

Quarterly reports

OzFoodNet QUARTERLY REPORT, 1 OCTOBER TO 31 DECEMBER 2009

The OzFoodNet Working Group

Introduction

The Australian Government Department of Health and Ageing established OzFoodNet in 2000 to collaborate nationally to investigate foodborne disease. OzFoodNet conducts studies on the burden of illness, co-ordinates national investigations into outbreaks of foodborne disease, develops nationally standardised protocols and tools for surveillance, identifies foods or commodities that may cause human illness and trains people to investigate foodborne illness. This quarterly report documents investigation of outbreaks of gastrointestinal illness and clusters of disease potentially related to food, occurring in Australia from 1 October to 31 December 2009.

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 4th quarter of 2009, OzFoodNet sites reported 622 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 illness. In total, these outbreaks affected 13,013 people, of whom 372 were hospitalised. There were 33 deaths reported during these outbreaks. The majority of outbreaks (87%, n=541) were due to person-to-person transmission (Table 1).

Foodborne and suspected foodborne disease outbreaks

There were 42 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as the primary mode of transmission (Table 2). These outbreaks affected 741 people and resulted in 48 hospitalisations. There were 2 reported deaths during these outbreaks. This compares with 31 outbreaks for the 4th quarter of 2008¹ and 28 foodborne outbreaks for the 3rd quarter of 2009.² In addition to these newly reported outbreaks, in a continuing multi-jurisdictional outbreak of hepatitis A,³ there were 193 cases of locally-acquired hep-

Table 1: Mode of transmission for outbreaks of gastrointestinal illness reported by OzFoodNet, 1 October to 31 December 2009

Transmission mode	Number of outbreaks	Percent of total
Foodborne and suspected foodborne	42	7
Person-to-person	541	87
<i>Salmonella</i> cluster	5	1
Suspected waterborne	2	<1
Unknown	32	5
Total	622	100

titis A notified in Australia this quarter.* Included amongst these were 18 cases that are reported as 3 small foodborne outbreaks in single jurisdictions, which are included in outbreaks for this quarter.

Salmonella was the aetiological agent for 11 outbreaks during this quarter, with *S. Typhimurium* being the most common serotype (n=9). Of the remaining 31 outbreaks, 13 were due to norovirus, three to hepatitis A, two to *Clostridium perfringens*, two to *Escherichia coli*, and one each to *Campylobacter* and fish wax esters (or escolar). For 9 outbreaks, the aetiological agent was unknown or not specified.

Twenty outbreaks (48%) reported in this quarter were associated with food prepared in restaurants, four (10%) were associated with aged care facilities, four (10%) with private residences, three each (7%) were associated with commercial caterers and commercially manufactured food. Two outbreaks (5%) were associated with foods prepared in a military institution, two (5%) with foods prepared in a takeaway and two (5%) with camps. One outbreak (2%) was associated with a fair/festival or mobile service, and one (2%) with primary produce.

To investigate these outbreaks, sites conducted 14 cohort studies, 3 case-control studies, and col-

* This outbreak is considered to be a continuation of a previously reported outbreak and as such is not included in Table 2.

Table 2: Outbreaks of foodborne disease reported by OzFoodNet sites,* 1 October to 31 December 2009 (n=42)

