

Quarterly report

OzFoodNet QUARTERLY REPORT, 1 JANUARY TO 31 MARCH 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 January and 31 March 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 1st quarter of 2015 (1 January to 31 March), OzFoodNet sites reported 399 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 5,899 people affected in these outbreaks and 253 hospitalisations. There were 20 deaths reported during these outbreaks. This represents a decrease in the number of people affected compared with the 5-year average from 2010 to 2014 for the 1st quarter

(6,626). The majority of reported outbreaks of gastrointestinal illness in Australia are due to person-to-person transmission. In this quarter, 74% (296/399) of outbreaks were transmitted via this route (Table 1). This percentage was slightly higher than the same quarter in 2014 (72%, 335/465) but the total number is lower than the 5-year mean (1st quarter, 2010–2014) of 302 outbreaks transmitted person-to-person. Of the person-to-person outbreaks in the 1st quarter of 2015, 52% (153/296) occurred in child care facilities and 39% (114/296) occurred in aged care facilities.

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). These outbreaks affected 891 people, of which 602 were laboratory-confirmed cases, and resulted in 101 hospitalisations. There were 2 deaths reported during these outbreaks.

This was a decrease on the number of foodborne outbreaks that were reported in the 4th quarter of 2014 (54) and an increase on the 5-year mean for the 1st quarter between 2010 and 2014 (45). 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

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

Transmission mode	Number of outbreaks and clusters	Per cent of total*	Number ill
Person-to-person	296	74	4,361
Foodborne and suspected foodborne	47	12	891
Unknown	43	11	361
Unknown (<i>Salmonella</i> cluster)	11	3	265
Suspected waterborne	2	1	21
Total	399	100	5,899

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

number of foodborne disease outbreaks should be interpreted with caution due to the small number each quarter.

Salmonella Typhimurium was identified as the aetiological agent in 74% (35/47) of foodborne or suspected foodborne outbreaks during this quarter (Appendix); a higher proportion than for the same quarter in 2014 (67%, 33/49). The aetiological agents for the remaining outbreaks included: norovirus in 3 outbreaks; ciguatoxin in 2 outbreaks; and *Clostridium perfringens*; *S. Bovismorbificans*; *Salmonella* (untyped); *S. Virchow*; and histamine poisoning for 1 outbreak each. For 2 outbreaks the aetiological agent was unknown.

Twenty-seven outbreaks (57% of all foodborne or suspected foodborne outbreaks) reported in this quarter were associated with food prepared in restaurants (Table 2). This was higher than the average number of restaurant associated foodborne or suspected foodborne outbreaks in the 1st quarter from 2010 to 2014 (18).

To investigate these outbreaks, sites conducted 2 cohort studies, 5 case control studies and collected descriptive case series data for 27 investigations. For 13 outbreaks, no individual patient data were collected. The evidence used to implicate food vehicles included analytical evidence in 4 outbreaks, microbiological evidence in 8 outbreaks, both analytical and microbiological evidence in 4 outbreaks, and descriptive evidence in 31 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 in this quarter. For reporting purposes, both of these outbreaks were considered New South Wales events, one of which is described in the New South Wales key outbreaks.

New South Wales

There were 15 outbreaks of foodborne or suspected foodborne illness reported in New South Wales in this quarter. The aetiological agents identified were *S. Typhimurium* (for 9 outbreaks) and *S. Bovismorbificans*, *S. Virchow*, *Salmonella* (untyped) and histamine poisoning (for 1 outbreak each). Two outbreaks were of unknown aetiology.

Description of key outbreaks

An outbreak was investigated after salmonellosis affected 33 residents across 10 aged care facilities (ACFs) in New South Wales and the Australian Capital Territory. Facility-based attack rates ranged from 0.6% to 7.5%. The ACF's were managed by the same organisation and shared common food suppliers. All 33 cases tested positive for *S. Bovismorbificans*, 30 were further characterised as phage type (PT) 14 and the remaining 3 were not phage typed. The environmental investigation

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

Food preparation setting	Number of outbreaks	Per cent of foodborne outbreaks*	Number ill	Number laboratory confirmed
Restaurant	27	57	375	258
Takeaway	5	11	51	14
Aged care	4	9	48	42
Private residence	2	4	26	12
Primary production	2	4	8	0
Other (Conference centre)	2	4	170	151
Commercial caterer	1	2	7	1
National franchised fast food restaurants	1	2	48	46
Institution – not otherwise specified	1	2	69	31
Picnic	1	2	4	3
Unknown	1	2	85	44
Total	47	100	891	602

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

identified *S. Bovismorbificans* PT 14 at the premises of a baked dessert supplier to the ACFs and in food samples.

