

Quarterly reports

OzFOODNET QUARTERLY REPORT, 1 JANUARY TO 31 MARCH 2009

The OzFoodNet Working Group

Introduction

The Australian Government Department of Health and Ageing established the OzFoodNet network in 2000 to collaborate nationally to investigate foodborne disease. 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 occurring in Australia from 1 January to 31 March 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 first quarter of 2009, OzFoodNet sites reported 322 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 4,520 people, of whom 158 were hospitalised. There were 10 deaths reported during these outbreaks. The majority (65%, n=209) of outbreaks were due to person-to-person transmission (Table 1).

Table 1: Mode of transmission for outbreaks of gastrointestinal illness, OzFoodNet sites, 1 January to 31 March 2009

Transmission mode	Number of outbreaks	Percentage of total
Foodborne	43	14
Person-to-person	209	65
Recreational water	9	3
Unknown – <i>Salmonella</i> cluster	4	1
Unknown – other pathogen cluster	10	3
Unknown	47	15
Total	322	100

Foodborne disease outbreaks

There were 43 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as the primary mode of transmission (Table 2). These outbreaks affected 495 people and resulted in 70 hospitalisations. There were no reported deaths during these outbreaks. This compares with 31 foodborne outbreaks for the 1st quarter of 2008 and 29 outbreaks for the 4th quarter of 2008.

Salmonella was responsible for 27 outbreaks during this quarter, with *S. Typhimurium* being the most common serotype (79%, n=22). There were 15 outbreaks due to *S. Typhimurium* phage type 170, two due to *S. Typhimurium* 44 and one each due to *S. Typhimurium* 135a, U302 and 197. There were 2 outbreaks of *S. Typhimurium* where phage typing was not reported. There was 1 outbreak each due to *S. Montevideo*, *S. Chester*, *S. Saintpaul*, *S. Singapore* and *S. Virchow*.

Of the remaining 16 outbreaks, five were due to foodborne toxins, including 2 *Clostridium perfringens* outbreaks, 2 outbreaks of fish-associated histamine poisoning and 1 ciguatera fish poisoning outbreak. There were 2 outbreaks due to norovirus and 1 outbreak due to *Campylobacter* infection. The remaining 8 outbreaks were of unknown aetiology.

Fifteen outbreaks (35%) reported in this quarter were associated with food prepared in restaurants, 8 (19%) associated with aged care facilities, 6 (14%) private residences, 4 (9%) commercial caterers, and 3 (7%) takeaway premises. Individual outbreaks were associated with food prepared at a bakery, camp, from primary produce, childcare centre, other institution, nationally franchised fast food restaurant, and a school.

To investigate these outbreaks, sites conducted 5 cohort studies, 2 case control studies, and collected descriptive case series data for 36 investigations. As evidence for the implicated vehicle, investigators collected microbiological evidence in 1 outbreak, analytical epidemiological evidence in 3 outbreaks,

Table 2: Outbreaks of foodborne disease reported by OzFoodNet sites,* 1 January to 31 March 2009 (n=43)

