

OzFoodNet—Enhancing Foodborne Disease Surveillance across Australia

Fourth Quarter Summary, October – December, 2017 NSW

NSW OzFoodNet



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Highlights Quarter 4, 2017

Introduction

This report describes data for enteric conditions for quarter 4, 2017. The report is divided into four sections: enteric notifiable diseases, foodborne outbreaks, *Salmonella* spotlight, and gastroenteritis outbreaks in institutions. Data in this report have been extracted from the NSW Notifiable Conditions Information Management System, NSW OzFoodNet Outbreak Database and the NSW Gastroenteritis in Institutions Database. Every endeavour has been made to ensure that the information provided in this document was accurate at the time of writing. However, infectious disease notification data are continuously updated and subject to change.

Summary

During the fourth quarter of 2017, rotavirus and hepatitis A cases were double the five year quarterly average for the same period (Table 1). Shigellosis cases increased by a quarter above the five year quarterly average. Cryptosporidiosis cases decreased by two fifths and hepatitis E cases decreased by a third compared to the five year quarterly average (Table 1). Smaller decreases compared to the five year quarterly average were reported for listeriosis, salmonellosis, typhoid and Shiga toxin-producing *Escherichia coli* (STEC). No cases of haemolytic uraemic syndrome (HUS) were reported. The long term trends for the twelve notifiable enteric conditions in NSW are shown in Figures 1-3.

There were 736 cases of **rotavirus** infection reported, double the five year quarterly average of 354 cases. However, the number of cases decreased by a third compared to the previous quarter (n=1,120), which had the highest number of notifications of any single quarter since 2012. The cause of the increase in rotavirus infection in the second half of 2017 in most Australian jurisdictions is under investigation. Immunisation to prevent rotavirus infection or reduce the severity of infection is recommended and free for children, and in NSW is given at six weeks and four months of age. The vaccine is 70% effective for any rotavirus infection and 85-100% effective for severe rotavirus infection.

There were 30 cases of **hepatitis A**, of which 12 were locally acquired, five times above the five year quarterly average of 2.4 locally acquired cases (Table 2). The number of locally acquired cases decreased by more than half compared to the number reported in the previous quarter (n=27), representing a slowdown in the outbreak which has been attributed primarily to sexual transmission among men who have sex with men (MSM). All 12 locally acquired cases in quarter 4 were adult males and three quarters reported being MSM. The hepatitis A strains from these cases were similar to either the VRD_521_2016 or RIVM-HAV16-090 strains, which are causing a large, multi-country outbreak in Europe, also predominantly among MSM. Control measures implemented during quarter 3 continued in collaboration with community-based sexual health organisations, including a campaign to raise awareness of the outbreak and encourage high risk groups (particularly MSM) to get vaccinated against hepatitis A.

There were 837 cases of **salmonellosis** reported, 13% lower than the five year quarterly average of 957 cases. *Salmonella* Typhimurium continued to decline in quarter 4, with half the number of cases compared to average (n=213, 53% below the 5 year quarterly average). The number of *Salmonella* Enteritidis cases was slightly higher than average (n=48, 6% higher than the five year quarterly average). Notable *Salmonella* serotype increases in this quarter included *S. Wangata* (45 cases; 105% increase) and *S. ser 4,5,12:i:-*, (39 cases; 141% increase). Detailed analysis of *Salmonella* notifications is described on page 9.

Twelve **foodborne or suspected foodborne outbreaks** were reported affecting 98 people (Table 1), of whom three were hospitalised (Table 3). A pathogen was identified in four outbreaks. *Salmonella* Singapore was associated with consumption of sandwich wraps from a café in one outbreak, and *Campylobacter* species was associated with consumption of undercooked lamb liver in another outbreak. *Salmonella* Enteritidis and norovirus were detected in two other outbreaks but the food agent was unable to be determined. Another outbreak was likely caused by a range of significant procedural and hygiene issues, but the food source and

pathogen were unable to be identified. The food outbreaks are unknown (Table 4).
sources and causative pathogens of the remaining

Figures 1-3. Number of notifications by year, quarter and disease, Jan 2012 to Dec 2017

