Quarterly report

OzFoodNet quarterly report, 1 July to 30 September 2012

The OzFoodNet Working Group

Introduction

The Australian Government Department of Health established the OzFoodNet network in 2000 to collaborate nationally to investigate foodborne disease. In each Australian state and territory, OzFoodNet epidemiologists investigate outbreaks of enteric infection. OzFoodNet conducts studies on the burden of illness and coordinates national investigations into outbreaks of foodborne disease. This quarterly report documents investigations of outbreaks of gastrointestinal illness and clusters of disease potentially related to food, which occurred in Australia between 1 July and 30 September 2012.

Data were received from OzFoodNet epidemiologists in all Australian states and territories. The data in this report are provisional and subject to change, as additional outbreak data may have been collected following the collation of data for this report.

During the 3rd quarter of 2012, OzFoodNet sites reported 614 outbreaks and clusters of enteric illness, including those transmitted by contaminated food. In total, these outbreaks affected 11,560 people, of whom 268 were hospitalised. There were 49 deaths reported during these outbreaks. This compares with a 5 year mean between 2007 and 2011 of 610 outbreaks affecting 11,825 people, 275 hospitalisations and 39 deaths for the 3rd quarter. 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. The majority of outbreaks during the 3rd quarter of 2012 (86%, n=531) were due to person-to-person transmission (Table 1), with 57% (304/531) of these occurring in residential aged care facilities.

Foodborne and suspected foodborne disease outbreaks

There were 31 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as being the primary mode of transmission. These outbreaks affected 241 people, and resulted in 16 hospitalisations and 1 death. This compares with 31 outbreaks in the 2nd quarter of 2012[1] and a 5 year mean of 30 outbreaks for the 3rd quarter between 2007 and 2011.

Salmonella Typhimurium was identified as the aetiological agent in 9 outbreaks (29%) during this quarter (Table 2). Of the remaining outbreaks, 3 (10%) were due to norovirus, 2 (6%) were due to ciguatera fish poisoning, and 1 each due to scombroid poisoning, Shiga toxin-producing *Escherichia coli* (STEC), *Clostridium perfringens*, *Listeria monocytogenes,* and *Campylobacter*. In 12 outbreaks (39%), the aetiological agent was unknown.

Fifteen outbreaks (48% of foodborne or suspected foodborne outbreaks) reported in this quarter were associated with food prepared in restaurants (Table 3).

To investigate the 31 outbreaks, sites conducted 4 cohort studies, 1 case control study and collected descriptive case series data for 24 investigations. No individual patient data were collected for 2 outbreaks. The evidence used to implicate food included analytical evidence in 3 outbreaks and microbiological evidence in 3 outbreaks. Descriptive evidence alone was obtained in 25 outbreak investigations.

Table 1: Outbreaks and clusters of gastrointestinal illness reported by OzFoodNet, 1 July to 30 September 2012, by mode of transmission

Transmission mode	Number of outbreaks and clusters	Per cent of total
Foodborne and suspected foodborne	31	5
Waterborne and suspected waterborne	1	<1
Person-to-person	531	86
Unknown (*Salmonella* cluster)	7	1
Unknown (other pathogen cluster)	4	1
Unknown	40	7
Total	614	100*

* Percentages do not add up due to rounding.

Table 2: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet sites,* 1 July to 30 September 2012 (n=31)