State or territory	Month of outbreak	Setting prepared	Agent	Number affected	Hospitalised	Evidence	Responsible vehicle	
ACT	February	Private residence	Histamine poisoning	2	1	D	Tuna steak	
NSW	February	Restaurant	S. Typhimurium 170	20	0	A	Tiramisu dessert	
	March	Private residence	S. Typhimurium 170	5	0	D	Zucchini bake	
	January	Aged care facility	S. Typhimurium 170	4	0	D	Unknown	
	January	Bakery	S. Typhimurium 170	9	1	D	Chocolate, custard and cream cakes	
	January	Institution – other	S. Typhimurium 170	40	5	A	Hollandaise sauce	
	January	National franchised fast food	S. Typhimurium 170	3	1	D	Unknown	
	January	Private residence	S. Typhimurium 170	68	14	AM	Home made raw egg mayonnaise	
	January	Private residence	S. Typhimurium 170	4	1	D	Unknown	
	January	Restaurant	Unknown	2	0	D	Unknown	
	January	Restaurant	S. Chester	13	2	AM	Chilli sauce	
	January	Restaurant	Histamine poisoning	2	1	D	Tinned anchovies imported from Morocco	
	January	Takeaway	S. Typhimurium 170	2	1	D	Suspected chicken salad roll with homemade mayonnaise	
		February	Aged care facility	<i>C. perfringens</i>	25	0	D	Suspected vegetable gravy
		February	Takeaway	Unknown	6	6	D	Unknown
February		Restaurant	Unknown	5	0	D	Unknown	
February		Takeaway	S. Typhimurium	3	1	D	Unknown	
February		School	S. Typhimurium 170	37	0	D	Unknown	
March		Aged care facility	S. Typhimurium 170	7	2	D	Unknown	
March		Commercial caterer	S. Montevideo	10	2	D	Catered Indonesian foods	
March		Restaurant	Unknown	10	0	D	Unknown	
March		Restaurant	S. Typhimurium 170	2	1	D	Fijian chicken	
March		Restaurant	S. Typhimurium 170	33	13	AM	Fried icecream	
March		Restaurant	S. Virchow	3	1	D	Unknown	
March		Restaurant	<i>Campylobacter</i>	4	0	D	Suspected hickory steak with chips and salad	
NT	March	Private residence	S. Typhimurium U302	2	0	D	Suspected tiramisu	
Qld	February	Aged care facility	S. Typhimurium	3	Unknown	D	Unknown	
	February	Restaurant	Unknown	6	0	D	Unknown	
	February	Commercial caterer	Norovirus	20	1	A	Unknown	
	February	Primary produce	Ciguatera fish poisoning	3	2	D	Spanish mackerel	

Table 2: Outbreaks of foodborne disease reported by OzFoodNet sites,* 1 January to 31 March 2009, continued

State or territory	Month of outbreak	Setting prepared	Agent	Number affected	Hospitalised	Evidence	Responsible vehicle
Qld, cont'd	January	Aged care facility	S. Typhimurium 44	20	4	AM	Suspected vitamised foods and scrambled eggs
	January	Aged care facility	S. Typhimurium 135a	3	0	D	Unknown
	January	Private residence	Norovirus	10	1	D	Unknown
Vic	February	Commercial caterer	S. Typhimurium 170	4	1	D	Unknown
	February	Restaurant	Unknown	10	0	D	Suspected stews and casseroles
	February	Restaurant	S. Typhimurium 197	2	2	D	Unknown
	March	Aged care facility	<i>C. perfringens</i>	22	0	D	Suspected vitamised meals
	March	Camp	Unknown	13	0	D	Unknown
	March	Child care centre	S. Typhimurium 170	18	1	D	Unknown
	March	Private residence	S. Typhimurium 44	7	1	D	Unknown
WA	February	Restaurant	S. Saintpaul	7	1	M	Fried icecream
	February	Aged care facility	Unknown	16	0	D	Unknown
	March	Restaurant	S. Singapore	10	3	D	Unknown

* No foodborne outbreaks were reported by Tasmania or South Australia 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.

and both analytical epidemiological and microbiological evidence in 4 outbreaks. Descriptive evidence only was obtained in 36 outbreaks.

The following jurisdictional summaries describe key outbreaks and public health actions that occurred in this quarter. Tasmania and South Australia did not report any foodborne outbreaks during this quarter.

Australian Capital Territory

The Australian Capital Territory reported 4 outbreaks of foodborne illness during the quarter, three of which were due to *Salmonella* and one due to histamine poisoning.

Twenty people became ill following meals at a restaurant and *S. Typhimurium* 170 was isolated from stool specimens of 8 cases. A case control study showed that illness was associated with eating dessert containing raw eggs. Environmental investigation did not identify any positive foods or

environmental samples. Traceback identified an egg producer/supplier in the Australian Capital Territory, although the same serotype and phage type of *Salmonella* was not isolated. In the 2nd outbreak, 6 people in a single family became ill, with 75% (3/4) of children confirmed with *S. Typhimurium* 170 infection. No source was identified for the cluster. The 3rd outbreak affected a family of five infected with *S. Montevideo* attending a birthday party in New South Wales (reported in New South Wales report).

An outbreak of histamine poisoning affected 2 people after eating tuna steaks purchased from an Australian Capital Territory fishmonger. Traceback identified a Queensland supplier, which was referred to Queensland Health.