An outbreak was investigated in February after 4 separate cases of suspected histamine fish poisoning. Cases presented with red face, headache, tingling, sweating, vomiting and palpitations. An investigation identified a total of 7 suspected cases who had consumed tuna salad from the same local food outlet. Onset of symptoms was within 10 to 15 minutes of tuna consumption. The NSW Food Authority initiated an investigation resulting in a trade level recall of an imported canned tuna product.

Northern Territory

There were no outbreaks of foodborne or suspected foodborne illness reported in the Northern Territory in this quarter.

Queensland

There were 16 outbreaks of foodborne or suspected foodborne illness reported in Queensland in this quarter. This represents 34% of the total number of foodborne or suspected foodborne outbreaks for the quarter (16/47) nationally, but 66% of the total number of people affected (584/891). The aetiological agents identified were *S. Typhimurium* (for 13 outbreaks), ciguatoxin (for 2 outbreaks) and norovirus (for 1 outbreak).

Description of key outbreaks

An outbreak was investigated in January after Queensland Health was notified of gastrointestinal illness by several hospital emergency departments and members of the public who had consumed meals at the same restaurant over several days. In total, 138 people from multiple groups reported symptoms including diarrhoea and/or vomiting and/or stomach cramps. *S. Typhimurium* with the multi-locus variable number tandem repeat analysis (MLVA) pattern 03-12-11-12-523* was identified in 95 cases. A case-control study identified multiple food items significantly associated with illness including deep fried ice-cream (adjusted odds ratio [aOR] 122.7, 95% confidence interval [CI] 31.0–485.4, $P = 0.001$), lemon chicken (aOR 14.5, 95% CI 2.1–98.5, $P = 0.006$) and sweet and sour pork (aOR 5.2, 95% CI 1.3–21.1, $P = 0.02$). Environmental health officers identified multiple food hygiene issues and widespread

bacterial contamination throughout the premises. *S. Typhimurium* MLVA 03-12-11-12-523 was detected on surfaces and in multiple food items from the restaurant kitchen, as well as in drag swabs and (spent) chicken feed from the egg farm that supplied the restaurant. Regulatory action was subsequently taken against the restaurant.

An outbreak was investigated in March after multiple cases of illness were associated with meals consumed at the same café. In total, 44 people reported either diarrhoea, vomiting or stomach cramps within 3 days after consuming a meal at the café, or had a stool sample that was culture positive for *S. Typhimurium* MLVA 03-17-09-11-523. Thirty-one cases were laboratory confirmed. A case-control study identified a significant association between an eggs Benedict meal and illness (OR 124.4, 95% CI 14.2–3693.7, $P < 0.001$). Environmental health officers identified hygiene and temperature control issues at the café and the license was temporarily suspended. *S. Typhimurium* MLVA 03-17-09-11-523 was isolated from guacamole, tea towels, a cleaning cloth and swabs from the sink area at the café. These findings were indicative of cross contamination within the kitchen. The same pathogen was also found in drag swabs and chicken faeces samples from the supplying egg farm.

An outbreak involving at least 140 cases of salmonellosis was investigated in association with a conference held in late February. Nine cases were hospitalised. A case control study identified 2 items significantly associated with illness: rum and raisin bread cake (aOR 4.0, 95% CI 1.7–9.3, $P = 0.001$) and custard (aOR 11.3, 95% CI 4.8–26.5, $P < 0.001$). *S. Typhimurium* MLVA 03-12-12-09-523 was isolated from the faecal specimens collected from 58 attendees. Isolates with the same MLVA type were identified on 3 swabs taken from a stick blender used to prepare the implicated food, and in environmental samples from the farm of one of the egg suppliers. Following this investigation, the facility removed stick blenders from the kitchen, introduced the use of pasteurised egg and 'high risk' menu items were removed. It also adopted an ongoing microbial monitoring regime as part of its food safety program.