State	Month†	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
NSW/Vic.	July	Commercially manufactured	*Listeria monocytogenes* ST 1/2a,3a, BT 58, PFGE 18A:17A:10	3	3	A	Suspected smoked salmon
NSW	July	Restaurant	Unknown	9	0	D	Unknown
NSW	August	Restaurant	Unknown	10	0	D	Mushroom sauce
NSW	August	Commercial caterer	*Salmonella* Typhimurium PT 170 / MLVA profile 03-09-08-14-523	14	0	D	Raw egg mayonnaise
NSW	August	Restaurant	Unknown	3	0	D	Unknown
NSW	August	Unknown	*S.* Typhimurium MLVA profile 03-27-08-21-496	9	0	D	Unknown
NSW	August	Restaurant	*S.* Typhimurium PT 135 / MLVA profile 03-17-09-12-523	2	0	M	Unknown
NSW	August	Aged care	*S.* Typhimurium PT 170 / MLVA profile 03-09-07-13-523	3	2	D	Unknown
NSW	August	Restaurant	Unknown	5	0	D	Unknown
NSW	September	Restaurant	Unknown	10	0	D	Unknown
NSW	September	Restaurant	Unknown	5	0	D	Unknown
NT	September	Camp	Shiga toxin-producing *Escherichia coli*	5	1	D	Kangaroo meat
Qld	July	Restaurant	Norovirus genotype II	6	0	D	Oysters
Qld	July	Restaurant	Unknown	5	0	D	Unknown
Qld	July	Private residence	Scombroid	4	0	M	Fresh mullet fillets
Qld	July	Restaurant	*Clostridium perfringens*	7	0	A	Lamb curry
Qld	August	Restaurant	*S.* Typhimurium PT 16 / MLVA profile 03-13-11-11-524	3	3	D	Chicken Caesar salad with raw egg dressing
Qld	August	Private residence	Ciguatera fish poisoning	2	0	D	Coral trout
Qld	September	Private residence	Ciguatera fish poisoning	2	0	D	Coral trout
Qld	September	Aged care	*S.* Typhimurium PT 16 / MLVA profile 03-13-10-11-524	14	0	D	Unknown
SA	July	Restaurant	*Campylobacter*	15	1	A	Chicken liver pâté
SA	July	Bakery	*S.* Typhimurium PT 9	8	3	D	Unknown
SA	September	Restaurant	*S.* Typhimurium PT 9	11	1	M	Fried ice cream made using raw eggs

Table 2 *continued*: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet sites,* 1 July to 30 September 2012 (n=31)

State	Month†	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
Tas.	July	Commercial caterer	Unknown	5	0	D	Unknown
Tas.	July	Commercial caterer	Unknown	10	0	D	Unknown
Vic.	July	Private residence	*S.* Typhimurium PT 135a	7	0	D	Chocolate mousse containing raw eggs
Vic.	August	Restaurant	Unknown	5	0	D	Unknown
Vic.	August	Unknown	Unknown	2	1	D	Unknown
Vic.	September	Restaurant	Norovirus	43	0	D	Unknown
WA	September	Bakery	Norovirus	4	1	D	Multiple foods
WA	September	Camp	Unknown	10	0	D	Unknown
Totals				241	16		

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

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

A Analytical epidemiological association between illness and 1 or more foods

BT Binary type

D Descriptive evidence implicating the suspected vehicle or suggesting foodborne transmission

M Microbiological confirmation of agent in the suspected vehicle and cases

MLVA Multi-locus variable number tandem repeat analysis

PFGE Pulsed-field gel electrophoresis

PT Phage type

ST Serotype

Table 3: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet, 1 July to 30 September 2012 by food preparation setting

Food preparation setting	Outbreaks
Restaurant	15
Private residence	4
Commercial caterer	3
Aged care	2
Bakery	2
Camp	2
Unknown	2
Commercially manufactured	1
Total	31

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

Australian Capital Territory

There were no reported outbreaks of foodborne or suspected foodborne illness during the quarter.

New South Wales

There were 10 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agent was identified in 4 outbreaks; all were due to *S.* Typhimurium. The aetiology remains unknown for the other 6 outbreaks.

Description of key outbreaks

Over an 8 week period, a cluster of cases of *S.* Typhimurium multi-locus variable number tandem repeat analysis (MLVA) profile* 03-09-08-14-523 [phage type (PT) 170] infection were notified to authorities. Nine cases reported eating a beef, egg and mustard sandwich from an event kiosk on the day before their onset of illness. Three other cases reported eating egg sandwiches or an egg salad with mayonnaise at a catered work function. The same catering company supplied food for both events. A further 2 cases reported working directly or indirectly for the catering company and had consumed the foods prepared. The New South Wales Food Authority (NSWFA) inspected the catering premises on 2 occasions and found that the sandwiches contained mayonnaise made by the caterer using raw egg and that it was possible that all the sandwiches consumed by cases contained mayonnaise from the same batch. The caterers are now using a commercial mayonnaise. No batch code details were available to enable trace-back to the farm.