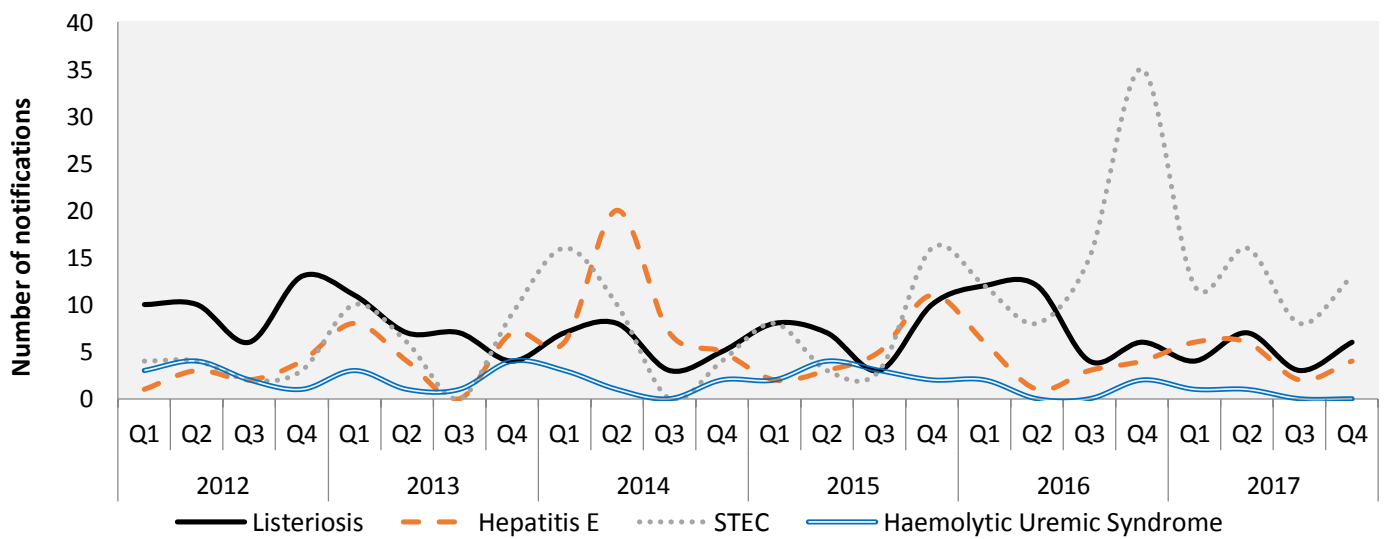
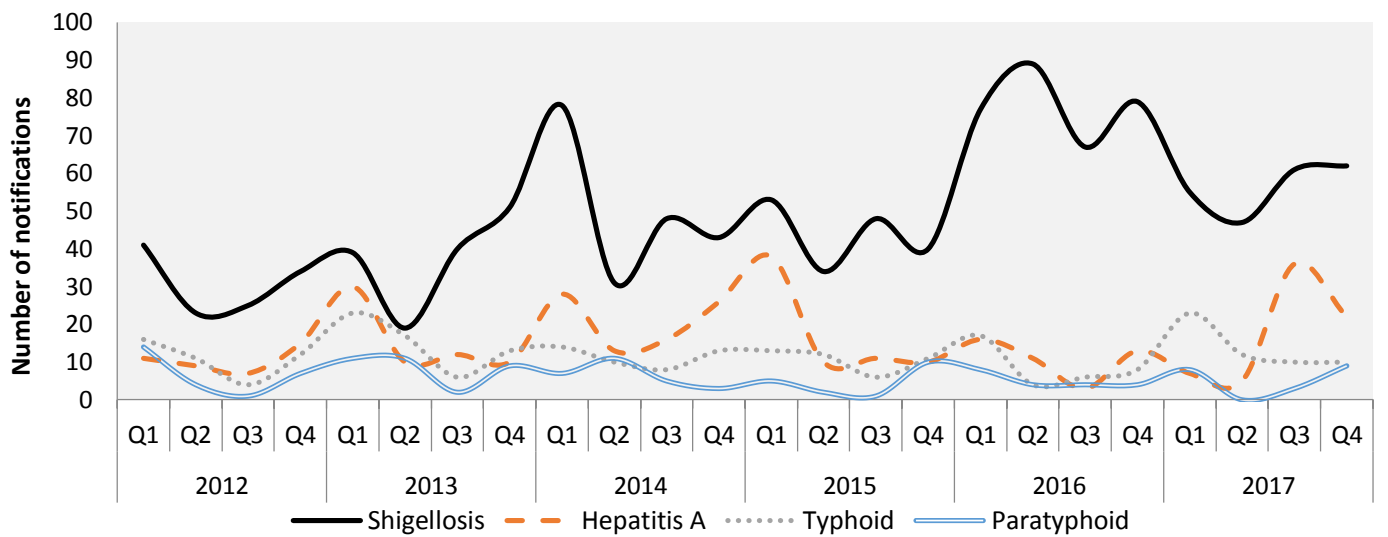
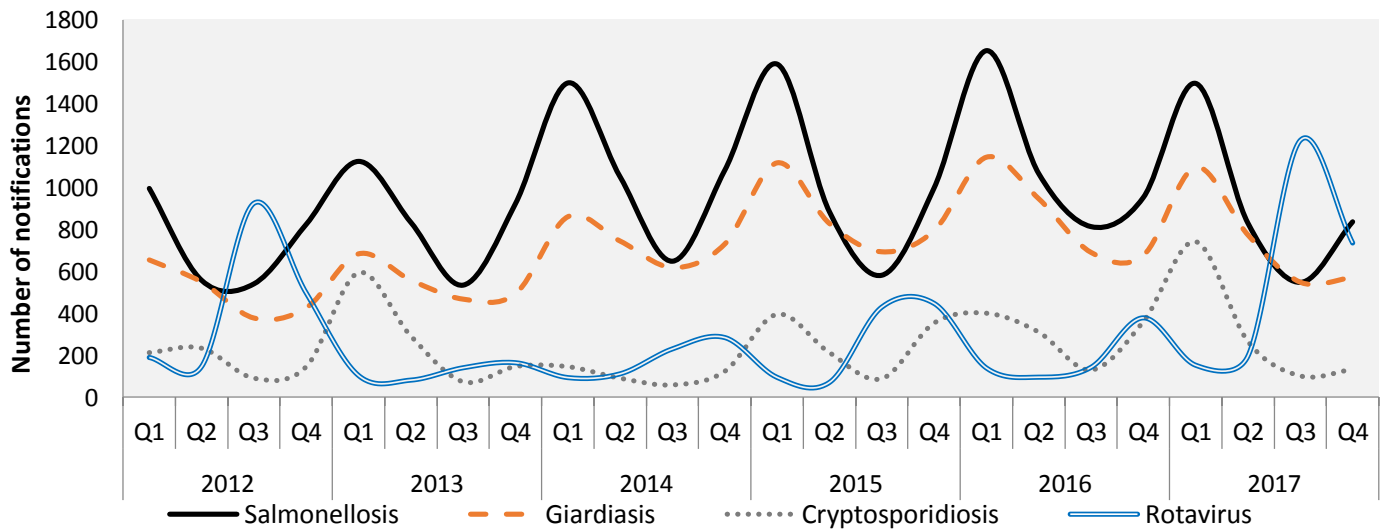