New South Wales

New South Wales reported 22 foodborne or suspected foodborne disease outbreaks in the 1st quarter of 2009, with 13 of these being due to *Salmonella*. Ten

of these outbreaks were due to *S. Typhimurium* 170 with closely related multi-locus variable tandem repeat analysis (MLVA) profiles, including:

- 11% (33/308) of customers eating at a Japanese teppanyaki restaurant where people became ill from eating fried icecream (RR: 257.88, 95% CI: 36.39–1827.54). *S. Typhimurium* 170 MLVA type 3-9-7-12-523 was cultured from 12 cases with a matching strain cultured from samples of fried icecream, raw beef and a dish cloth from the restaurant.
- 50% (2/4) of Spanish restaurant customers where people were infected with *S. Typhimurium* 170 (MLVA 3-10-7-9-523). No food samples were tested and the source of the *Salmonella* was never identified.
- 27% (4/15) of aged care facility residents infected with *S. Typhimurium* 170 (MLVA 3-9-7-12-523); the source was never identified.
- 60% (3/5) of children in a single household infected with *S. Typhimurium* 170 (MLVA 3-9-7-13-523), which was suspected to be due to bacon and beef burger meals at a franchise. No source was identified for this outbreak.
- 57% (34/59) of female boarders and 38% (3/8) of staff of a school infected with *S. Typhimurium* 170 (MLVA type 3-9-8-12-523). No source was identified, despite intensive epidemiological and environmental investigations.
- 40% (40/100) of people living in a retirement village infected with *S. Typhimurium* 170 (MLVA type 3-9-8-12-523), which was associated with consumption of Hollandaise sauce prepared with raw eggs (RR: 2.0, 95% CI: 0.6-7.4).
- illness amongst a group of approximately 120 people attending a barbecue at a bowling club who were infected with *S. Typhimurium* 170 (MLVA type 3-9-8-12-523). In a cohort study, 82% (68/83) of people were ill with gastroenteritis, which was associated with consumption of lettuce (RR=1.4 95%CI 1.0-2.0) and Russian salad (RR=1.8 95%CI 1.2-2.9). The Russian salad was prepared with homemade raw egg mayonnaise, which was positive for the same strain of *S. Typhimurium* 170 as that infecting patients.
- 2 people infected with *S. Typhimurium* 170 (MLVA type 3-9-8-12-523) after eating chicken salad with mayonnaise from a café; a specific source wasn't identified.
- 4% (7/162) of residents at an aged care facility infected with *S. Typhimurium* 170 (MLVA type 3-9-8-12-523), with 2 residents hospitalised. All food samples and environmental swabs were negative for *Salmonella* and no source was identified.

- 5 people from 2 families sharing a barbecue were infected with *S. Typhimurium* 170 (MLVA type 3-15-16-14-523). No source of the outbreak was identified.

New South Wales also reported 3 outbreaks due to other serotypes of *Salmonella*. Fifty per cent (10/20) of people attending a birthday party developed illness due to *S. Montevideo*. A family from the Australian Capital Territory was also affected in this outbreak. Indonesian food, including chicken skewers, was served by a caterer as well as a home-made birthday cake and no source was identified. In another outbreak, 14 people from 6 groups were infected with *S. Chester* on 3 consecutive days after eating chilli sauce prepared at a restaurant. Two food handlers who prepared the chilli sauce were asymptotically infected with *S. Chester* and were excluded from work. Chilli sauce and raw chillies were positive for *S. Chester*, although it was not possible to trace the source of chillies. In the 3rd outbreak, three of 4 people from different households developed gastroenteritis after eating chilli crab in a Chinese restaurant; one had *S. Virchow* isolated from their stool. Foods were negative for *Salmonella* and no source was identified.

An outbreak of histamine poisoning affected two out of 8 people after eating Nicoise salad with tinned anchovies and tuna. Elevated histamine (360 mg/kg) was detected in cans of anchovies (imported from Morocco) at the restaurant.

Seventeen per cent (25/146) of residents of an aged care facility were ill with *Clostridium perfringens* intoxication, with enterotoxin A detected in 5 stool samples. The New South Wales Food Authority sampled vegetable gravy that had been inadequately stored, which contained moderate levels of both *C. perfringens* and *Bacillus cereus*.

An outbreak of *Campylobacter* affected 33% (4/12) of people following a meal of steak, chips and salad at a franchise, although no source of the outbreak was identified.

New South Wales health reported a further 4 outbreaks of gastroenteritis of unknown aetiology.

Northern Territory

The Northern Territory reported 1 outbreak of foodborne or suspected foodborne illness during the quarter.

