

OzFoodNet—Enhancing Foodborne Disease Surveillance across Australia

Third Quarter Summary, July – September, 2017 NSW

NSW OzFoodNet



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Highlights Quarter 3, 2017

Introduction

This report describes data for enteric conditions for quarter 3, 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 third quarter of 2017, hepatitis A and rotavirus cases were three times above the five year quarterly averages for the same period, and Shiga toxin-producing *Escherichia coli* (STEC) cases were double the five year quarterly average (Table 1). Smaller increases compared to the five year quarterly average were reported for typhoid, shigellosis and cryptosporidiosis (Table 1). There were no cases of haemolytic uraemic syndrome (HUS) reported in quarter 3 and there was only one hepatitis E case, a decrease of 72% below the five year quarterly average for hepatitis E (Table 1). Smaller decreases compared to the five year quarterly average were reported for listeriosis, salmonellosis and giardiasis. The long term trends for the 12 notifiable enteric conditions in NSW are shown in Figures 1-3.

There were 34 cases of **hepatitis A** in quarter 3 of 2017, of which 27 were locally acquired, a marked increase over the five year quarterly average of 0.8 locally acquired cases (Table 2). An outbreak investigation commenced and found that 25 cases of the locally acquired cases and two of the other cases were linked – all were genotype (IA) and shared an identical common partial genome sequence. The sequence of this NSW outbreak strain is very similar to the VRD_521_2016 strain currently causing a large, multi-country outbreak in Europe, predominantly among men who have sex with men (MSM). Most of the local outbreak cases occurred in metropolitan

Sydney, particularly in residents of the Sydney and South Eastern Sydney local health districts (LHD). All but one of the outbreak cases were adult males, with 48% being MSM. There is evidence of person to person transmission, with four secondary cases identified (two sexual and two household contacts). Despite extensive investigation by the public health units and NSW Food Authority, no food item has been found in common with all the cases. Three outbreak cases were food handlers who had worked while infectious, however joint assessment by the public health units and NSW Food Authority assessed each case as being of negligible risk of transmission to patrons. No secondary cases were identified among patrons or staff at these venues. Control measures have been developed and implemented in collaboration with community-based sexual health organisations (ACON and Positive Life), including a campaign to raise awareness of the outbreak and encourage high risk groups (particularly MSM) to get vaccinated against hepatitis A. Outbreak control measures are continuing.

There were 1,120 cases of **rotavirus** infection in quarter 3 of 2017, almost triple (199% increase) the five year quarterly average of 374 cases. This was the highest number of rotavirus notifications of any single quarter since 2012. The increase in rotavirus activity occurred in all LHDs except Western NSW LHD. Increases in rotavirus were also seen in other Australian States and Territories in this quarter. Rotavirus was the causative pathogen in 22 institutional outbreaks in NSW (11 in aged care facilities and 11 in child care centres), accounting for 10% of all institutional outbreaks where stool samples were collected (Table 6). A sample of rotavirus strains from cases reported in this quarter were genotyped by the Murdoch Children's Research Institute as part of the Australian Rotavirus Surveillance Program. Genotypes equine-like G3P[8] and G8P[8] were the major rotavirus strains circulating in NSW in quarter 3. This is the first instance of G8 becoming a major genotype in Australia. This pattern was the same across all the age groups, except for cases aged 0-6 months and under, where the vaccine (Rotarix)-like strain was the predominant genotype. The detection of Rotarix-like strains may not indicate infection with

these strains of vaccine, but instead excretion of the vaccine strain following recent vaccination. 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 course must be completed by 24 weeks of age. The vaccine is approximately 70% effective for any rotavirus infection and 85-100% effective for severe rotavirus infection.

There were eight cases of **STEC** in quarter 3 of 2017, double the number predicted by the five year quarterly average. The majority of infections occurred in Western Sydney LHD. All cases were investigated and there were no apparent connections between these cases and no indication of a common source. Of the eight cases, only one infection was acquired overseas. The three typed STEC isolates were all serogroup O157. There were no cases of HUS in this quarter.

There were ten cases of **typhoid** infections in quarter 3 in 2017, 67% higher than the five year quarterly average for this period. All ten cases were overseas acquired, predominantly among travellers to Bangladesh and India.

There were 541 cases of **salmonellosis** reported in quarter 3 of 2017, 13% lower than the five year quarterly average of 624 cases. *Salmonella* Typhimurium continued to decline in quarter 3, with almost half the number of cases compared to five year quarterly average (n=121, 52% lower than the 5 year quarterly average). The number of *Salmonella* Enteritidis cases also declined slightly in quarter 3 (n=47, 4% lower than the five year quarterly average). Notable *Salmonella* serotype increases in quarter 3, compared to the five year quarterly average included *S. ser 4,5,12:i:-*, (24 cases; 95% increase), *S. Stanley* (21 cases; 139% increase) and *S. Wangata* (12 cases; 131% increase). Detailed analysis of *Salmonella* notifications is described on page 8.

