31 December 2015, by food preparation setting.

Food preparation setting	Number of outbreaks	Per cent of foodborne outbreaks (%)*	Number ill	Number laboratory confirmed
Restaurant	26	55	289	42
Private residence	5	11	21	11
Commercial caterer	3	6	110	20
Take-away	3	6	13	11
Primary produce	2	4	6	0
Aged care	2	4	47	30
Grocery store/delicatessen	2	4	14	0
Other	1	2	63	20
Bakery	1	2	12	12
Community	1	2	4	4
Fair/festival/mobile service	1	2	7	0
Total	47	100	586	150

* May not add up to 100% due to rounding.

were collected. The evidence used to implicate food vehicles included analytical evidence in 6 outbreaks, both analytical and microbiological evidence in one outbreak, descriptive and microbiological evidence in one outbreak and descriptive evidence in 39 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 (ACT) in this quarter. The aetiological agent identified was norovirus for one outbreak and suspected histamine fish poisoning for the other.

Description of outbreak

A suspected foodborne outbreak was identified via 2 complaints following 2 separate events at different locations catered by the same company. A cohort study was undertaken and food histories were obtained for 43 of the 50 attendees from the 2 events. Over half (67%, 29/43) reported diarrhoea and/or vomiting a median of 37 hours after eating. Four cases submitted stool samples (3 from one event and one from the other event) and norovirus was detected in all 4 specimens. Food served included a variety of wraps, sandwiches, and fruit. In univariate analysis, there was a significant association between eating the baked chicken wrap (relative risk [RR] 1.79; 95% CI 1.17-2.75, $P < 0.05$) or the tandoori chicken wrap (RR 1.68; 95% CI 1.11-2.56, $P < 0.05$) and illness. Multivariate analysis showed illness to be significantly associated with eating chicken wraps (odds ratio [OR] 23.3; 95% CI 2.14-254.01, $P < 0.05$). An environmental investigation did not identify any food safety concerns and food handlers for these events were reportedly well. Samples of food prepared in the same batch that was served at the 2 events were within satisfactory limits for all bacterial pathogens tested for; however, the samples were unable to be tested for norovirus.

New South Wales

There were 21 outbreaks of foodborne or suspected foodborne illness reported in New South Wales (NSW) in this quarter. The aetiological agents were identified as *S. Typhimurium* (for 6 outbreaks), norovirus, *Campylobacter* species and histamine fish poisoning (for one outbreak each). In 14 outbreaks, the food vehicle was unknown, while for the other 7 outbreaks, a suspected food vehicle could be implicated. This included *S. Typhimurium* infection linked to consumption of items containing undercooked egg.

Description of key outbreaks

A public health unit (PHU) received a report of a person who was hospitalised with gastroenteritis and subsequently tested PCR positive for *Salmonella*. This person reported others who ate a meal with the person at a restaurant also experienced symptoms. The PHU initiated a cohort study and found 40 of the 69 attendees reported illness after the dinner, with onsets over a 7 day period. Seven diners submitted stool samples which were positive for *S. Typhimurium* (MLVA 03-26-13-08-523). The meal was a 6 course degustation and most items were consumed by most of the diners, however a univariate analysis found a significantly increased risk ratio was found for one item, a coriander mayonnaise (RR 3.58, CI 1.04-12.26, $P < 0.001$). This mayonnaise was made with raw egg and on inspection was found to be made with insufficient acidifying ingredient to neutralise any *Salmonella* present. Environmental and food samples were taken by the NSWFA and all were negative for pathogens. However, the food samples taken consisted of stock received 12 days after the dinner. The cause of the outbreak was likely the use of contaminated raw egg dishes. The restaurant was advised to cease serving foods containing raw egg.

Northern Territory

There were 2 outbreaks of foodborne or suspected foodborne illness investigated in the Northern Territory (NT) this quarter. The aetiological agent was unknown for both outbreaks.

Queensland

There were 8 outbreaks of foodborne or suspected foodborne illness reported in Queensland in this quarter. *S. Typhimurium* was identified as the aetiological agent for 5 outbreaks. This included *S. Typhimurium* infection linked to consumption of items containing undercooked egg. *S. Virchow*, ciguatoxin and *Campylobacter jejuni* were identified as the aetiological agent for one outbreak each.