State	Month of outbreak	Setting prepared	Agent	Number affected	Hospitalised	Evidence	Responsible vehicles
NSW	Oct	Commercially manufactured	S. Typhimurium 170	4	0	M	Layered chocolate cake (no raw eggs used)
	Oct	Fair/festival/mobile service	Unknown	3	1	D	Unknown, possibly prawns or calamari
	Oct	Private residence	Unknown	8	0	D	Unknown
	Oct	Restaurant	Unknown	4	0	D	Unknown
	Oct	Restaurant	Unknown	4	0	D	Unknown, possibly salad items
	Nov	Commercially manufactured	Unknown	28	0	D	Unknown
	Nov	Private residence	S. Typhimurium 135	6	2	D	Unknown, probably tiramisu prepared with raw eggs
	Nov	Restaurant	S. Typhimurium	3	0	M	Cooked pork mince and leftover food (mix of tofu, rice, duck)
	Nov	Restaurant	Unknown	7	0	D	Unknown
	Dec	Restaurant	S. Singapore	3	0	M	Fried ice cream prepared with raw eggs, omelette
	Dec	Takeaway	Norovirus	30	0	D	Unknown
	Dec	Takeaway	S. Stanley	32	6	D	Unknown
	NT	Dec	Restaurant	Unknown	999	0	D
Dec		Restaurant	Norovirus	999	0	D	Unknown
Qld	Oct	Restaurant	Norovirus	3	0	D	Unknown
	Oct	Restaurant	Norovirus	23	0	A	Chicken Caesar salad; roast chicken
	Dec	Restaurant	C. perfringens	2	0	D	Unknown
SA	Nov	Camp	E. coli O157	31	5	A	Potato salad
	Nov	Restaurant	Norovirus	21	0	A	Berry cheesecake
	Dec	Private residence	S. Typhimurium 44	16	2	A	Tiramisu
Tas	Nov	Commercial caterer	Norovirus	14	0	A	Green salad suspected
Vic	Oct	Commercial caterer	Unknown	41	0	D	Unknown
	Nov	Aged care facility	C. perfringens	4	0	D	Unknown
	Nov	Aged care facility	Unknown	6	0	D	Unknown
	Nov	Aged care facility	S. Typhimurium 170	22	5	D	Unknown
	Nov	Aged care facility	S. Typhimurium 170	20	2	D	Unknown
	Nov	Primary produce	Fish wax ester	27	0	D	Escalor/rudderfish
	Nov	Private residence	S. Typhimurium 3	6	3	D	Suspect eggs
	Nov	Restaurant	Norovirus	165	(blank)	D	Unknown
	Nov	Restaurant	Unknown	17	0	D	Unknown

Table 2: Outbreaks of foodborne disease reported by OzFoodNet sites,* 1 October to 31 December 2009 (n=42), continued

State	Month of outbreak	Setting prepared	Agent	Number affected	Hospitalised	Evidence	Responsible vehicles
Vic, cont	Dec	Military institution	<i>Campylobacter</i>	5	Unknown	D	Unknown
	Dec	Military institution	Norovirus	18	1	D	Unknown
	Dec	Restaurant	Hepatitis A	3	1	D	Infectious food handler suspected
	Dec	Restaurant	Hepatitis A	6	2	D	Infectious food handler suspected
WA	Oct	Restaurant	<i>S. Typhimurium</i> 170	39	6	D	Raw egg mayonnaise
	Oct	Restaurant	<i>S. Typhimurium</i> 170	39	7	A	Scrambled eggs
	Nov	Commercial caterer	Norovirus	8	0	D	Unknown
	Nov	Commercially manufactured	Hepatitis A	9	5	M	Semi-dried tomatoes
	Dec	Camp	Norovirus	14	0	D	Unknown
	Dec	Restaurant	Norovirus	11	0	D	Unknown
	Dec	Restaurant	Norovirus	17	0	D	Unknown
	Dec	Restaurant	Norovirus	22	0	D	Unknown

* No foodborne outbreaks were reported by the Australian Capital Territory during the quarter.

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.

The month of outbreak represents the month of onset of outbreak. The hepatitis A multi-jurisdictional outbreak was re-opened in November but some cases had dates of onset during this quarter.

lected descriptive case series data for 25 investigations. As evidence for the implicated food vehicle, investigators relied on microbiological evidence in 4 outbreaks and analytical epidemiological evidence in 6 outbreaks. Descriptive evidence only was obtained in 32 outbreaks.

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

Australian Capital Territory

There were no outbreaks of foodborne disease investigated in the Australian Capital Territory during the 4th quarter.

New South Wales

New South Wales investigated 12 outbreaks of foodborne or suspected foodborne disease during the quarter. Three outbreaks were due to *S. Typhimurium* (phage types 170, 135 and pending), one to *S. Singapore*, one to *S. Stanley*, and one to norovirus. The aetiological agent in 6 outbreaks was unknown, and these outbreaks are not detailed here.