Table 1. Notifiable enteric conditions, quarter 4 2017, by Local Health District

Notifiable Disease		CC	FW	HNE	IS	M	MNC	NBM	NNSW	NS	SES	SNSW	SWS	Syd	WNSW	WS	NSW
Botulism	Notified, Q4 2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q4 mean, 2012-2016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cryptosporidiosis	Notified, Q4 2017	6	1	28	10	11	3	4	12	13	14	2	4	9	7	9	133
	5 y Q4 mean, 2012-2016	5.0	0.4	49.2	12.8	15.8	4.2	10.0	12.2	24.8	29.0	5.4	11.2	11.6	22.4	12.4	226.4
Giardiasis	Notified, Q4 2017	28	1	74	31	20	26	21	40	78	89	13	36	47	22	45	571
	5 y Q4 mean, 2012-2016	23.6	1.0	79.2	37.6	28.6	15.2	34.0	18.4	99.8	103.6	15.4	44.0	52.4	26.0	46.0	624.8
Hepatitis A	Notified, Q4 2017	2	0	3	0	0	0	1	0	4	6	0	5	5	0	4	30
	5 y Q4 mean, 2012-2016	0.6	0.0	0.2	0.6	0.0	0.4	0.2	0.4	0.8	2.0	0.4	2.6	2.2	0.4	4.0	14.8
Hepatitis E	Notified, Q4 2017	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	4
	5 y Q4 mean, 2012-2016	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.0	1.4	0.0	0.8	0.4	0.0	1.2	6.2
Listeriosis	Notified, Q4 2017	0	0	1	0	0	0	0	1	1	0	0	0	2	0	1	6
	5 y Q4 mean, 2012-2016	0.4	0.0	0.6	0.8	0.0	0.2	0.2	0.0	0.8	1.4	0.4	0.8	0.8	0.2	0.8	7.4
Rotavirus	Notified, Q4 2017	19	4	53	28	36	3	25	28	93	110	14	121	71	16	115	736
	5 y Q4 mean, 2012-2016	11.0	2.4	51.2	7.4	13.4	1.6	15.8	14.0	50.6	45.2	6.0	40.4	32.6	19.4	43.4	354.4
Salmonellosis	Notified, Q4 2017	39	8	93	42	49	44	39	71	86	95	16	76	67	22	90	837
	5 y Q4 mean, 2012-2016	41.2	5.2	112.0	46.4	37.2	32.0	40.8	58.2	141.2	122.8	22.8	90.2	82.0	26.4	98.2	956.6
Shigellosis	Notified, Q4 2017	1	0	3	1	2	0	2	2	6	16	0	6	21	0	6	66
	5 y Q4 mean, 2012-2016	1.6	0.2	2.6	2.2	0.6	0.6	1.0	2.6	4.4	15.2	0.2	3.0	11.2	0.8	3.2	49.4
STEC	Notified, Q4 2017	0	0	1	1	4	0	0	0	0	0	4	0	0	2	1	13
	5 y Q4 mean, 2012-2016	0.4	0.0	3.0	0.4	1.6	0.2	0.0	0.4	0.6	1.4	2.4	0.0	0.0	1.2	1.8	13.4
HUS	Notified, Q4 2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q4 mean, 2012-2016	0.0	0.0	0.2	0.2	0.4	0.2	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.2	0.2	2.2
Typhoid	Notified, Q4 2017	0	0	0	1	0	0	0	0	2	2	0	1	1	1	2	10
	5 y Q4 mean, 2012-2016	0.0	0.0	0.2	0.0	0.0	0.2	0.2	0.0	0.8	3.0	0.0	2.6	1.0	0.2	3.2	11.4
Foodborne* Outbreaks	Notified, Q4 2017	1	0	1	2	1	0	0	0	1	4	1	0	0	0	1	12
	People affected	3	0	8	11	20	0	0	0	4	35	8	0	0	0	9	98
Salmonella Cluster	Notified, Q4 2017	0	0	4	4	1	3	3	3	5	6	1	5	5	59	4	†8
	People affected	0	0	13	8	7	8	16	3	8	14	1	7	15	9	7	116

Legend: Blue shading refers to a 100% or greater increase in the number of notifications compared to the five year quarterly average. *Foodborne or potentially foodborne outbreaks. Local Health District (LHD) abbreviations: Central Coast LHD (CC), Far West NSW LHD (FW), Western NSW LHD (WNSW), Hunter New England LHD (HNE), Illawarra Shoalhaven LHD (IS), South Western Sydney LHD (SWS), Mid North Coast LHD (MNC), Northern NSW LHD (NNSW), Murrumbidgee LHD (M), Southern NSW LHD (SNSW), Nepean Blue Mountains LHD (NBM), Northern Sydney LHD (NS), South Eastern Sydney LHD (SES), Sydney LHD (Syd), Western Sydney LHD (WS).