Two people experienced gastroenteritis following a dinner party of 6 people at a private residence. One case tested positive for *S. Typhimurium* U302. The food vehicle was suspected to be tiramisu made with raw eggs.

Queensland

Queensland reported 7 outbreaks of foodborne or suspected foodborne illness during this quarter: *S. Typhimurium* caused 3 outbreaks, norovirus caused 2 outbreaks, ciguatera fish poisoning caused 1 outbreak and there was 1 outbreak where no aetiological agent was identified.

All 3 *Salmonella* outbreaks during the 1st quarter occurred in aged care facilities. In January 2009, 3 residents of a Fraser Coast nursing home were infected with *S. Typhimurium* 135a (MLVA profile 1-3-4-21-3), although no source of infection was identified. Also in January, 20 residents of a Gold Coast nursing home were infected with *S. Typhimurium* 44 (MLVA profile 1-1-19-14-3). The same strain of *S. Typhimurium* was isolated from a swab of the kitchen blender and from several food samples, including vitamised meals and scrambled eggs, although the source of contamination wasn't definitively identified. In February 2009, 2 female residents of a Brisbane aged care facility and a male resident of an adjacent facility were notified with *S. Typhimurium*. All cases consumed egg meals prior to illness; however, no vehicle or source of infection was identified.

Queensland reported 2 foodborne outbreaks due to norovirus during the quarter. The 1st occurred in January and affected 83% (10/12) of people from 3 families who shared a common meal. Onset dates of illness suggested likely foodborne transmission, although no source of infection was identified. In the 2nd norovirus outbreak, 68% (20/29) of people attending a work conference became ill after consuming sandwiches and bakery items. Hot cross buns (RR 2.2, 95% CI 1.0–4.8) were associated with illness and a mixture of person-to-person and foodborne transmission was suspected.

In February 2009, 3 people were affected by ciguatera fish poisoning after eating Spanish mackerel steaks. The median incubation period was 6 hours (range 4–9 hours) and 2 case patients were hospitalised. The fish (>20 kg) was purchased from a Brisbane market and had been caught off Mooloolaba by a private fisherman.

Six people became ill with gastroenteritis after eating at a Gold Coast restaurant in February 2009. No faecal specimens were collected, although *B. cereus* was detected in 83% (5/6) swabs from the kitchen. No vehicle or source of infection was identified.

Victoria

Victoria reported 7 outbreaks of foodborne or suspected foodborne illness this quarter.

There were 3 foodborne outbreaks in February 2009. The 1st affected a group of people staying at a motel where 24% (10/42) of people eating a buffet meal became ill with diarrhoea. Clinical illness was consistent with *C. perfringens* intoxication and 1 faecal specimen was positive for *C. perfringens* enterotoxin. In the 2nd outbreak, 2 people who regularly ate food at the same restaurant were infected with *S. Typhimurium* 197, although no source was identified. In the 3rd outbreak, 4% (3/80) of people attending a 40th wedding anniversary were infected with *S. Typhimurium* 170, along with an employee. No source was identified for the outbreak.

In March, 22 residents of an aged care home experienced diarrhoea, with most people becoming ill on a single day. Ten of the cases had a vitamised diet representing 33% of all of the people in the facility on this diet, although the association was not significant (RR 1.6, 95% CI 0.79–3.4). Ten faecal specimens were positive for *C. perfringens* enterotoxin.

Routine surveillance identified an outbreak of *S. Typhimurium* 170 amongst 17 children attending the same child care centre. One staff member was also affected. No source was identified for the outbreak. In March, gastrointestinal illness affected a group of 93 people attending a bushwalking club weekend. The attack rate was 43% amongst 30 people responding to a questionnaire and no source for the outbreak was identified. The illness was consistent with a bacterial intoxication. Routine surveillance identified an outbreak of *S. Typhimurium* 44 affecting 5 people attending a birthday party at a private home, although no source was identified.

Western Australia

Western Australia reported 3 outbreaks during the 1st quarter of 2009.

Seven cases of *S. Saintpaul* were associated with eating at an Asian restaurant in January 2009, with cases reporting incubation periods ranging from 3.5 hours to 10 days. Eighty-six per cent (6/7) of cases had eaten fried icecream, and one case had eaten a red bean dessert with no icecream. People attending the restaurant during this period were contacted but no further cases were identified. Fried icecream was positive for *S. Saintpaul*, which was indistinguishable from human strains by pulsed-field gel electrophoresis (PFGE). The source of *S. Saintpaul* contamination of the fried icecream was not identified.