In October, 4 people amongst a group of six developed diarrhoea, fever, and severe abdominal cramps after consuming a layered chocolate cake, prepared with cream and ganache icing (no raw eggs were used). Two other people in the group who did not consume the cake remained well. One stool sample and leftover cake were positive for *S. Typhimurium* 170 (MLVA type 3-9-8-13-523).

In November, 3 people became ill after sharing a meal at a Chinese restaurant. An inspection of the premises identified inadequate disinfection and sanitation, insufficient cooking and insufficient reheating practices. Two stool samples and samples of cooked pork mince and left-over food (duck, tofu and rice) were positive for *S. Typhimurium* MLVA type 3-12-12-13-523 (phage type pending).

In December, it was reported that 30 people of a group of 40 became ill after attending a self-catered Christmas function held at a tennis club. Foods consumed at the function included pork, ham, beef and prawns purchased from a large supermarket, and Caesar, pasta, seafood and coleslaw salads from a takeaway outlet. One-third of stool samples collected were positive for norovirus. The local council inspected the premises and found inadequate storage of foods and inadequate hand washing facilities.

A cluster of 3 cases of *S. Typhimurium* 135 (MLVA 3-13-9-11-550) was identified through routine surveillance. Through interviews, it was revealed that cases had recently attended the same function, where

2 cases reported eating tiramisu prepared at home by one of the 10 to 12 people at the function. The tiramisu contained raw eggs. The 3rd case would not say whether she had consumed the tiramisu. One of the interviewees stated that 5–7 people at the function became ill. The mother of one of the cases did not attend the function but consumed some of the tiramisu and also became ill. The eggs used for making the tiramisu were bought at one of 2 major supermarkets, and the person preparing the tiramisu could not remember the brand.

The investigation of a cluster of 3 cases of *S. Singapore* was identified through routine surveillance. Interviews revealed that cases had common exposure to a variety of foods from a large buffet-style restaurant. *S. Singapore* was isolated from a sample of uncooked fried ice cream with raw egg used to bind the breadcrumb coating to the ice cream. Two of 3 cases had consumed the fried ice cream. The 3rd case reported consuming an omelette from the premises. The eggs were traced back to a farm previously implicated in an outbreak of *S. Singapore*.

In December, a sudden increase in the number of notifications of *S. Stanley* was investigated amongst people aged between 20 and 30 years of age, who were living or staying in Sydney's eastern suburbs. Of a total of 34 cases, 16 reported consuming a number of food products from a takeaway food premises in Bondi Beach, including salads, wraps and burgers. Seven people reported either eating commercially prepared food items from other venues at Bondi/Bondi Beach, or working or residing in that area and 11 either acquired their infection overseas, or were overseas travellers themselves with no contact details. Investigations at the takeaway premise linked to 16 cases, revealed that mayonnaise and sauces (ingredients common to most food items implicated by cases) were commercially prepared without raw egg. Stool specimens from 2 food handlers at the takeaway were positive for *S. Stanley*, although neither reported being symptomatic. MLVA typing identified an outbreak MLVA profile 2-15(14)-0-0-496, which was distinct to the profile from *S. Stanley* isolates from overseas travellers. The source of the outbreak remains unclear.

Northern Territory

Two outbreaks of foodborne illness were investigated during this quarter in the Northern Territory, both in December.

In the 1st outbreak, 13 cases of norovirus were investigated amongst people who had attended a corporate event, with buffet-style catering provided by a local restaurant. The outbreak was notified 12 days after the event, making investigations difficult. It is suspected that the outbreak was due to

norovirus, with food handler or patron contamination of the buffet-style foods likely to have been a contributing factor.

In the 2nd outbreak, 7 cases of gastrointestinal illness occurred amongst 3 separate groups after consuming a meal at a local restaurant. An environmental investigation identified several areas for improvement within the food business and the food business was voluntarily closed. *Escherichia coli* (4,000 CFU/g) and coliforms (77,000 CFU/g) were isolated from food samples. The illness was consistent with *Bacillus cereus* or *Staphylococcus aureus* intoxication, although all stool samples were negative for pathogens and toxins.