Description of key outbreak

An outbreak of gastroenteritis was reported to Queensland Health among attendees of a ladies sporting club tournament that was held in Brisbane. The tournament consisted of members from at least 13 different clubs with a total of 120 participants. Investigations were initiated and questionnaires were administered to 90 attendees. A total of 63 people reported symptoms including vomiting, diarrhoea, stomach cramps and fever over a 7 day period. The cases were aged between 45 and 85 years (median 72 years). Several hospitalisations were reported, though this information was not accurately recorded. Twenty cases were laboratory confirmed with *Campylobacter* (*C. jejuni* identified in ten cases). Descriptive information obtained from the interviews identified that cooked sliced ham was consumed by the majority of cases. The ham was supplied by a local butcher. An audit was conducted at the butcher and multiple hygiene issues and potential for cross contamination between raw and cooked product were observed. Environmental samples and swabs were collected during the inspection, with *E. coli* and *Listeria monocytogenes* isolated from a sample of sliced cooked ham. No *Campylobacter* was detected on the ham or environmental samples; however *C. coli* and *C. jejuni* were detected

on a sample of raw chicken meat that was also collected from the butcher. Whole genome sequencing was conducted on 7 case isolates and the chicken isolates. All of the cases demonstrated a high genetic similarity; however, the chicken isolates were unrelated. Investigations were unable to identify any significant food handling issues at the kitchen where the tournament was held. It was postulated that the outbreak was likely a result of cross contamination from raw product to the cooked ham within the butcher shop. This highlights the potential food safety hazard with the sale of ready to eat food within these establishments.

South Australia

There were 2 outbreaks of foodborne or suspected foodborne illness reported in South Australia (SA) in this quarter. The aetiological agents were *S. Typhimurium* PT9 and *S. Typhimurium* PT135.

Tasmania

There was one suspected foodborne outbreak reported in Tasmania in this quarter. The aetiological agent was identified as paralytic shellfish toxin.

Description of key outbreaks

During the latter part of 2015 there was a 'bloom' of the dinoflagellate *Alexandrium tamarense* around east coast of Tasmania. There were several recalls of commercial products and public health alerts were issued not to eat wild shellfish. There were 4 cases of paralytic shellfish toxin (PST) poisoning that were reported due to eating wild mussels harvested from one area on the east coast. There were 3 separate clusters of one or 2 cases each. The majority of cases were male (75%) with the median age of cases being 59 years (mean 57.5 years, range 51-61 years). Onsets of illness ranged over a 12 day period. The most frequently reported symptoms included numbness/tingling (4/4) and muscle weakness (4/4). Two cases were hospitalised. The median

time between exposure and onset of symptoms was 1.25 hours (mean 3.6 hours, range 0.5-11.7 hours). All cases recovered.

Public health alerts were scaled back in January 2016 with the receding of the bloom. Temporary signage had been erected at various locations along the east coast of Tasmania during the incident and warned against eating wild shellfish. Permanent signage is planned as future blooms of *A. tamarensis* are considered to be on ongoing risk for Tasmania over the coming years.

Victoria

There were 6 outbreaks of foodborne or suspected foodborne illness reported in Victoria in this quarter. The aetiological agents identified were: *Campylobacter* for 2 outbreaks; *Salmonella* subsp I ser 4,5,12:i:- (PT9); *Clostridium perfringens* enterotoxin and norovirus for were identified for one outbreak each and for one outbreak the aetiological agent was suspected to be *Campylobacter*. In one outbreak, the food vehicle was unknown, while for the other 5 outbreaks, a suspected food vehicle was implicated.

Description of key outbreak

In November, a local council notified the Victorian Department of Health and Human Services of 3 separate complaints from people who ate at a Greek restaurant over 2 nights and had onsets of diarrhoea and cramps 3 to 6 hours after eating. Booking lists were obtained and a total of 13 cases were identified from several groups over the 2 nights. A menu based questionnaire was administered to 37 attendees; 13 cases and 24 people who were not ill. The median incubation period for cases was 9 hours and duration of illness 24 hours. There were a large number of items on the restaurant's menu and many of the meats were cooked on vertical skewers and used for gyros, burgers and wraps. The case control study provided significant associations with several meat products. The variable "Any chicken meat" had an OR of 121 (95% CI 7.9 to 5421, $p < 0.001$). Two cases submitted faecal specimens that were both positive for

Clostridium perfringens enterotoxin. Local council found deficiencies in food safety for sauces that contained raw eggs, and the temperatures for holding kebab meat after shaving from skewers. Numerous food samples were collected from the restaurant including mayonnaise, peri peri sauce and lamb pizzas and all were negative for bacterial pathogens and toxins. The meats from skewers were not tested. The most likely source for this outbreak was the chicken meat cooked on skewers, shaved and held out of temperature control for unknown periods of time.