In February 2009, 33% (16/48) of residents of a high care unit in an aged care facility experienced diarrhoea with onset of illness over a 2 day period and a median duration of 1.5 days. Two staff members were ill with diarrhoea and vomiting. Consuming

vitamised food was strongly associated with illness (OR 11.5, CI 1.9-116.6). Thirteen faecal samples were negative for common bacterial and viral pathogens, as well as bacterial toxins. Two stools were positive for *C. perfringens* but had different PFGE profiles. There were no remaining food samples from the period prior to onset of illness, and more recent food samples that had been vitamised were negative for common bacterial pathogens and toxin. The aetiological agent and source of infection were not identified.

Ten cases of *S. Singapore* were notified in February and March 2009. Five cases had eaten at the same outlet of an Asian franchise restaurant and another case ate at a different outlet of the same franchise. There were no reports of staff illness and chicken meat samples were negative for *Salmonella*. The source of *S. Singapore* from the restaurant franchise was not identified.

Cluster investigations

During the 1st quarter of 2009, OzFoodNet investigated a multi-jurisdictional outbreak in Shiga toxin-producing *Escherichia coli* (STEC) O157 infection. The Microbiological Diagnostic Unit Public Health Laboratory typed isolates using PFGE and phage typing and identified that amongst STEC O157 cases, there was a distinct cluster of 14 cases in Queensland (3 cases), New South Wales (3 cases), Victoria (1 case), and South Australia (7 cases). OzFoodNet epidemiologists identified several foods of interest through hypothesis generating interviews, but there were no common brands and the number of cases declined before an analytical study could be performed.

During the 1st quarter of 2009, jurisdictions reported increases in cryptosporidiosis, including the Australian Capital Territory with 68 cases in the 1st quarter of 2009 compared with seven for same time period in 2008, and Queensland with 1,036 cases in the 1st quarter of 2009 compared with 241 in 2008. Queensland reported that a cluster of 12 cases of cryptosporidiosis in the Sunshine Coast in March had swum at the same aquatic centre, where 2 water samples were positive for *Cryptosporidium*. The Northern Territory reported clusters of cases of cryptosporidiosis in remote communities.

Several clusters of *Salmonella* were investigated during the quarter, including serotypes Montevideo, Singapore, Virchow, subspecies 1, Waycross, and Typhimurium phage types 197, 9, 44 and 170/108. Victoria investigated a cluster of 4 cases of locally acquired typhoid infection where case patients shopped at the same food store. There were no secondary cases among families of the 4 cases. Despite intensive investigations, no source was identified.

In addition, jurisdictions investigated clusters of a range of other enteric infections during the quarter, including: yersiniosis and listeriosis in Queensland, multi-drug resistant *Shigella sonnei* biotype G in Victoria, *Shigella sonnei* biotype A, and *Shigella flexneri* 3b and STEC O157 (with a different PFGE to the multi-jurisdictional outbreak) in Western Australia.