Queensland

Three outbreaks of foodborne or suspected foodborne illness were investigated during the quarter in Queensland.

In October, an outbreak of norovirus affected 23 of 60 guests at a wedding reception on the Sunshine Coast. Cases became ill between 8 and 73 hours (median 31 hours) following an evening meal. Two foods were associated with illness; Caesar salad (RR=1.5, 95% CI 1.12–2.02) and roast chicken (RR=1.5, 95% CI 1.04–2.06). Microbiological testing of several food samples supported the epidemiological findings with chicken and cos lettuce found to be of unsatisfactory bacterial quality. The outbreak was suspected to have been transmitted from an infected person to food-to-person transmission although there were no reported cases of illness among staff members prior to the reception.

In October, 3 people became ill with symptoms including diarrhoea, vomiting and fever after a meal at a Brisbane restaurant. No food vehicle was identified, but a number of food handlers had been recently ill with gastrointestinal symptoms. Norovirus was detected in faecal specimens from two of the 3 cases.

In December, 2 women became ill with diarrhoea and abdominal cramps approximately 10 hours after consuming a meal at a wedding, with *C. perfringens* (vegetative cell count 2.5×10^5 org/g) detected in 1 of 2 faecal specimens. There were no other reports of illness among the attendees. The meal consumed included curried rice and tofu curry. No leftover food samples were available for microbiological testing.

South Australia

Three outbreaks of foodborne or suspected foodborne illness were investigated in South Australia during the quarter.

In November, the Communicable Disease Control Branch investigated an outbreak of 31 cases of gastroenteritis in attendees at a 4 day church camp. Six of these were confirmed to have been infected with Shiga toxin-producing *E. coli* (STEC). Environmental investigation at the camp site found no environmental sources of STEC. No food from the camp was available for testing. A cohort study of 240 camp attendees found that eating potato or pasta salad at the camp increased the risk of illness. The only common ingredient in the 2 salads was parsley and the source of the parsley is unknown.

In November, the Communicable Disease Control Branch investigated an outbreak of gastroenteritis in diners at a hotel restaurant. Initial reports indicated that members of at least 2 unrelated groups of diners became ill with gastroenteritis approximately 24 hours after a meal at the restaurant. A cohort study was conducted to investigate the outbreak, and included 77 of 125 diners that could be contacted. Five people tested positive for norovirus, with a total of 25 people reporting illness after consumption of food at the restaurant. Illness was associated with consumption of berry cheesecake (RR 2.5, 95% CI 1.3–4.9). The restaurant was provided with education regarding the exclusion of ill food handlers and requested to address issues with refrigeration temperatures.

In December, an outbreak of gastroenteritis was reported amongst 16 of 27 attendees at a function held at a private residence. Six cases were confirmed to be infected with *S. Typhimurium* 44. A cohort study of all 27 attendees found a strong association between consumption of tiramisu and illness (95% CI 1.7–12.7). The tiramisu contained raw eggs sourced from the host's backyard chickens. Environmental investigation found the chicken coop was not regularly cleaned and eggs were not washed prior to use. Samples of chicken faeces tested positive for *S. Typhimurium* 44. No tiramisu was available for testing, however samples of leftover pavlova and cream (store-bought then dressed by the same person who made the tiramisu) tested positive for *S. Typhimurium* 44. The pavlova was not associated with illness (RR 1.1, 95% CI 0.6–2.1, *P*-value 0.701).

Tasmania

Tasmania investigated one foodborne outbreak during the quarter.

In November, 14 of 40 people reported gastrointestinal illness after attending a catered function. Norovirus was detected in the faecal specimen of 1 case. A cohort investigation involving 38 of the 40 people who had attended the function indicated point source transmission. Analysis revealed a green

salad to be the most likely vehicle of transmission with those who consumed the salad being at least twice as likely to develop symptoms as those who did not consume the salad. A possible explanation is that the food handler directly contaminated the salad during preparation prior to consumption. While the food handler was not symptomatic when the salad was prepared she had been caring for her partner and infant daughter, both of whom were ill with vomiting and diarrhoea in the days preceding the function

Victoria

Victoria investigated 13 foodborne or suspected foodborne outbreaks during the quarter.