Table 2. Notifiable enteric conditions by overseas or local acquisition, quarter 4 2017

Notifiable Disease	Place infection acquired	NSW, Q4 2017	5 yr Q4 mean 2012-2016	2017 % change
Hepatitis A	Locally acquired	12	2.4	400%
	Overseas acquired	18	11.8	53%
	Unknown	0	0.6	-100%
Hepatitis E	Locally acquired	2	1.4	43%
	Overseas acquired	2	4.4	-55%
	Unknown	0	0.4	-100%
Paratyphoid	Locally acquired	0	0.2	-100%
	Overseas acquired	8	6.2	29%
	Unknown	1	0.2	400%
S. Enteritidis	Locally acquired	9	4.6	96%
	Overseas acquired	36	34.2	5%
	Unknown	3	6.6	-55%
Shigellosis	Locally acquired	37	23.2	59%
	Overseas acquired	26	18.6	24%
	Unknown	3	7.6	-61%
STEC/VTEC	Locally acquired	11	9.2	21%
	Overseas acquired	0	1	-100%
	Unknown	2	3.2	-38%
Typhoid	Locally acquired	0	1.2	-100%
	Overseas acquired	10	10	0%
	Unknown	0	0.2	-100%

Legend: Blue shading refers to a 100% or greater increase in the number of notifications compared to the five year quarterly average.

Foodborne and suspected foodborne outbreaks

In NSW, gastroenteritis and foodborne outbreaks are identified via a range of mechanisms, including reports from the public, general practitioners, institutions such as residential care facilities and child care centres, emergency departments, analysis of surveillance data, and reports to the NSW Food Authority's (NSWFA) Consumer Complaints Line.

Table 3. Foodborne and suspected foodborne outbreaks, quarter 4 2017

PHU ID	Month [#]	Setting	Agent responsible	No. ill	Lab confirmed	No. Hospitalised	Evidence	Responsible vehicles	Contributing factors
HUN0517	Oct	restaurant	Unknown	8	0	0	D	Unknown	Unknown
IS57055	Oct	restaurant	Unknown	6	0	0	D	Unknown	Various significant procedural and hygiene issues
IS57141	Oct	restaurant	Unknown	5	0	0	D	Unknown	Unknown
SES57228	Oct	commercial caterer	Unknown	17	0	0	D	Unknown	Unknown
CC57453	Nov	restaurant	<i>Salmonella</i> Singapore	3	3	0	D	Sandwich wraps	Unknown
M57599	Nov	restaurant	Unknown	20	0	1	D	Unknown	Unknown
SES57685	Nov	restaurant	Unknown	8	0	0	D	Unknown	Unknown
NS201704	Dec	private residence	Unknown	4	0	0	D	Salad with tuna	Unknown
S57734	Dec	restaurant	Norovirus	8	1	2	D	Unknown	Unknown
SES201704	Dec	cruise	<i>Salmonella</i> Enteritidis	8	8	0	D	Unknown	Unknown
SES57914	Dec	restaurant	<i>Campylobacter</i> species	2	1	0	D	Lamb liver	Undercooking
WS57818	Dec	restaurant	Unknown	9	0	0	D	Unknown	Unknown

[#]Month of outbreak is the month of onset of first case or month of notification/investigation of the outbreak.

Evidence category:

A Analytical epidemiological association between illness and 1 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.

MLVA Multi-locus variable number tandem repeat analysis.

A summary of the most notable outbreaks is described on pages 8-9.

Notable Foodborne Outbreaks

Key points:

- Complaint trend analysis combined with targeted compliance strategies can lead to the identification and effective management of food safety risks.
- Raw egg-based products, such as aioli and mayonnaise, are high risk foods and must be appropriately handled to avoid foodborne illness.
- Innovative use of technology, such as sending SMS texts to *Salmonella* cases, can lead to earlier identification of outbreaks and assist in determining likely sources.
- Whole genome sequencing, in conjunction with historical case interview data, can help determine the genetic origin of imported enteric pathogens, and inform control measures.

Suspected foodborne outbreak at a restaurant

On 4 October 2017, the NSW Food Authority received a complaint of gastrointestinal illness affecting a group of patrons at a restaurant. This group comprised three unrelated households who had not associated with one another prior to the dinner.

The public health unit interviewed the complainant, who reported that six of eight (75%) members from the group had gastroenteritis symptoms (vomiting, diarrhoea and abdominal cramps) ranging from 1 to 12 hours after dinner. Symptoms lasted from 24 hours to six days. None of the cases sought medical attention and no stool specimens were collected.

The affected adults had shared items from the banquet platter. Two children from the party did not eat from the platters, and did not develop symptoms.

Local council advised the NSW Food Authority that this venue had been the subject of a previous complaint in March 2017 where two of four members of a group developed vomiting four hours after consuming items from a shared mixed platter. The business was found to be preparing a raw egg sauce at that time.

Inspection of the premises by local council and NSW Food Authority revealed significant procedural and hygiene issues including improper handling of raw egg products, inadequate temperature control of

cooked rice, and sanitising issues with a non-functioning dishwasher. A prohibition order was issued to address raw egg use. NSW Food Authority and the local council are working with the restaurant to rectify sanitising and temperature control issues.

Salmonella Singapore associated with two cafés in a shopping centre

As part of a project implemented in September 2017 where all *Salmonella* cases with mobile phone numbers are sent an SMS asking them about food venue exposures in the three days prior to their illness, the Communicable Diseases Branch received SMS responses on 8 and 9 November 2017 from two *Salmonella* cases who reported eating at the same café.

The cases were contacted and both had developed gastroenteritis symptoms including diarrhoea 4 to 12 hours after consuming pre-made chicken wraps at the same café on different days. A third case mentioned in an SMS reply that he consumed a chicken wrap in a different café in the same shopping centre. All three cases were typed as *Salmonella* Singapore.

Inspection of both cafés by local council revealed that they were owned by the same operator. Both kitchens were noted to be small and there was no sanitiser available. There were also minor issues relating to temperature control. Environmental samples were collected but were negative for all pathogens. Local council worked with the operator to rectify the operational issues. Based on epidemiological investigations, it is thought that the cluster was likely caused by the consumption of contaminated chicken wraps. There is no ongoing public health risk.