Comments

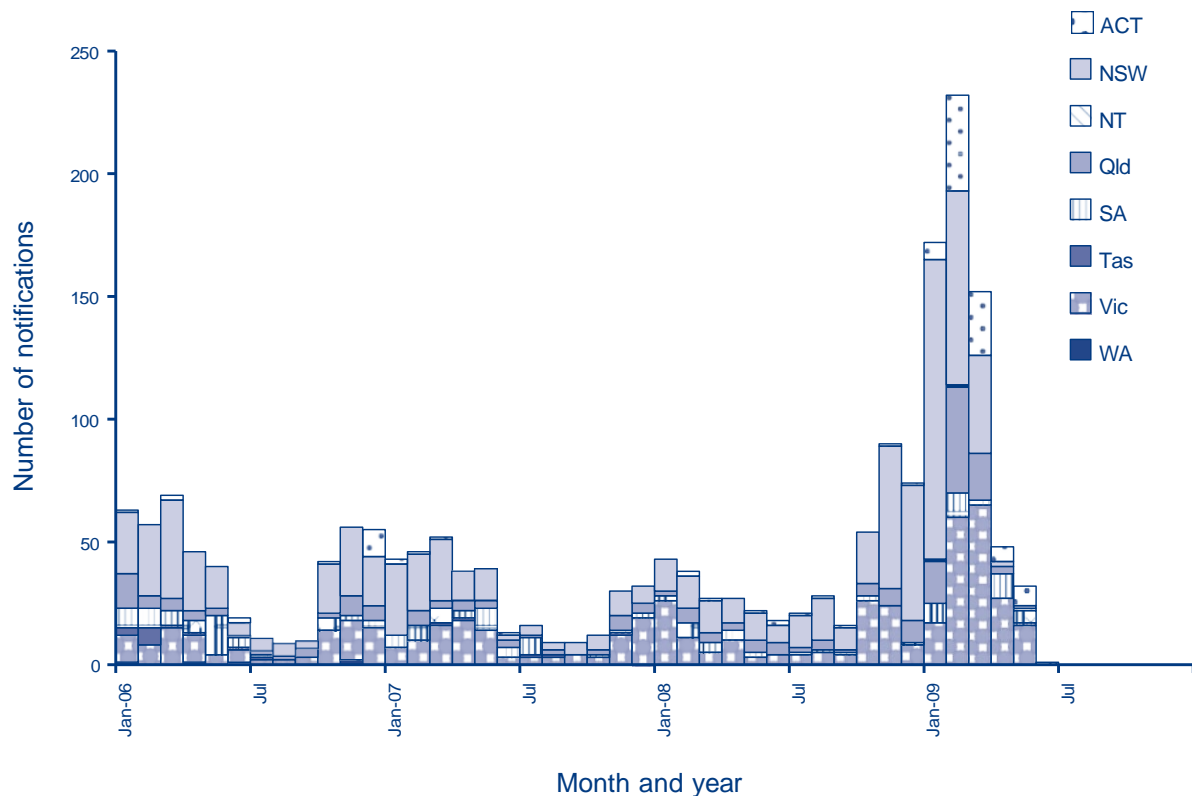
There were a large number of foodborne outbreaks (n=43) during the quarter when compared with the previous quarter and the same quarter in 2008. The main cause of the increase was a large increase in both sporadic cases and point source outbreaks due to *S. Typhimurium* 170/108 (Figure). In total, there were 15 outbreaks of *S. Typhimurium* 170/108 this quarter, with 11 occurring in New South Wales. As a result of the large number of outbreaks and increase in sporadic notifications of this phage type, OzFoodNet initiated a multi-jurisdictional outbreak investigation in April 2009.

The majority of these *S. Typhimurium* 170/108 outbreaks were suspected to be caused by contaminated eggs, which are a consistent cause of *Salmonella* outbreaks in Australia.^{1,2} This is partly because eggs are a commonly consumed food, but also due to the endemic nature of *Salmonella* in egg-laying flocks. It is important that consumers and the food service industry recognise the risks associated with raw or partially cooked eggs. Food Standards Australia New Zealand is currently preparing a primary production and processing standard for the egg production sector to improve food safety relating to eggs in Australia.¹

During the quarter there were 8 outbreaks of foodborne disease in aged care facilities, which is higher than previous years. Five of these outbreaks were due to *Salmonella*, which reflects the general upsurge in salmonellosis outbreaks during summer and autumn. Outbreaks of gastroenteritis are common amongst aged care facility residents, but most of these are non-foodborne.³ In Australia, a new food standard was introduced that was designed to protect populations that may be more vulnerable to foodborne infections, such as those living in aged care facilities.⁴

During the quarter, jurisdictions used a variety of typing schema and nomenclature for *Salmonella*, which made it difficult to determine whether increases in infections in 1 jurisdiction related to that occurring in other jurisdictions. For the investigation into the multi-jurisdictional outbreak of STEC, it was necessary to send isolates or specimens from several jurisdictions to a single laboratory due to the complicated nature of testing. Laboratories

Figure: Notifications of Salmonella Typhimurium 170/108 to state and territory health departments, National Notifiable Diseases Surveillance System, Australia, 2006 to June 2009



Data were extracted on 25 June 2009.

are fundamental to foodborne disease investigation and it is important to understand the impact of changes in laboratory testing on outbreak detection and investigation.⁵

Acknowledgements

OzFoodNet thanks the investigators in the public health units and state and territory departments of health, as well as public health laboratories and local government environmental health officers who provided data used in this report. We would also like to thank laboratories conducting serotyping, molecular typing and phage typing of *Salmonella* for their continuing work during this quarter.

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