Western Australia

There were 5 outbreaks of foodborne or suspected foodborne illness reported in Western Australia (WA) in this quarter. The aetiological agents were hepatitis A and *S. Muenchen* for one outbreak each.

Description of key outbreaks

Five cases of hepatitis A with onsets between October 2015 and January 2016 had the same hepatitis A genetic sequence as the multijurisdictional hepatitis A outbreak strain from early 2015.¹ Cases included 4 males and one female, and ages ranged from 1 to 42 years (median 12 years). One case lived in rural WA and 4 cases lived in metropolitan Perth. Three of the cases were in one family which included a 42 year old male, and his 2 asymptomatic children. Signs and symptoms of the 3 ill cases were jaundice ($n=3$), fever ($n=3$), abdominal pain ($n=2$) and vomiting ($n=1$). All cases had eaten home-made smoothies containing frozen berries from a common WA supplier.

Multi-jurisdictional investigations

There were no multi-jurisdictional investigations in this quarter.

Cluster investigations

During this quarter, OzFoodNet sites conducted investigations into 15 clusters of infection for which no common food vehicle or source infec-

tion could be identified. Aetiological agents that were able to be identified during the investigations included *S. Typhimurium* (for 9 clusters), *S. Mississipi*, *S. Infantis*, *S. Saintpaul*, *S. Litchfield*, *Salmonella* subsp I (PT 193, multi-drug resistant) and *Cryptosporidium* species (1 cluster each).

Comments

OzFoodNet conducted an Advanced Outbreak Investigation Workshop in Newcastle, New South Wales, on 22 to 23 October 2015. The workshop followed a single case study that tracked the investigation of a point source food-borne disease outbreak and covered topics such as: hypothesis generation; questionnaires and interviewing; case definitions; epidemiological summaries; roles and responsibilities; analytic methods; statistics; univariate analysis; multivariate analysis; model building; and weight of evidence.

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Reference

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Appendix 1: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet sites*, 1 October to 31 December 2015 (n=47)

State or Territory	Month [†]	Setting Prepared	Agent responsible	Number affected [‡]	Number lab confirmed	Number hospitalised [‡]	Evidence	Responsible vehicles
ACT	Dec	Private residence	Suspected histamine fish poisoning	3	0	0	D	Tuna fish
ACT	Nov	Commercial caterer	Norovirus	29	4	0	A	Wraps
NSW	Dec	Restaurant	<i>S. Typhimurium</i> MLVA 3-10-09-09-523	3	1	0	D	Unknown
NSW	Dec	Restaurant	Unknown	5	0	0	D	Unknown
NSW	Dec	Restaurant	Unknown	5	0	0	D	Unknown
NSW	Dec	Restaurant	Unknown	18	0	0	D	Unknown
NSW	Dec	Restaurant	<i>Campylobacter</i>	2	1	1	D	Chicken liver pâté
NSW	Dec	Restaurant	<i>S. Typhimurium</i> MLVA 3-26-13-8-523	2	2	0	D	Battered fish
NSW	Dec	Take-away	Unknown	2	0	0	D	Chicken curry
NSW	Nov	Grocery store/delicatessen	Unknown	4	0	0	D	Oysters
NSW	Nov	Private residence	<i>S. Typhimurium</i> MLVA 3-9-7-12-523	3	3	3	D	Unknown
NSW	Nov	Restaurant	<i>S. Typhimurium</i> MLVA 3-26-13-8-523	40	7	2	A	Raw egg sauces
NSW	Nov	Restaurant	Unknown	5	0	0	D	Unknown
NSW	Nov	Restaurant	Unknown	10	0	0	D	Unknown
NSW	Nov	Restaurant	Unknown	5	0	0	D	Unknown
NSW	Nov	Restaurant	Unknown	30	0	0	D	Unknown
NSW	Nov	Restaurant	<i>S. Typhimurium</i> MLVA 3-26-17-10-523	4	4	1	D	Unknown