An outbreak was investigated in January and February after 48 cases of *S. Typhimurium* PT U307, MLVA 03-12-11-12-523 were linked to over 20 outlets of the same franchised food chain. Fourteen hospitalisations were reported. Food histories collected from the cases identified a chocolate mousse product that was consumed by 84% of cases. Environmental health investigations identified that the chocolate mousse was supplied to a central kitchen by another manufacturer.

* In December 2014, the Queensland enteric reference laboratory Queensland Health Forensic and Scientific Services agreed to harmonise reporting of the MLVA STTR3 allele '524' as '523' in line with other states and territories.

Chocolate mousse samples collected from retail and multiple food samples collected from the manufacturer (including chocolate mousse and a selection of cheesecakes and chocolate cakes) were positive for *S. Typhimurium* 03-12-11-12-523. These products were all prepared using a raw egg mixture with no subsequent cooking step. Investigations identified that the chocolate mousse product had also been supplied to 2 venues where outbreaks of the same *S. Typhimurium* MLVA had occurred in the 4th quarter of 2014. All food businesses supplied with these raw egg-based products were requested to withdraw the products from sale and destroy them. The manufacturer ceased making the products and switched to the use of pasteurised egg.

An outbreak in January affected at least 85 people who reported consuming Korean style 'Kimbap' sushi packs. Kimbap is a potentially hazardous food because it is usually kept at room temperature to avoid retrogradation of the rice starch.¹ It also is not acidified with rice vinegar. The kimbap packs were from multiple outlets and contained combinations of egg, tuna, vegetables, ham or seafood extender. Environmental health investigations were able to trace the production of the kimbap packs to a single unlicensed manufacturer, although the kitchen where the kimbap was prepared was not located. Forty-four faecal specimens tested positive for *S. Typhimurium* MLVA 03-12-11-12-523, as did 2 retail samples of kimbap. A source of contamination was unable to be confirmed during this outbreak, though eggs were suspected based on findings from multiple concurrent outbreaks occurring within Queensland with the same MLVA profile.

South Australia

There were 4 outbreaks of foodborne and suspected foodborne illness reported in South Australia in this quarter. The aetiological agent identified for all 4 outbreaks was *S. Typhimurium*.

Description of key outbreaks

An outbreak was investigated after initial interviewing identified 3 *S. Typhimurium* PT 9 cases that had consumed meals at the same hotel. Further investigation linked a total of 7 cases to the same hotel. Two cases were hospitalised. *S. Typhimurium* PT 9, MLVA 03-24-13-10-523 was subsequently isolated from environmental swabs of the internal components of the stick blender used to prepare raw egg aioli, soups and dressings at the hotel. All 7 human cases had the same MLVA profile as the environmental sample from the stick blender.

Tasmania

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

Victoria

There were 6 outbreaks of foodborne or suspected foodborne illness reported in Victoria in this quarter. The aetiological agents identified were *S. Typhimurium* (for 5 outbreaks) and *C. perfringens*.

Description of key outbreaks

An outbreak investigation commenced in February after 4 cases of *S. Typhimurium* PT 9, MLVA 03-24-16/15-12-525 were identified to be clustered geographically by residence. Investigations revealed that the cases had eaten at one of 2 cafés owned and operated by the same proprietors. Further case finding identified an additional 14 cases who had eaten at either of these cafés. Of the 18 ill, 13 (including 4 staff members), were confirmed with *S. Typhimurium* PT 9 with the outbreak MLVA pattern. Five cases were hospitalised. Sixteen cases had eaten sandwiches (14 chicken and mayonnaise and 2 tuna and mayonnaise), including 2 employees of the café. A sample of the chicken and mayonnaise mixture was positive for *S. Typhimurium* PT 9, with the outbreak MLVA pattern. The implicated mayonnaise was prepared onsite with raw eggs. The source of *S. Typhimurium* PT 9 in the chicken and mayonnaise mixture was unable to be confirmed.