Salmonella Enteritidis outbreak on a cruise ship

In early December 2017, a cluster of eight cases of *Salmonella* Enteritidis was reported in passengers on a cruise ship, travelling from Southeast Asia to Sydney. Of the eight cases, six were from NSW, one was from Victoria and one was from Queensland.

Seven cases from the outbreak were interviewed and eggs, chicken and fresh fruit were identified as common exposures. The NSW Food Authority and South Eastern Sydney Public Health Unit conducted a joint inspection of the vessel in Sydney. No concerns relating to food handling practices were found. A variety of locally and overseas sourced food samples were collected, which were negative for *Salmonella*.

This was the second *Salmonella* Enteritidis outbreak associated with this cruise ship, the first involving eleven cases on the same voyage from Southeast Asia to Sydney during the previous summer (reported in Q1 2017).

Whole genome sequencing of all eight isolates from the second outbreak indicated they were identical or closely related. These isolates were genetically distinct from the isolates in the first outbreak and are not thought to have been caused by the same food item. Comparison of the sequences from the two *Salmonella* Enteritidis outbreaks revealed that the isolates from the second outbreak were most closely related to isolates from cases unrelated to the cruise who had travelled to a particular South East Asian country, which was one of the countries where the vessel had brought on food items at port. These isolates were distinct from unrelated infections acquired in the countries of other ports that the ship had docked.

Based on epidemiological and laboratory investigations, it is thought that the cluster was likely caused by consumption of contaminated food items supplied from the implicated port at one or more of the restaurants on board the ship, however a food source was not able to be identified. These results have been communicated to the vessel operator, which is reviewing their food supply chains in that country.

***Campylobacter* associated with a restaurant**

On 20 December 2017, the NSW Food Authority received a complaint of gastrointestinal illness affecting a group of patrons at a restaurant. The two affected patrons were from separate households.

The public health unit interviewed both affected patrons, who reported that two of seven (29%) members of the group had gastroenteritis symptoms (bloody diarrhoea, vomiting, abdominal pain and fever) 50 hours (range 41-60 hours) after the meal. The duration of symptoms was more than seven days. Both cases sought medical attention however, only one stool specimen was collected in which a *Campylobacter* species was isolated.

Both affected cases reported having consumed undercooked lamb's fry (liver). The other members of the group did not consume that dish, and remained well.

The NSW Food Authority advised the premise to withhold the lamb's fry from sale until inspection by the local council. No significant hygiene or food handling issues (including sufficient cooking of the lamb's fry) were reported at inspection by the local council. Based on epidemiological and laboratory investigations, it is thought that the cluster was likely caused by the consumption of undercooked lamb's fry, which may have been undercooked on this one occasion. There is no ongoing public health risk.

Salmonella spotlight

There were 837 notifications of salmonellosis between 1 October and 31 December 2017, accounting for 35% of all enteric notifications. This represents a 14% decline in the number of *Salmonella* infections when compared to the five year quarterly average of 957 cases. The top ten *Salmonella* serotypes are shown in Figure 4.

The most common serovar was *Salmonella* Typhimurium, making up 26% (n=213) of all *Salmonella* notifications. The number of *Salmonella* Typhimurium cases reported in quarter 4 was less than half (53% below) the five year quarterly average of 452 cases. There has been an overall decline in the number of *Salmonella* Typhimurium cases since 2012 (Figure 5). *Salmonella* Typhimurium MLVA profile 3-17-9-11-523 was most prominent, accounting for 5.2% of all typed isolates (Table 4).

Salmonella Enteritidis was the second most common serovar making up 6% of all reported *Salmonella* cases. While the long term trend shows an overall

increase in *Salmonella* Enteritidis since 2012 (Figure 5), the number of cases (n=48) in this quarter was in line with the 5 year average of 45 cases. One fifth (n=9, 19%) of *Salmonella* Enteritidis cases were locally acquired (Table 2). There were no obvious connections between these cases and no indication of a common source. NSW Food Authority was informed and the situation is being closely monitored.

The next most common serovars in quarter 4 were *Salmonella* Wangata (n=45) and *Salmonella* ser 4,5,12:i:- (n=39), both increased in quarter 4 compared to the five year quarterly average (by 105% and 141% respectively). *Salmonella* Wangata is thought to be transmitted primarily via environmental reservoirs and is the focus of an ongoing investigation. The seasonal trends for *Salmonella* Wangata and *Salmonella* Birkenhead, another environmental serovar, are almost identical (Figure 6).

Figure 4. Proportion of *Salmonella* serovars, quarter 4 2017 (N= 837)