Investigators identified a potential point source outbreak during a review of a cluster of salmonellosis (*S.* Typhimurium PT 135 MLVA profile 03-17-09-12-523). A group of 49 people attended a function at a restaurant where the menu was buffet style with a variety of poultry, other meat dishes and salads. Two of the 9 people interviewed became ill with nausea, vomiting, abdominal pain and diarrhoea 48 hours after consuming the meal. Both cases were confirmed as having *S.* Typhimurium (MLVA profile 03-17-09-12-523) but otherwise did not know each other. The NSWFA conducted an inspection of the premises and did not identify any problems. NSWFA attempted to trace back to the chicken suppliers; however this did not yield any extra information. See also *Cluster investigations*.

Northern Territory

There was one reported outbreak of foodborne or suspected foodborne illness during the quarter.

A group of 7 people from a remote Indigenous community all ate kangaroo that was killed, cooked and eaten in a bush setting.[3] Five of the group experienced diarrhoea and vomiting, with three suffering from bloody diarrhoea and subsequently required hospital attention. One patient was admitted to hospital. Stool samples were taken from the 3 cases with bloody diarrhoea and 1 case tested positive for the *stx*$_2$ toxin gene produced by STEC. Multiplex polymerase chain reaction testing confirmed this result. No food samples were collected for testing.

Queensland

There were 8 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agent was identified in seven of these outbreaks: two each were due to *S.* Typhimurium and ciguatera fish poisoning; and one each due to *C. perfringens,* norovirus and scombroid fish poisoning.

Description of key outbreaks

Seven of a group of 12 people who shared a common meal at a restaurant developed diarrhoea and stomach cramps between 3 and 15 hours following a meal that included lamb curry, chicken, beef rendang, and pork. Food samples and environmental swabs from the restaurant kitchen tested negative for bacterial pathogens. A retrospective cohort study identified that persons who consumed lamb curry had an elevated risk of illness [relative risk (RR) 3.0;

* MLVA profiles are reported using the Australian coding convention agreed at a MLVA typing harmonisation meeting in Sydney in November 2011.[2]

95% confidence interval (CI) 1.0 to 9.3; $P=0.06$]. Four stool samples were positive for *C. perfringens* with vegetative cell counts ranging between 3.8×10^5 and 5.7×10^7 cells/g and faecal spore counts ranging between 2.1×10^6 and 3.9×10^7 spores/g. *C. perfringens* isolates were confirmed as Type A, but the *C. perfringens* enterotoxin gene was not detected. Control measures included thorough cleaning of the restaurant and advice to improve handling and temperature monitoring of cooked foods.

Fourteen residents of an aged care facility experienced illness with symptoms including diarrhoea, vomiting, stomach cramps and fever. *S.* Typhimurium PT 16 (MLVA profile 03-13-10-11-524) was isolated from the stools of 8 residents. No hospitalisations were reported. A wide variety of food items were consumed in the week prior to illness (including vitamised meals). Extensive environmental samples were collected for microbiological testing as well as food samples including eggs. All samples tested negative for *Salmonella*. Investigators were unable to identify a food vehicle or source of infection. The MLVA profile and phage types of case isolates suggests that this outbreak may have had a common source of infection with another outbreak investigated during the quarter in which 3 cases of salmonellosis (*S.* Typhimurium PT 16 MLVA profile 03-13-11-11-524) all consumed Caesar salad. This was prepared using a raw egg dressing at a sporting club restaurant. No common exposures between the 2 outbreaks were found.

South Australia

There were 3 outbreaks of foodborne or suspected foodborne illness investigated during the quarter. The aetiological agents were identified as *S.* Typhimurium PT 9 for 2 outbreaks and *Campylobacter* for the remaining outbreak.

An outbreak of *Campylobacter* occurred following a private function in a commercial restaurant. A retrospective cohort study was conducted amongst the 57 party guests.[4] All of the guests completed the questionnaire, 15 of whom met the case definition. Analysis of the data showed a significant association between illness and the consumption of a chicken liver pâté (RR 16.7; 95% CI 2.4 to 118.6; $P<0.001$). No other food or beverage served at the party was associated with illness. Three guests submitted stool samples, all tested positive for *Campylobacter* and one was further identified as *Campylobacter jejuni*. The environmental investigation noted that the cooking process used in the preparation of chicken liver pâté may have resulted in some portions not being cooked adequately to inactivate potential *Campylobacter* contamination.