Six **foodborne or suspected foodborne outbreaks** were reported affecting 123 people (Table 1), of whom one was hospitalised (Table 4). A pathogen (norovirus) was identified for one outbreak, but the food agent was unknown. There was an epidemiological association of illness with ready-to-eat sandwiches in one outbreak but no pathogen was identified. The food sources and causative pathogens of the remaining outbreaks are unknown (Table 4).

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

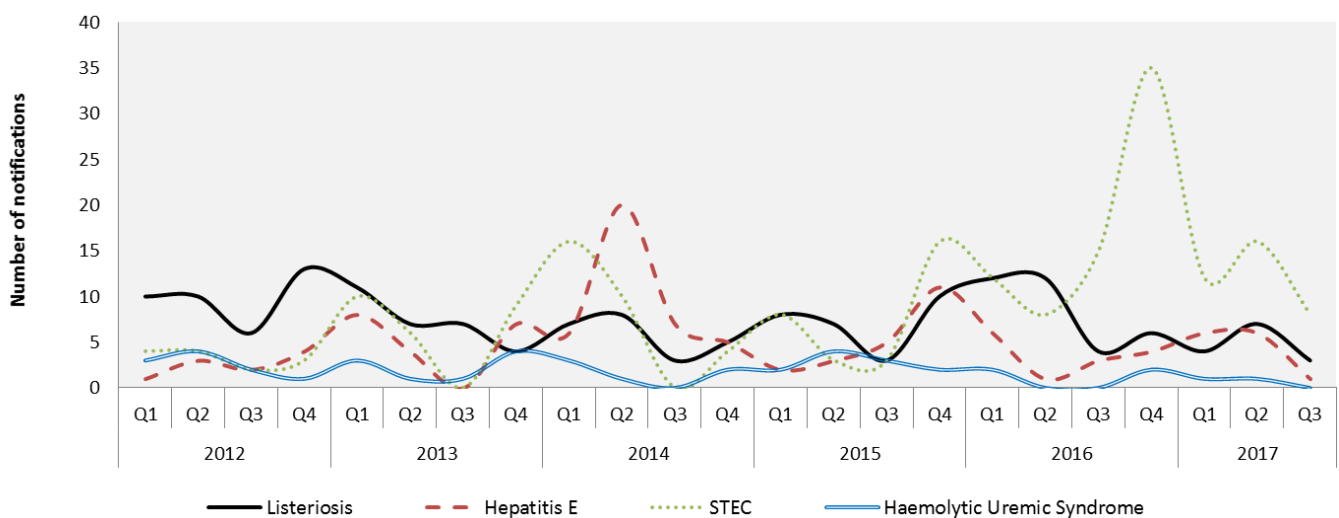
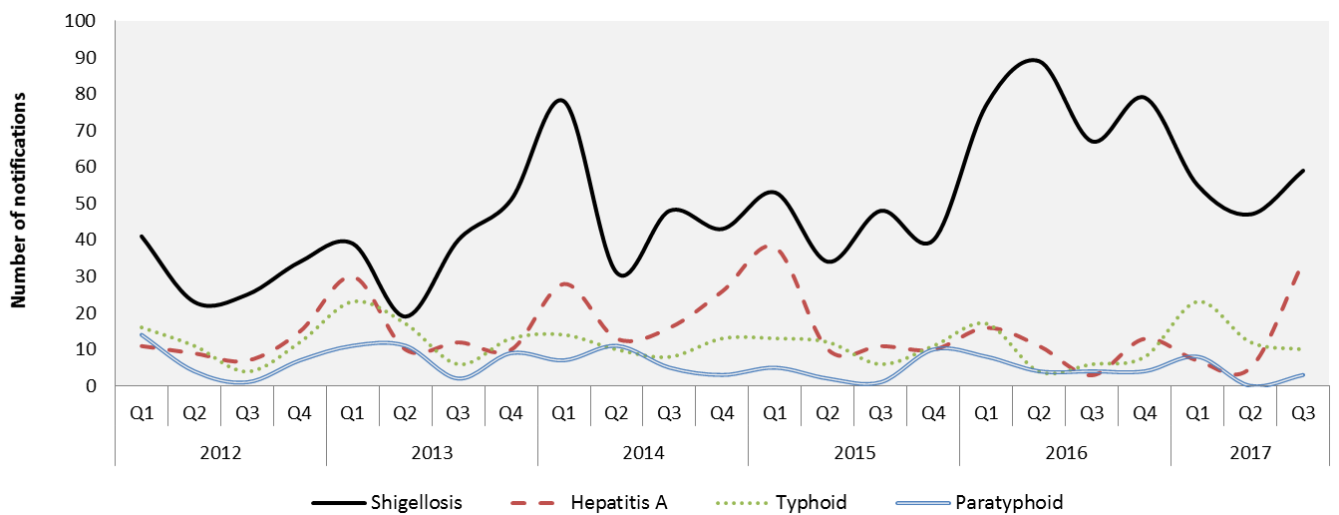
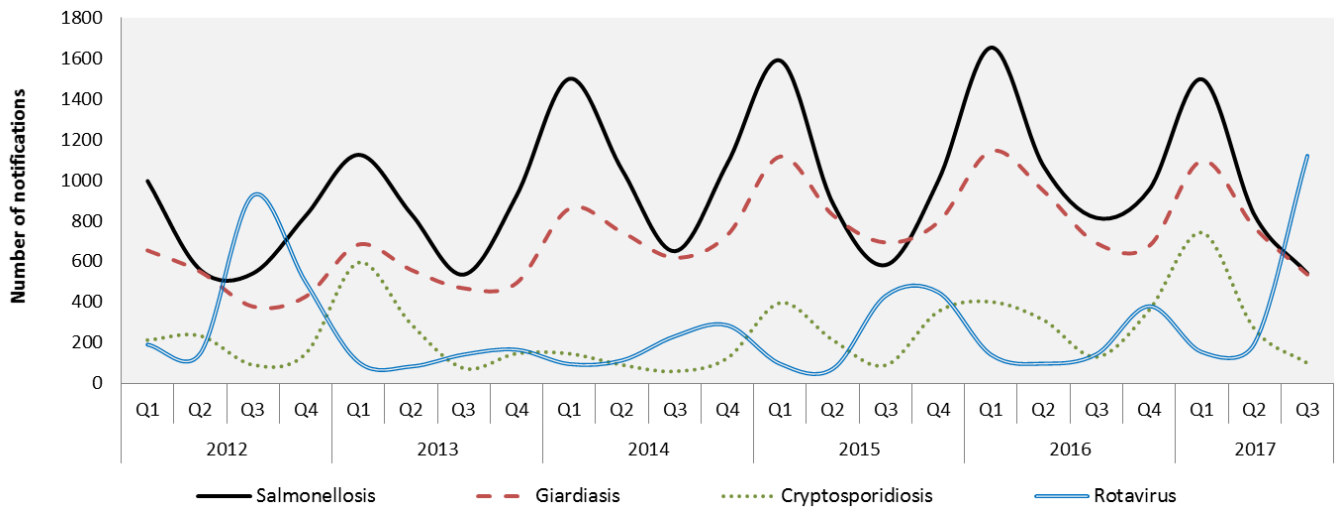