An outbreak was investigated in February following notification of 2 cases of *S. Typhimurium* PT 135a, MLVA 03-11-11-16-525 in residents of the same ACF. The cases resided in the same wing, required fully assisted feeding and only consumed vitamised meals. An inspection revealed that the blender used to vitamise meals was also used for blending raw eggs. Faecal specimens were taken from a further 12 residents who were asymptomatic but consumed vitamised meals; 5 were positive for *S. Typhimurium* PT 135a, MLVA 03-11-11-16-525. Food and environmental samples including swabs of the blender used to vitamise meals were negative for *Salmonella*. This outbreak was suspected to have been caused by cross contamination from eggs.

Western Australia

There were 4 outbreaks of foodborne or suspected foodborne illness reported in Western Australia in this quarter. The aetiological agents identified were norovirus and *S. Typhimurium* (for 2 outbreaks each).

Description of key outbreaks

An outbreak was investigated in January following a report of gastroenteritis in 32 prisoners and 10 staff at a correctional facility. *S. Typhimurium* pulsed-field gel electrophoresis (PFGE) 3 was isolated from 8 faecal specimens. One suspect meal was identified, which included a potato salad made with a raw egg mayonnaise. The eggs were sourced from a prison farm. In February, the same farm reported a gastroenteritis outbreak involving 13 prisoners, with *S. Typhimurium* PFGE 3 isolated from 2 faecal specimens. In this outbreak, prisoners reported drinking raw egg milkshakes. In March, a 2nd outbreak occurred at a regional prison, involving 6 prisoners and 1 staff member. *S. Typhimurium* PFGE 3 was isolated from 2 faecal specimens. Prisoners again reported drinking raw egg milkshakes. A further 7 apparently sporadic cases of *S. Typhimurium* PFGE 3 were notified from 6 prisons. An inspection of the egg production facilities at the implicated farm found a basic operation, with no candling or routine cleaning of eggs. A chicken feed sample was positive for *S. Typhimurium* PFGE 3 but eggs sampled, and subsequent feed samples, were negative for *Salmonella*.

Multi-jurisdictional investigations

Between October 2014 and May 2015, an outbreak of hepatitis A associated with the consumption of a frozen mixed berry product occurred across multiple jurisdictions. This required a multi-jurisdictional response involving state health departments, OzFoodNet, public health reference laboratories, agriculture and food agencies. Although the majority of cases occurred in this quarter, the report of this investigation will be included in the 1 April to 30 June 2015 (2nd quarter) OzFoodNet national quarterly report.

Cluster investigations

During this quarter, OzFoodNet sites conducted investigations into 54 outbreaks and clusters for which no common food vehicle or source of infection could be identified. Aetiological agents that were able to be identified during the investigations included *S. Typhimurium* (for 7 clusters), *Shigella* spp. (for 2 clusters), and *S. Agona*, *S. Kiambu*, *S. Newport*, *S. Saintpaul* and rotavirus (for 1 cluster each).

Comments

During this quarter, 891 people were affected by foodborne or suspected foodborne outbreaks. This is a 24% increase on the number affected in the 1st quarter of 2014 (721) and a 65% increase on the 5-year mean (2010–2014) for this quarter (539).

Outbreaks in Queensland accounted for 66% (584) of the total number of people affected by foodborne outbreaks; 96% (558) of these were affected in 13 outbreaks of *S. Typhimurium*. The 2 largest of these outbreaks, which affected 140 people attending a conference and 138 people at a restaurant respectively, are discussed under Queensland's description of key outbreaks.

In this quarter, *S. Typhimurium* was the aetiological agent for 81% (13/16) of the foodborne outbreaks for which an analytical and/or microbiological link to a food vehicle was established. Seventy-seven per cent (10/13) of the *S. Typhimurium* outbreaks were associated with the consumption of raw or minimally cooked egg dishes. These outbreaks affected 516 people, which was 94% (516/550) of the total affected by *S. Typhimurium* outbreaks in the quarter.