In October, an unidentified outbreak caused symptoms of vomiting and diarrhoea amongst a group of people after they attended a wedding. Sixty-five guests were interviewed and 41 people suffered vomiting and/or diarrhoea with a median incubation period of 40 hours after consumption of food at the reception. A cohort study was conducted but no foods were significantly associated with illness. The pattern of illness suggested a viral aetiology and the high attack rate suggested that food was the vehicle of transmission.

In November, 2 separate outbreaks of *S. Typhimurium* 170 were investigated in 2 separate aged care facilities. The 1st affected 22 of the 71 residents at the facility with onsets occurring over a 2 week period. The 2nd affected 20 of the 60 residents with onsets occurring over a 13 day period. Investigators were unable to identify a food source for either outbreak despite intensive investigations, however, in both instances the spread of onsets of illness over a 2 week period were suggestive of ongoing low dose contamination of foods and/or kitchen equipment.

An outbreak affecting 4 residents of a small aged care facility was investigated in November. Cases' symptoms were consistent with *C. perfringens* and faecal specimens for two of the cases were positive for *C. perfringens* enterotoxin. Three cases became ill on the same day, with a 4th case becoming symptomatic 2 days later. Investigators were unable to identify a food vehicle for this outbreak.

An outbreak of gastrointestinal illness was reported amongst a group of 25 people who shared a meal at a private residence in November. The meal consisted of chicken and rice, a stir fried noodle and prawn dish, a garden salad and a bread pudding. The prawn and noodle dish had raw eggs added to it at the end, and it is suspected that the eggs were inadequately cooked. Six guests submitted faecal specimens, all of which were positive for *S. Typhimurium* 3.

In November, 6 residents from a 30-bed aged care facility became ill with diarrhoea within 12 hours of each other, and symptoms resolved within 24 hours. Lamb chops and roast beef were 2 foods that all cases had in common. No faecal specimens were collected but *C. perfringens* was suspected.

Within 24 hours after attending a function in November, 28 people suffered yellow, oily diarrhoea and nausea after consuming a meal of 'butterfish'. Investigators confirmed that the fish was escolar, which has been previously associated with these symptoms.

In November, an outbreak of vomiting and diarrhoea occurred in approximately 25 people of a group of 106 people who attended a function at a restaurant. Two food handlers reported gastrointestinal illness prior to the event, one of whom returned to work within 48 hours after symptoms resolved. The aetiology of this outbreak was unable to be confirmed but it is suspected to have been viral transmitted via contaminated food.

In November, an outbreak of gastroenteritis was reported amongst a large group of 260 people who attended a function at a restaurant with a set menu. The reported attack rate was approximately 60%. One case had norovirus detected in a faecal specimen and 2 secondary cases were reported amongst family members who did not attend the function. Gastrointestinal illness was also reported in a 2nd group of 24 people who dined at the same restaurant complex the following evening, with nine of the 19 who were interviewed reporting symptoms. While data from interviews were suggestive that a seafood entrée may have been the food vehicle, investigators were unable to make any firm conclusions. There was no reported illness amongst staff.

Two separate outbreaks of hepatitis A associated with 2 separate restaurants were investigated this quarter. In the outbreak at the 1st restaurant, 3 cases developed symptoms within 4 days of each other and are likely to have acquired their illness through consumption of semi-dried tomatoes. One of these cases was a food handler at the restaurant. A further 6 cases who had eaten at this restaurant during their incubation period were subsequently identified. These cases had onsets between three and 5 weeks later. The source may have been food contaminated by the infected food handler, foods cross-contaminated by contaminated semi-dried tomatoes or direct consumption of contaminated semi-dried tomatoes. There was also a case in the 2nd outbreak who was a food handler at a restaurant to which 4 cases were subsequently linked. These 4 cases had onsets approximately 3–5 weeks after the food handler. Again, it cannot be certain

what the source for these cases may have been as there are various possibilities (see also the section on multi-jurisdictional outbreak investigations).