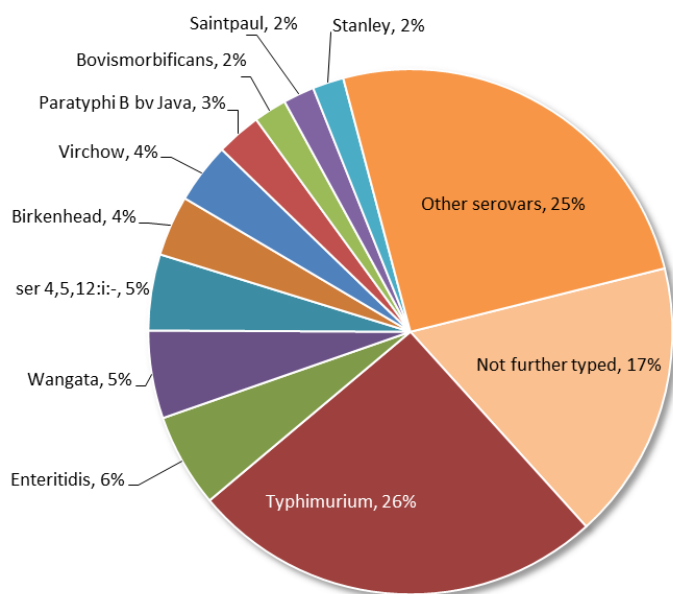


Table 4. Top 12 *Salmonella* Typhimurium MLVAs, quarter 4 2017

MLVA	Notifications	% of <i>S. Tm</i> typed
3-17-9-11-523	10	5.2%
3-9-7-14-523	7	3.6%
3-23-15-11-523	6	3.1%
1-10-0-0-463	5	2.6%
1-9-0-0-463	5	2.6%
3-9-7-12-523	5	2.6%
3-12-12-9-523	4	2.1%
3-12-13-9-523	4	2.1%
3-13-14-8-523	4	2.1%
4-15-11-0-490	4	2.1%
4-15-12-0-490	4	2.1%
4-16-13-0-517	4	2.1%
Top 12 total	62	32.0%

Figure 5. Trends for *Salmonella* Typhimurium and *Salmonella* Enteritidis in NSW, 2012-2017, by quarter

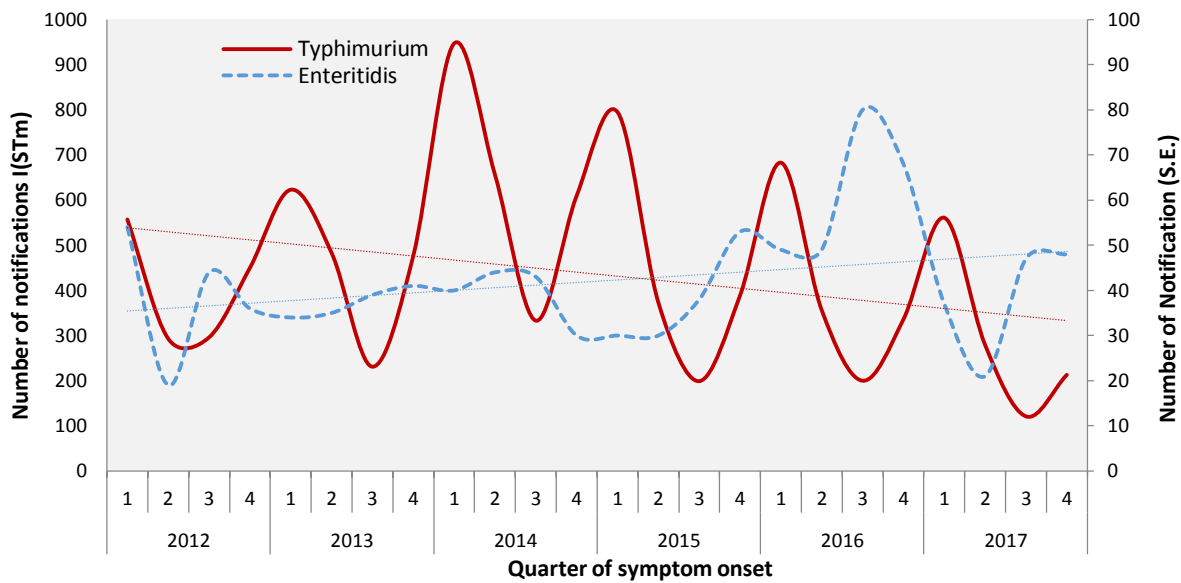
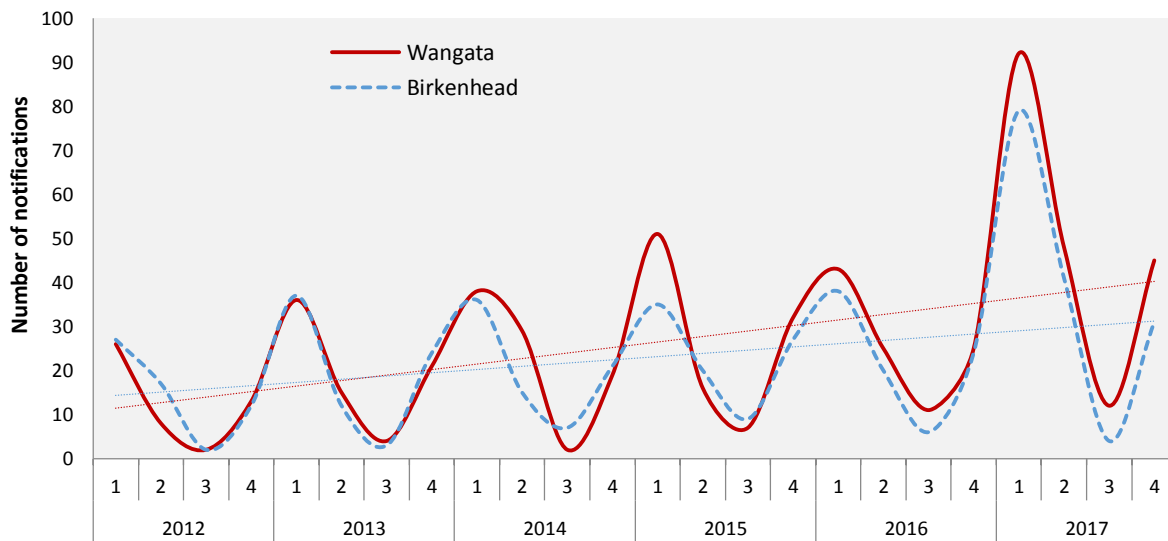


Figure 6. Trends for *Salmonella* Wangata and *Salmonella* Birkenhead in NSW, 2012-2017, by quarter