Table 1. Notifiable enteric conditions, quarter 3 2017, by Local Health District

Notifiable Disease		CC	FW	HNE	IS	M	MNC	NBM	NNSW	NS	SES	SNSW	SWS	Syd	WNSW	WS	NSW
Botulism	Notified, Q3 2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q3 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, Q3 2017	3	0	12	10	5	2	1	4	28	10	1	4	6	5	8	99
	5 y Q3 mean, 2012-2016	2.0	0.0	11.2	5.6	4.6	3.2	3.2	4.8	11.8	15.2	2.0	4.8	8.2	3.6	8.4	88.6
Giardiasis	Notified, Q3 2017	29	1	68	34	15	19	25	33	84	75	11	26	43	19	54	536
	5 y Q3 mean, 2012-2016	21.2	1.0	73.4	34.4	22.6	12.4	26.0	19.4	91.8	102.4	9.8	31.4	49.6	28.8	45.6	570.0
Hepatitis A	Notified, Q3 2017	2	0	3	1	0	0	0	0	3	11	0	3	7	0	4	34
	5 y Q3 mean, 2012-2016	0.4	0.0	1.0	0.4	0.0	0.4	1.0	0.4	0.8	1.2	0.4	0.8	1.2	0.0	1.8	9.8
Hepatitis E	Notified, Q3 2017	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	5 y Q3 mean, 2012-2016	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	1.0	0.6	0.0	1.2	3.6
Listeriosis	Notified, Q3 2017	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	3
	5 y Q3 mean, 2012-2016	0.6	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.6	0.6	0.2	1.0	0.4	0.0	0.8	4.6
Rotavirus	Notified, Q3 2017	40	2	105	24	24	5	34	79	196	158	6	162	99	23	163	1120
	5 y Q3 mean, 2012-2016	11.2	2.0	40.6	19.8	6.0	3.2	22.6	17.0	46.0	46.4	3.8	41.0	23.8	28.8	61.6	374.0
Salmonellosis	Notified, Q3 2017	16	1	72	28	25	18	23	27	78	60	9	67	35	25	57	541
	5 y Q3 mean, 2012-2016	24.0	2.6	64.0	32.4	21.4	20.2	26.4	35.4	96.2	83.2	15.0	65.2	57.2	13.0	68.0	624.4
Shigellosis	Notified, Q3 2017	0	0	2	0	0	0	1	0	8	18	0	6	18	0	6	59
	5 y Q3 mean, 2012-2016	3.0	0.2	1.8	1.4	0.0	0.6	1.2	1.0	7.6	11.2	0.8	3.2	10.4	0.6	2.6	45.6
STEC	Notified, Q3 2017	0	0	1	0	1	0	0	0	0	1	2	0	0	0	3	8
	5 y Q3 mean, 2012-2016	0.0	0.4	0.2	0.0	0.6	0.0	0.0	0.0	0.0	0.4	0.6	0.4	0.0	0.4	1.0	4.0
HUS	Notified, Q3 2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q3 mean, 2012-2016	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.4	0.2	0.2	0.0	1.2
Typhoid	Notified, Q3 2017	0	0	1	0	0	0	0	0	1	2	0	1	3	0	2	10
	5 y Q3 mean, 2012-2016	0.0	0.0	0.0	0.4	0.2	0.2	0.0	0.0	0.4	1.2	0.2	0.4	1.0	0.2	1.8	6.0
Foodborne* Outbreaks	Notified, Q3 2017	0	0	1	0	1	0	0	0	0	2	0	1	1	0	0	6
	People affected	0	0	32	0	6	0	0	0	0	45	0	16	24	0	0	123
Salmonella Cluster	Notified, Q3 2017	1	0	9	6	2	3	2	2	5	6	3	9	5	1	5	11 [†]
	People affected	1	0	17	8	2	3	5	2	18	25	5	16	9	2	14	129 [†]