Two separate outbreaks were reported at the same military barracks in December. The 1st was an outbreak of *Campylobacter*, with 5 confirmed cases having onsets over an 8 day period. Only 1 case was interviewed and the source of illness could not be identified. The 2nd outbreak occurred approximately 2 weeks later and was confirmed as norovirus. The outbreak affected 18 military personnel and all had an onset of gastroenteritis on the same day. Only staff that ate at the same mess became unwell and those that went home remained well. It is suspected that this was a foodborne norovirus outbreak.

Western Australia

Western Australia investigated 8 foodborne and suspected foodborne disease outbreaks during the quarter.

An outbreak of *S. Typhimurium* 170 (pulsed field gel electrophoresis [PFGE] type 0011) amongst patrons of a hamburger takeaway restaurant was investigated in October. Follow-up of complaints received and interviews with notified cases of infection revealed that 39 cases with gastroenteritis had eaten food from a hamburger takeaway, and 21 were laboratory-confirmed. Cases had eaten a variety of burgers and 10 had also eaten aioli with hot chips. The aioli and a mayonnaise used in the burgers were made using raw egg. Food samples and swabs including mayonnaise (not the same batch as eaten) and eggs were negative for *Salmonella*. Eggs used in the restaurant were traced to a Western Australia egg producer, but eggs and drag swabs obtained from the farm were negative for *Salmonella*. The restaurant began using pasteurised egg in aioli and mayonnaise in response to this outbreak.

In October, a 2nd outbreak of *S. Typhimurium* 170 (PFGE type 0011) was investigated amongst patrons of a metropolitan restaurant, with 39 cases of gastroenteritis. Of these 39 cases, 27 were confirmed to have been infected with the outbreak strain. A case control study conducted to investigate the outbreak found an association between illness and eating scrambled eggs. Investigations revealed that raw eggs were routinely added to the scrambled eggs before serving. An aioli served at the restaurant and eaten by a small number of cases was also prepared with raw eggs. Food samples including aioli (from a different batch to that eaten by cases) and eggs, and swabs taken from the restaurant were negative for *Salmonella*. Trace back revealed that eggs used in the restaurant were sourced from the same Western Australian producer as those used by the hamburger

takeaway restaurant involved in an outbreak in the same month (as described above). The restaurant stopped adding raw eggs to the scrambled eggs prior to serving and changed to a different egg supplier in response to this outbreak.

In November, eight of 11 people became ill with gastroenteritis after attending a private lunch function catered by 2 food businesses. Two cases were diagnosed with norovirus. There were no reports of illness among the cases prior to the lunch. Food served at the function included sandwiches, foccacia, meatballs and roast chicken. No ill food handlers were reported. One of the food businesses had supplied food to another group of people on the same day, and people from this group also developed gastroenteritis. A cohort study was unable to identify a food vehicle, but the outbreak was considered foodborne because an offsite food business prepared the meals and illness occurred amongst 2 separate groups making person-to-person spread unlikely.

From October to December 2009, eight of 9 cases of hepatitis A in Western Australia were epidemiologically linked a brand of semi-dried tomatoes that was previously shown to be contaminated with hepatitis A virus. These cases reported either eating a particular brand of semi-dried tomatoes, or eating at one of 2 food outlets at a large entertainment complex where this same brand of semi-dried tomatoes was served in a variety of dishes. Six of these cases were confirmed to have been infected with the genotype (1B) that has been reported amongst cases in the concurrent multi-jurisdictional outbreak (see also the section on multi-jurisdictional outbreaks).

In December, 3 separate norovirus outbreaks were investigated amongst people who dined at 3 different restaurants. In the first, 22 people became ill with gastrointestinal symptoms following meals at a Thai restaurant. The 2nd was amongst eight from a group of 22 people who reported gastrointestinal illness following a lunch from a set menu at a café with 3 staff also reporting illness, but after the group had dined there. The 3rd outbreak affected 18 people from 4 separate groups who had buffet meals from the same restaurant. In each of these 3 outbreaks, investigators were unable to identify a specific food, but foodborne transmission was suspected in the absence of evidence of person-to-person transmission.