Investigators identified an outbreak of *S.* Typhimurium PT 9 after 11 cases of gastrointestinal illness were found to be associated with dining at or receiving takeaway food from a particular restaurant. All 11 cases had consumed fried ice cream at the restaurant. Nine of 11 cases submitted faecal samples and all 9 were confirmed as having *S.* Typhimurium PT 9 infection. An environmental investigation was conducted and *S.* Typhimurium PT 9 was identified from the breadcrumb plate used to prepare the fried ice cream. Ice cream with raw egg coating was rolled in these breadcrumbs.

Tasmania

There were 2 reported outbreaks of foodborne or suspected foodborne illness during the quarter affecting a total of 15 people. The outbreaks were clustered and were linked to the same catering company but no pathogen could be identified.

Victoria

There were 4 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agent was identified for two of these outbreaks with one each due to *S.* Typhimurium and norovirus.

Investigators were notified of an outbreak of salmonellosis in a family who became ill after sharing a meal that consisted of roast beef, vegetables and chocolate mousse containing raw eggs. All 7 attendees ate the mousse and all became ill approximately 24 hours later. The mousse contained free range eggs. There were no leftover eggs for testing and no batch code details were available to enable trace back to the farm.

An outbreak of gastroenteritis affecting 6 people from a group of 12 who dined at a hotel was reported to a council in regional Victoria. Authorities received a second complaint of illness affecting a large group of 38 people who had dined at the same hotel restaurant a week later. In total, 7 separate groups reported illness after dining at the hotel. Sixty-two interviews were conducted with 3 affected groups and food handlers, and 43 people were identified as cases. Illness was not associated with the consumption of any specific food or drink items. Eight food handlers were interviewed and 6 reported having a gastrointestinal illness but stated that they remained away from work for the recommended time. However, 1 food handler became ill whilst at work and is known to have prepared some food just prior to his illness onset. This food was then served over subsequent days. One faecal sample was submitted by a case and was positive for norovirus. Despite being unable to definitively identify the mode of

transmission for this cluster of related outbreaks, the incubation period for each of the affected groups and the high attack rate (74%) for the large group of 38 suggests that cases were exposed to a common source such as food that may have been intermittently contaminated by an infectious food handler or a contaminated environment. Findings that support this hypothesis include the absence of adequate handwashing facilities in the kitchen, and no documented clean up after the first outbreak.

Western Australia

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

An increase in gastroenteritis in a rural town was reported by hospital staff. Of the 17 people investigated, 12 were from the community and 5 were relatives of a food business owner. Of the 12 community cases, 9 were interviewed and all reported diarrhoea and/or vomiting. Four of these 9 cases had reported eating a range of food items from a food business prior to illness, including bread rolls containing salad (n=3) and a meat pie (n=1). None of the 4 community cases reported contact with an ill person prior to their illness. The median incubation period was 30 hours (range 20–40 hours) and the median duration of diarrhoea was 24 hours. Two cases had faecal specimens positive for norovirus, including one who had eaten food from the food business. Of the 5 ill relatives of the food business proprietor, three presented at hospital with diarrhoea and/or vomiting and at least one of the five was an employee at the implicated food business. The food business owner was given advice on cleaning and sanitising the food preparation areas and exclusion of ill workers. The evidence suggested that illness was due to norovirus and the 4 community cases had suspected foodborne illness due to an ill food handler preparing food. However, as norovirus was also circulating in the community at the time, it is possible that the 4 cases who ate food from the implicated food business may have acquired their illness via person-to-person transmission.