Whole Genome Sequencing: *S. Typhimurium*

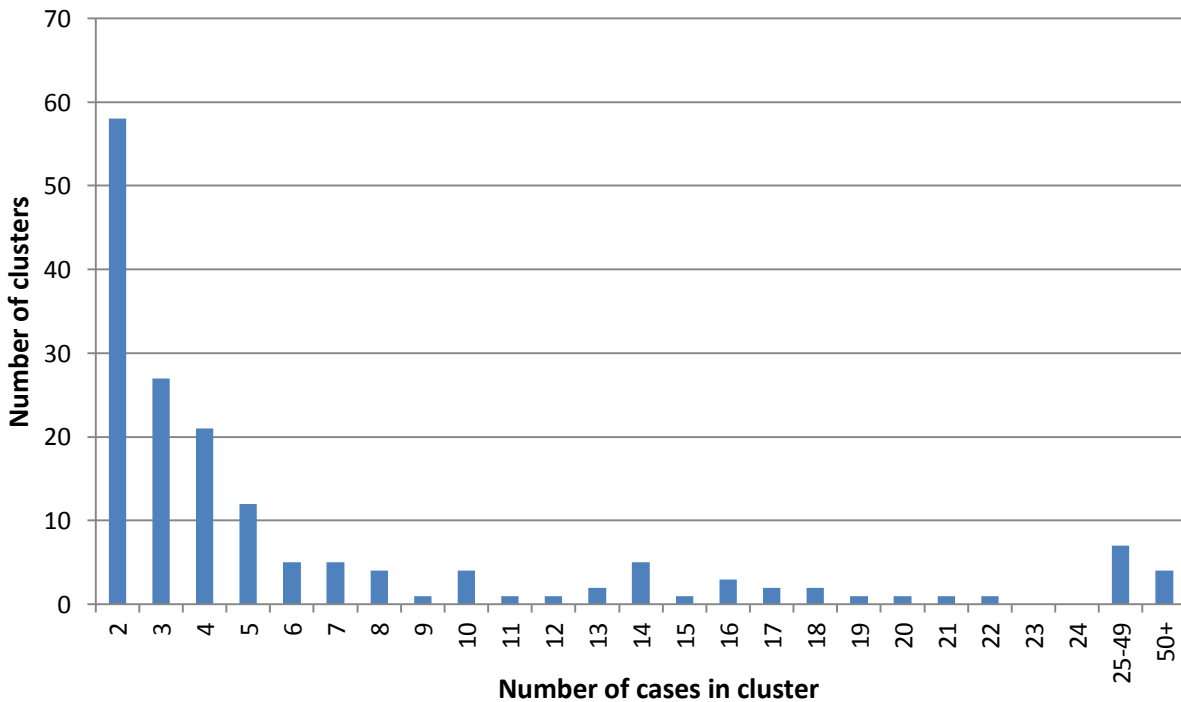
All *Salmonella* Typhimurium cases in NSW with specimen collection dates after 1 October 2016 undergo whole genome sequencing (WGS) as part of a two year translational research grant project.

In quarter 4 of 2017, 233 specimens from NSW residents were submitted for whole genome sequencing, for which 227 results were available (97% of all *Salmonella* Typhimurium isolates submitted for sequencing). Of these, 41 clusters were detected, affecting 141 people (62%). The clusters ranged in size from two to fourteen cases, with a median cluster size of three cases. An additional 24 isolates from this quarter clustered with isolates collected in earlier quarters, between 1 October 2016 and 30 September 2017.

During this quarter, turnaround time between specimen collection and receipt of genomic cluster report remained mostly stable, with a slight increase for specimens collected in December, as no sequencing run was performed the week of Christmas. The median turnaround time was 25 days (range 14-48), compared to a median of 24 days in the previous quarter.

WGS cluster results are reviewed weekly by a group that includes OzFoodNet epidemiologists from NSW, ACT and Hunter New England, ICPMR, and the NSW Food Authority. 20 clusters were examined in more detail, of which thirteen proceeded to investigation. The remaining seven were monitored. No common food sources or environments were identified as a result of the investigations.

Figure 7. Number of cases in each *Salmonella* Typhimurium WGS cluster, from 1 October 2016 to 31 December 2017



Gastroenteritis Outbreaks in Institutions

From 1 October to 31 December 2017, a total of 217 outbreaks of suspected viral gastrointestinal illness in institutions were reported in NSW affecting at least 2,941 people (Table 5). This is a 22% increase on the average number of outbreaks reported during the same quarter from 2012 to 2016 (n=178), and a 12% increase in the mean number of people affected as a result of the gastroenteritis outbreaks (n=2,624).

Of the 217 outbreaks, 131 (60%) occurred in child care centres, 73 (34%) in aged care facilities, 11 (5%) in hospitals and two (1%) in other facilities (Table 6). The number of outbreaks was highest in October 2017 following a large gastroenteritis season in quarter 3 (when the number of gastro outbreaks peaked), but decreased to below average levels by December 2017 (Figure 8).

Overall, 11.2% of staff members and 15.9% of non-staff became sick during gastroenteritis outbreaks (attack rate) in quarter 4 (Table 6). The highest attack rate for gastrointestinal disease for staff was in child care centres (14.2%) and for non-staff was in hospital wards (37.2%). Outbreaks lasted 8.5 days on average; shortest in schools (5 days) and longest in child care centres (10 days) (Table 6).

One or more stool samples were collected in 80 (37%) of the outbreaks. Norovirus was identified in 38 (47.5%) of these outbreaks and rotavirus was identified in 8 (10%). The results of the other samples were negative, or not reported (Table 6).

Public health units monitor gastroenteritis outbreaks in institutions and provide advice on control measures.