In December, 12 of 25 people camping in dormitory style accommodation reported gastroenteritis. There was no reported illness amongst staff responsible for catering in the days prior to the group's stay, but 2 staff members (not food handlers) did report illness at the same time as the campers. Investigators were unable to identify a specific food

vehicle, but foodborne transmission was suspected in the absence of evidence of person-to-person transmission.

Multi-jurisdictional outbreak investigations

Hepatitis A

In late June 2009, Victoria reported a marked increase in locally-acquired cases of hepatitis A. There were also a small number of cases in other jurisdictions. The number of cases in Victoria and other jurisdictions continued to increase and the multi-jurisdictional outbreak investigation was re-opened on 2 November. This was a second wave of cases following an earlier multi-jurisdictional outbreak associated with semi-dried tomatoes in May 2009.^{†2} Genotyping of isolates in Victoria showed that the outbreak strain from the 2nd wave of cases was identical to that in the 1st wave. All jurisdictions were asked to follow-up locally-acquired cases and request genotyping on all isolates to determine whether they matched the outbreak strain.

During the quarter, there were 193 locally-acquired cases of hepatitis A in Australia. These cases were reported from Victoria (150), New South Wales (12), Queensland (10), Western Australia (10) South Australia (7), Tasmania (3) and the Australian Capital Territory (1). Of these locally-acquired cases, 52% (100/193) recalled eating semi-dried tomatoes during the period when they were likely to have been exposed. The 2nd wave of the outbreak appears to have peaked in October, with the number of new cases reported decreasing since mid-November 2009. A univariate analysis of data from a case-control study conducted in Victoria to investigate the 2nd wave of the outbreak, showed a significant association between consumption of semi-dried tomatoes and illness with hepatitis A (OR=10.32; 95% CI 4.7–22.7).

Trace back in Victoria of semi-dried tomatoes consumed by cases has revealed a complicated supply chain with multiple suppliers to multiple brands and imported product may be mixed or re-packaged for sale. However, trace back investigations were suggestive of a link to imported frozen tomatoes, from which the final product was manufactured locally. The manufacturer of 1 brand of semi-dried tomatoes that is made from imported product, conducted a voluntary trade-level recall of the product on 30 October 2009, following detection of hepatitis A genomic material in the undressed product. Evidence linking this product to cases was not conclusive for all cases.

† This outbreak is considered a continuation of an earlier outbreak it is not included in Table 2.

The Chief Health Officer of Victoria issued emergency orders mandating pasteurisation or chlorine washing of tomatoes used in the manufacture of semi-dried tomatoes, and measures to improve traceability of all ingredients used in the product. These emergency orders expired in January 2010. Victoria, New South Wales, Western Australia and Tasmania advised consumers to avoid eating loose semi-dried tomatoes unless thoroughly cooked.

Waterborne and suspected waterborne outbreaks

OzFoodNet epidemiologists investigated 2 probable waterborne outbreaks during the quarter. The following jurisdictional summaries describe the key features of these outbreaks.

In December, the Northern Territory investigated an outbreak of gastroenteritis amongst a group of workers at a remote mine site. One case was hospitalised. Stool culture isolated *S. Reading*. Investigations revealed that the possible source was the water supply that was used for drinking and cooking. *E. coli* (30 CFU/g in spring) and faecal coliforms (40 CFU/g at spring and 80 CFU/g in pipe) were detected in the water. Camp management sourced bottled water for drinking and cooking and there were no further reports of illness.

In November, an outbreak of gastroenteritis at a rural school was investigated in Victoria. Absentee records showed that 135 students (out of 250) were absent over a 3 week period with the majority (100 students) becoming ill over a 1 week period. Water testing carried out by the school revealed that the private drinking water supply (underground concrete rainwater tank) was not suitable for consumption due to high levels of *E. coli*, but investigations were unable to determine how the water became contaminated. Symptoms appeared to be consistent with a viral illness. The staff drank bottled filtered water during this period and did not appear to be affected in this outbreak.