Cross contamination between raw eggs or raw egg products and ready-to-eat food items can occur when equipment, such as stick or other blenders, are not properly cleaned and sanitised between processing of these food types. In this quarter, blending equipment was associated with 4 outbreaks of *S. Typhimurium* (2 in Queensland, 1 in South Australia and 1 in Victoria), affecting 2,518 people. Cross contamination is a risk when using stick mixers or blenders to process raw foods such as eggs, due to the potential contamination of internal components and the difficulty in being able to thoroughly clean them. Blenders and stick mixers should be regularly dismantled, cleaned and sanitised.² In addition, one piece of mixing equipment should be allocated for raw high risk foods (such as cakes/pancake batter and raw egg deserts) and another separate piece of mixing equipment for ready-to-eat foods that will not be cooked after the blending step (such as whipped cream).

Acknowledgements

OzFoodNet thanks the investigators in the public health units and state and territory departments of health, as well as public health laboratories, local government environmental health officers and food safety agencies who provided the data used in this report. We would particularly like to thank the reference laboratories for conducting sub-typing of *Salmonella* species and other enteric pathogens and for their continuing work and advice during the quarter.

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

State or territory	Month†	Setting prepared	Agent responsible	Number affected*	Number lab confirmed	Number hospitalised‡	Evidence	Responsible vehicles
NSW	Jan	Restaurant	<i>Salmonella</i> Typhimurium MLVA 03-09-08-12-523	3	1	0	D	Tiramisu
NSW	Jan	Restaurant	Unknown	3	0	0	D	Unknown
NSW	Jan	Aged care facility	<i>S. Bovismorbificans</i>	33	33	12	AM	Baked dessert items
NSW	Jan	Restaurant	<i>S. Typhimurium</i> MLVA 03-12-11-14-523	12	11	0	D	Menu items containing undercooked egg
NSW	Jan	Restaurant	<i>S. Typhimurium</i> MLVA 03-12-11-14-523	2	2	0	D	Suspected raw egg sauces
NSW	Jan	Restaurant	<i>S. Typhimurium</i> MLVA 03-12-13-09-523	13	13	3	D	Unknown
NSW	Feb	Restaurant	<i>S. Typhimurium</i> MLVA 03-09-07-12-523 and 03-12-09-523	5	3	0	D	Unknown
NSW	Feb	Takeaway	Unknown	30	0	Unknown	D	Vietnamese style chicken and salad rolls
NSW	Feb	Takeaway	Histamine fish poisoning	7	0	0	M	Canned tuna
NSW	Feb	Restaurant	<i>S. Virchow</i>	3	2	1	D	Menu items containing undercooked egg
NSW	Feb	Restaurant	<i>S. Typhimurium</i> MLVA 03-10-08-12-523	9	3	0	D	Unknown
NSW	Mar	Community event	<i>S. Typhimurium</i> PT 12A	4	3	3	D	Pancake batter containing eggs
NSW	Mar	Restaurant	<i>S. Typhimurium</i> MLVA 03-24-14-10-523	7	7	0	D	Unknown
NSW	Mar	Restaurant	<i>Salmonella</i> spp. (PCR only)	5	1	1	D	Tiramisu
NSW	Mar	Restaurant	<i>S. Typhimurium</i> MLVA 03-09-07-13-523	4	4	0	D	Menu items containing undercooked egg
Qld	Jan	Restaurant	<i>S. Typhimurium</i> MLVA 03-12-11-12-523	138	95	Unknown	AM	Deep fried ice-cream
Qld	Jan	Restaurant	<i>S. Typhimurium</i> MLVA 03-12-12-12-523	16	11	0	AM	Deep fried ice-cream
Qld	Jan	Unknown	<i>S. Typhimurium</i> MLVA 03-12-11-12-523	85	44	Unknown	M	Kimbab style sushi
Qld	Jan	Aged care facility	<i>S. Typhimurium</i> MLVA 03-12-11-12-523	4	2	1	M	Suspected egg dish
Qld	Jan	National franchised fast food restaurant	<i>S. Typhimurium</i> PT U307, MLVA 03-12-11-12-523	48	46	14	M	Chocolate mousse
Qld	Jan	Primary produce	Ciguatera fish poisoning	2	0	0	D	Cod
Qld	Feb	Restaurant	<i>S. Typhimurium</i> MLVA 03-12-13-09-523	17	9	2	A	Roast duck
Qld	Feb	Restaurant	<i>S. Typhimurium</i> MLVA 03-12-13-09-523	3	3	0	D	Lamb tartare with raw egg
Qld	Feb	Private residence	<i>S. Typhimurium</i> MLVA 03-12-10-12-523	6	6	1	D	Sushi
Qld	Feb	Restaurant	Norovirus GII	18	11	0	D	Unknown
Qld	Feb	Restaurant	<i>S. Typhimurium</i> MLVA 03-12-12-09-523	7	7	1	D	Eggs Benedict
Qld	Feb	Other	<i>S. Typhimurium</i> MLVA 03-12-12-09-523	30	11	3	D	Unknown
Qld	Feb	Other	<i>S. Typhimurium</i> MLVA 03-12-12-09-523	140	140	9	AM	Rum and raisin bread cake with custard
Qld	Mar	Restaurant	<i>S. Typhimurium</i> MLVA 03-17-09-11-523	44	31	23	A	Eggs Benedict
Qld	Mar	Primary produce	Ciguatera fish poisoning	6	0	1	D	Spanish mackerel
Qld	Mar	Private residence	<i>S. Typhimurium</i> MLVA 03-12-10-11-523	20	6	4	M	Chicken long soup (with egg and chicken)