State or Territory	Month [†]	Setting Prepared	Agent responsible	Number affected [‡]	Number lab confirmed	Number hospitalised [‡]	Evidence	Responsible vehicles
NSW	Oct	Private residence	Histamine fish poisoning	2	0	2	D	Fish (unknown type)
NSW	Oct	Restaurant	Norovirus	39	1	0	D	Unknown
NSW	Oct	Restaurant	Unknown	14	0	1	D	Unknown
NSW	Oct	Restaurant	Unknown	5	0	0	D	Unknown
NSW	Oct	Restaurant	Unknown	13	0	0	D	Unknown
NSW	Oct	Take-away	S. Typhimurium MLVA 3-12-11-14-523	5	5	0	D	Raw egg mayonnaise
NT	Nov	Grocery store/delicatessen	Unknown	10	0	0	D	Unknown (multiple food platters purchased from national grocery chain)
NT	Oct	Fair/festival/mobile service	Unknown	7	0	0	D	Fresh fruit juice
Qld	Dec	Aged care	S. Typhimurium MLVA 05-12-10-10-490	25	18	8	D	Unknown
Qld	Dec	Bakery	S. Typhimurium MLVA 03-12-11-09-524	12	12	2	D	Pork roll, salad roll, sandwiches
Qld	Dec	Commercial caterer	S. Typhimurium MLVA 03-24-13-10-524	20	16	4	D	Pork rolls with raw egg mayonnaise
Qld	Dec	Restaurant	S. Typhimurium MLVA 03-17-09-11-524	4	3	0	D	Raw egg hollandaise sauce
Qld	Nov	Aged care	S. Virchow	22	12	1	D	Unknown
Qld	Nov	Primary produce	Ciguatera Fish Poisoning	2	0	0	D	Coral trout
Qld	Oct	Other	Campylobacter jejuni	63	20	Unknown	D	Sliced ham
Qld	Oct	Restaurant	S. Typhimurium MLVA 04-14-09-09-436	7	7	1	D	Mayonnaise
SA	Oct	Restaurant	S. Typhimurium PT 9	3	3	0	D	Unknown

State or Territory	Month [†]	Setting Prepared	Agent responsible	Number affected [‡]	Number lab confirmed	Number hospitalised [‡]	Evidence	Responsible vehicles
SA	Oct	Take-away	<i>S. Typhimurium</i> PT 135	6	6	3	D	Unknown
Tas	Oct	Primary produce	Paralytic shellfish toxin	4	Not applicable	2	D	Mussels (wild)
Vic	Dec	Restaurant	Suspected <i>Campylobacter</i> species	11	Unknown	0	A	Chicken liver parfait
Vic	Nov	Restaurant	<i>Salmonella</i> subsp I ser 4,5,12:i:-PT9	6	Unknown	3	D	Charcoal Chicken and Gravy
Vic	Nov	Restaurant	<i>Clostridium perfringens</i> enterotoxin	13	Unknown	0	A	Chicken
Vic	Nov	Restaurant	<i>Campylobacter</i> species	16	Unknown	0	A	Peking duck
Vic	Oct	Restaurant	Norovirus	11	Unknown	0	D	Possible shared antipasto platters
Vic	Oct	Restaurant	<i>Campylobacter</i> species	4	Unknown	1	D	Unknown
WA	Dec	Private residence	<i>S. Typhimurium</i> PT 9, PFGE 1, MLVA 03-26-13-11-523	8	3	1	AM	Tiramisu
WA	Nov	Commercial caterer	Unknown	61	0	1	A	Roast meat - beef and pork
WA	Nov	Restaurant	<i>S. Typhimurium</i> PT 9, PFGE 1, MLVA 03-10-(14/15/16)-11-496	14	13	4	D	Breakfast egg dishes
WA	Oct	Community	<i>S. Muenchen</i>	4	4	2	DM	Snow pea sprouts
WA	Oct	Private residence	Hepatitis A	5	5	2	D	Frozen mixed berries

[†] Month of outbreak is the month of onset of the first case or month of notification of the first case or month the investigation of the outbreak commenced.

[‡] 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. The number of people affected does not necessarily equal the number of laboratory-confirmed cases.

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 aetiological agent in the suspected vehicle and cases

MLVA Multi-locus variable number tandem repeat analysis

PFGE Pulsed-field gel electrophoresis

PT Phage type