Cluster investigations

Five cluster investigations were conducted during the quarter; all were clusters of *Salmonella* infection with cases being linked in place and time, but the source of infection and mode of transmission remain unknown. Clusters were due to *S. Heidelberg*, *S. Stanley*, *S. Typhimurium* U302 and two clusters of *S. Virchow* phage type 8.

In New South Wales, a cluster of cluster of 7 cases (6 were children under 9 years of age and 5 lived in the same suburb) of *S. Heidelberg* phage type 1 were identified through routine surveillance of laboratory notifications. No common exposures such

as to animals (e.g. through a petting zoo) could be identified and while interviews revealed a number of foods commonly consumed by cases, the source of this outbreak remains unknown.

In Queensland, a cluster of 6 cases of *S. Stanley* were investigated; 1 case reported overseas travel prior to illness (Thailand), another case had travelled to Sydney and was subsequently linked to the concurrent investigation of *S. Stanley* cases being conducted there (see *Foodborne disease outbreaks*).

A cluster of 13 cases of *S. Virchow* phage type 8 was investigated in South Australia. Hypothesis generating interviews were completed for 9 cases, all of whom reported consuming chicken. Trace back revealed that chicken consumed by eight of 9 cases was sourced from 1 poultry supplier. Routine testing of poultry from this company did not identify *S. Virchow*. Victoria also investigated a cluster of *S. Virchow* 8, with no source identified.

Comments

There were a higher number of foodborne outbreaks ($n=42$) during the 4th quarter of 2009 than in the previous quarter ($n=28$) and this was also an increase when compared with the same quarter in 2008 ($n=31$). This was due to the increased number of foodborne outbreaks of *Salmonella* ($n=11$) and norovirus ($n=13$) investigated. There were also several *Salmonella* clusters that were potentially foodborne for which investigators were unable to determine the source.

Fourteen outbreaks of foodborne disease were linked to imported foods between 2001 and 2007.⁴ The multi-jurisdictional outbreak of hepatitis A associated with semi-dried tomatoes demonstrates that the safety of foods containing imported ingredients is of continuing concern. Trace back of semi-dried tomatoes consumed by cases in Victoria revealed a complicated supply chain with multiple suppliers to multiple brands and imported product that may be mixed or re-packaged for sale. Improvements to the documentation of the supply and distribution chain of tomatoes and other components used for the production of semi-dried tomatoes in Australia would assist in trace back during outbreaks of this kind in the future. Australia notified the World Health Organization of this outbreak in accordance with reporting requirements under the *International Health Regulations* (2005)⁴ due to the suspected link with imported ingredients. OzFoodNet has continued to communicate with the international public health community about developments. Since the end of the quarter, OzFoodNet has been in communication with countries in Europe where poten-

tially linked outbreaks of hepatitis A are occurring. Outcomes of investigations in Australia are helping to inform investigations in those countries.

A limitation of the outbreak data provided by OzFoodNet sites for this report is the potential for variation in categorisation of the features of outbreaks depending on circumstances and investigator interpretation. Changes in the incidence of foodborne outbreaks should be interpreted with caution due to the small numbers each quarter.

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References

1. OzFoodNet Working Group. OzFoodNet quarterly report, 1 October to 31 December 2008. *Commun Dis Intell* 2009;33(1):53–58.
2. OzFoodNet Working Group. OzFoodNet quarterly report, 1 July to 30 September 2009. *Commun Dis Intell* 2009;33(4):426–432.
3. OzFoodNet Working Group. OzFoodNet quarterly report, 1 April to 30 June 2008. *Commun Dis Intell* 2008;32(3):335–340.
4. Kirk M, Musto J, Gregory J, Fullerton K. Obligations to report outbreaks of foodborne disease under the *International Health Regulations* (2005). *Emerg Infect Dis* 2008;14(9):1440–1442.