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

State or territory	Month†	Setting prepared	Agent responsible	Number affected‡	Number lab confirmed	Number hospitalised‡	Evidence	Responsible vehicles
SA	Feb	Restaurant	S. Typhimurium PT 135, MLVA 03-12-09-11-523	7	7	1	D	Raw egg sun-dried tomato aioli
SA	Feb	Restaurant	S. Typhimurium PT 135a, MLVA 03-12-12-09-523	3	2	0	D	Raw egg aioli
SA	Feb	Restaurant	S. Typhimurium PT 135a, MLVA 03-13-10-10-523	2	2	0	D	Unknown
SA	Mar	Restaurant	S. Typhimurium PT 9, MLVA 03-24-13-10-523	7	7	2	M	Contaminated stick blender
SA	Mar	Restaurant	S. Typhimurium PT 9, MLVA 03-15-06-11-550 and MLVA 03-24-13-10-523	7	7	2	D	Eggs; poached, scrambled or omelette
SA	Mar	Takeaway	S. Typhimurium PT 9, MLVA 03-14-08-11-550	4	4	1	D	Unknown
Vic.	Jan	Aged care facility	<i>Clostridium perfringens</i>	4	1	0	D	Unknown
Vic.	Feb	Restaurant	S. Typhimurium PT 9	18	13	5	M	Chicken and raw egg mayonnaise mixture
Vic.	Feb	Aged care facility	S. Typhimurium PT 135a, MLVA 03-11-11-16-525	7	7	0	D	Vitamised food suspected
Vic.	Mar	Restaurant	S. Typhimurium PT 135a	3	2	0	M	Raw egg mayonnaise
Vic.	Mar	Restaurant	S. Typhimurium PT 135a	10	3	1	A	Pork dish
Vic.	Mar	Takeaway	S. Typhimurium PT 135a	6	6	6	D	Chicken suspected
WA	Jan	Restaurant	Norovirus	9	1	0	A	Multiple salads
WA	Jan	Institution – not otherwise specified	S. Typhimurium PFGE 3, MLVA 03-11-15-10-523	69	31	4	D	Raw egg mayonnaise and raw egg milkshakes
WA	Mar	Commercial caterer	Norovirus	7	1	0	D	Unknown
WA	Mar	Takeaway	S. Typhimurium PFGE 13, MLVA 05-04-14/15-11-490	4	4	0	D	Premade sandwiches
Total				891	602	101		

* No foodborne outbreaks were reported in the Australian Capital Territory, the Northern Territory or Tasmania, during the quarter.

† 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.