Cross-jurisdictional investigation

Through its National Enhanced Listeriosis Surveillance System (NELSS), OzFoodNet identified an outbreak of suspected foodborne illness involving 3 cases of *Listeria monocytogenes* serotype (ST) 1/2a,3a, binary type (BT) 58, pulsed-field gel electrophoresis (PFGE) pattern 18A:17A:10. NELSS commenced in January 2010 and contained no record of this strain being previously isolated from humans. Cases occurred in January (New South Wales), late May (Victoria) and early June (Victoria). One case died. A case–case analysis using data from NELSS involved 3 cases and 56 controls. In univariate analysis, only smoked salmon had a statistically significant association between consumption and illness; however, as all 3 cases consumed smoked salmon in the 28 days prior to illness onset, an odds ratio (OR) could not be calculated (OR undefined; 95% CI 2.2 to undefined; $P=0.02$). All 3 cases consumed the same brand of smoked salmon but 2 of the cases also consumed other brands of smoked salmon. The Microbiological Diagnostic Unit at the University of Melbourne has maintained PFGE typing data of *Listeria* isolates collected from environmental and food samples since 1995. While the dataset is not complete and does not contain a systematic record of food testing, there was no historical laboratory evidence of *L. monocytogenes* ST 1/2a,3a, BT 58, PFGE 18A:17A:10 in smoked salmon.

Health authorities met with the company of interest and concluded that it had an extensive program for *Listeria* identification and control in place. The company's test and hold criteria for fish products exceeded the current microbiological requirements of the Australia New Zealand Food Standards Code.[5] Twenty samples of ready-to-eat cold smoked salmon of varying brands, batches and date coding sampled from retail sites were all negative for *Listeria*.

Cluster investigations

During the quarter, OzFoodNet sites investigated multiple clusters of illness due to a range of pathogens, with five being due to *S.* Typhimurium, two due to other *Salmonella* serotypes, and one each due to *Campylobacter*, *Cryptosporidium*, *Giardia* and *Yersinia enterocolitica*. No particular source or transmission mode could be identified in the clusters.

An investigation into a *S.* Typhimurium cluster with a novel MLVA profile of 03-17-09-12-523 was commenced in New South Wales in July. Phage typing of clinical samples from the cluster identified the organism as *S.* Typhimurium PT 135. Sixty-nine cases were reported in the quarter, with a total of 41 cases interviewed using a hypothesis generating questionnaire. A trawling questionnaire was completed for 35 cases. Place of residence for cases varied across New South Wales. Frequently consumed foods for cases included fresh pre-cut chicken (88%), fresh beef cuts (60%), carrots (71%), cooked onions (63%), apples (63%) and bananas (57%). Fresh chicken purchased from large supermarket retailers was a feature of the cluster. The NSWFA conducted a trace back investigation based on place of purchase information provided

by cases, and identified 3 predominant chicken suppliers. NSWFA approached the 3 suppliers, and one supplier noted that they had seen the same phage type in samples collected during the year and supplied the isolates for MLVA typing. These isolates were found to have the same MLVA pattern as the clinical isolates (MLVA profile 03-17-09-12-523). The supplier subsequently introduced a series of changes in the production process and the number of new cases decreased. One outbreak was identified as a result of this cluster investigation (reported above and in Table 2).

Comments

The majority of reported outbreaks of gastrointestinal illness in Australia are due to person-to-person transmission, and in this quarter, 86% of outbreaks (531/614) were transmitted via this route. The number of foodborne outbreaks this quarter (n=31) was the same as the previous quarter and consistent with the 5-year mean (2007–2011) of 30 outbreaks. *S.* Typhimurium was identified as the aetiological agent in 9 (29%) of the foodborne or suspected foodborne outbreaks during this quarter (Table 2). In fact, all (9/9) outbreaks with known *Salmonella* aetiology were due to this serotype. Of the 9 outbreaks where *Salmonella* was implicated as the responsible agent, 44% (4/9) were associated with raw or undercooked egg products (including raw egg dressings, raw/undercooked egg dessert and fried ice cream).

NELSS was established in 2010 in response to a *L. monocytogenes* outbreak affecting both an airline and catering company in 2009.[6,7] The surveillance scheme involves serotyping, binary typing and further molecular characterisation, including PFGE, of all clinical isolates of *L. monocytogenes*. An exposure history for each case is also recorded where available. In this quarter, NELSS allowed the identification of a small *Listeria* outbreak with just 3 cases in 2 jurisdictions with consumption of a smoked salmon brand common to all cases, indicating that the surveillance system is sensitive.

A limitation of the outbreak data provided by OzFoodNet sites for this report was the potential for differences in how investigators interpreted circumstances and classified and categorised features of the outbreaks. Changes in the number of foodborne outbreaks should be interpreted with caution due to the small number each quarter.

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