Figure 8. Number of reported outbreaks of gastrointestinal illness in institutions, quarter 4 2017 compared to the 5 year quarterly average, by month and facility type

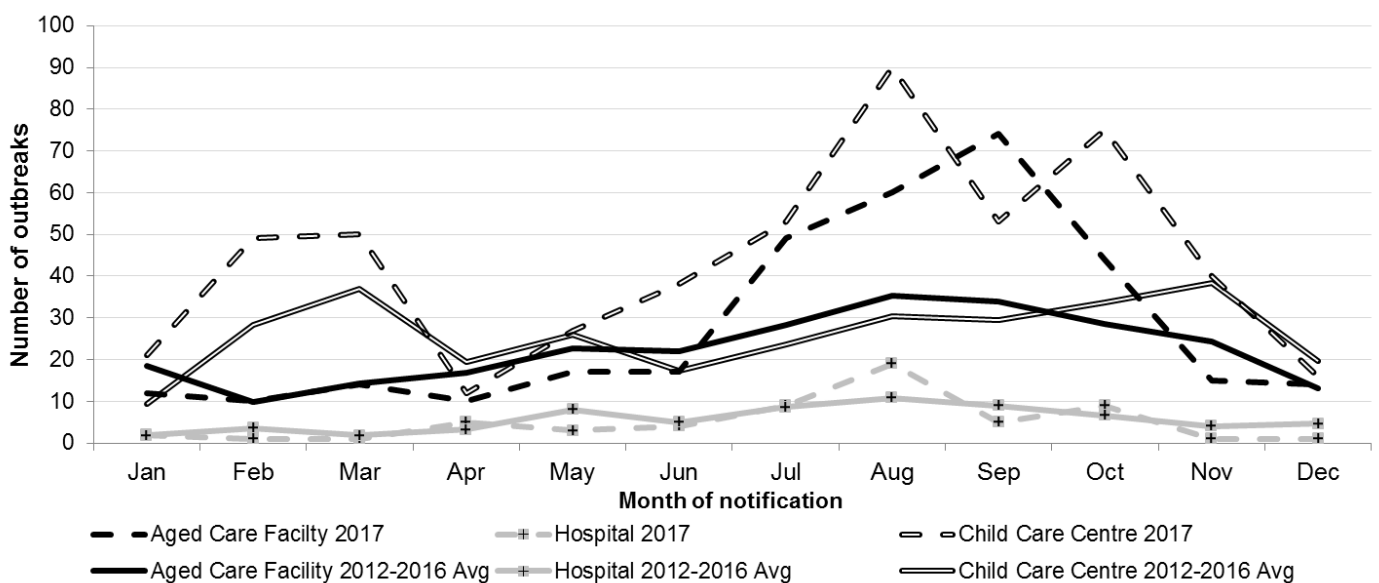


Table 5. Outbreaks of gastroenteritis in institutions reported in NSW, quarter 4 2017, by Local Health District

Facility type	Q4 2017	FW	HNE	IS	M	MNC	NBM	NNWS	NS	SES	SNSW	SWS	Syd	WNSW	WS	NSW
ACF	No. of outbreaks	1	11	1	2	0	4	5	11	5	2	10	7	4	10	73
	Staff affected	10	38	0	9	0	41	42	16	16	14	44	21	11	19	281
	Non-staff affectedd	33	168	5	15	0	116	107	132	80	28	162	112	71	121	1150
CCC	No. of outbreaks	0	16	11	10	2	15	0	16	13	5	8	15	0	20	131
	Staff affected	0	37	31	25	1	32	0	27	27	16	15	24	0	41	276
	Non-staff affectedd	0	126	109	127	5	159	0	120	105	45	42	116	0	147	1101
Hospital	No. of outbreaks	0	1	0	1	0	0	0	3	2	1	0	1	0	2	11
	Staff affected	0	6	0	1	0	0	0	3	4	6	0	6	0	12	38
	Non-staff affectedd	0	9	0	5	0	0	0	16	16	11	0	4	0	15	76
Other	No. of outbreaks	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
	Staff affected	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	Non-staff affectedd	0	0	0	0	0	0	0	8	10	0	0	0	0	0	18

Local Health District (LHD) abbreviations: Far West NSW LHD (FW), Western NSW LHD (WNSW), Hunter New England LHD (HNE), Illawarra Shoalhaven LHD (IS), South Western Sydney LHD (SWS), Mid North Coast LHD (MNC), Northern NSW LHD (NNSW), Murrumbidgee LHD (M), Southern NSW LHD (SNSW), Nepean Blue Mountains LHD (NBM), Northern Sydney LHD (NS), South Eastern Sydney LHD (SES), Sydney LHD (Syd), Western Sydney LHD (WS). Central Coast LHD (CC) did not report any outbreaks this quarter.

Table 6. Outbreaks of gastroenteritis in institutions reported in NSW, quarter 4 2017, by facility type

Setting	No of Outbreaks (n)	Staff Affected (n: attack rate)	Non-staff affected (n: attack rate)	Average duration of outbreak (days)	Outbreaks with stool collected (n: %)	Outbreaks with pathogen found (n: pathogen found)
ACF	73	281: 5.7%	1,150: 23.4%	7.1	56: 77%	30: norovirus & 5: rotavirus
CCC	131	276: 14.2%	1,101: 10.3%	10.0	13: 10%	1: norovirus & 3: rotavirus
Hospital	11	38: 10.6%	76: 37.2%	7.0	11: 100%	7: norovirus
Other	2	1: 10.0%	18: 13.0%	5	0: 0%	-
Total	217	596: 11.2%	2,345: 15.9%	8.5	80: 37%	38: norovirus & 8: rotavirus

(ACF= aged care facility, CCC= child care centre, Other= School)