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. †NSW totals include multi-LHD outbreaks and therefore do not equal the sum of LHD 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 3 2017

Notifiable Disease	Place infection acquired	NSW, Q3 2017	5 year Q3 mean 2012-2016	2017 % change
Hepatitis A	Locally acquired	27	0.8	3 275%
	Overseas acquired	7	8.8	-20%
	Unknown	0	0.2	-100%
Hepatitis E	Locally acquired	0	1.6	-100%
	Overseas acquired	1	1.6	-38%
	Unknown	0	0.2	-100%
S. Enteritidis	Locally acquired	6	3.8	58%
	Overseas acquired	40	37.2	8%
	Unknown	1	7.8	-87%
Paratyphoid	Locally acquired	0	0	0%
	Overseas acquired	3	2.6	15%
	Unknown	0	0	0%
Shigellosis	Locally acquired	31	16.2	91%
	Overseas acquired	25	20.4	23%
	Unknown	3	9	-67%
STEC	Locally acquired	6	3	100%
	Overseas acquired	1	0.2	400%
	Unknown	1	0.8	25%
Typhoid	Locally acquired	0	0.2	-100%
	Overseas acquired	10	5.6	79%
	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 3 2017

PHU ID	Month [#]	Setting	Agent responsible	No. ill	Lab confirmed	No. Hospitalised	Evidence	Responsible vehicles	Contributing factors
LIV56141	Jul	restaurant	Unknown	16	0	0	D	Unknown	Unknown
M55993	Jul	restaurant	Unknown	6	0	0	D	Unknown	Unknown
SES56110	Jul	restaurant	Unknown	32	0	0	D	Unknown	Unknown
HUN	Aug	Commercial caterer	Norovirus	32	2	1	A	Unknown	Unknown
SES56982	Sep	restaurant	Unknown	13	0	0	D	Unknown	Unknown
SYD56362	Aug	commercial caterer	Unknown	24	0	0	D	Sandwiches	Contamination of ready-to-eat foods

[#]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:

- Complaints can lead to the identification of food safety issues and corrective action being taken
- Viral gastroenteritis is easily spread by unwell function attendees (foodhandlers or guests) to others through contaminated food or shared equipment

Suspected foodborne outbreak at a restaurant

On 26 September 2017, South Eastern Sydney LHD received two complaints of gastrointestinal illness affecting patrons of the same restaurant. The complainants were different members of the same group attending a birthday dinner.

The public health unit interviewed both complainants, who reported that 13 of 23 (57%) patrons had gastroenteritis symptoms (diarrhoea, abdominal cramps, nausea, vomiting and fever) an average of 28 hours (range 24-32 hours) after dinner. The duration of symptoms ranged from 24 hours to more than 3 days (one complainant was still ill at the time of interview). A stool specimen collected from one case did not detect bacterial pathogens.

All items from the banquet were shared among the group. These included dips (hummus, baba ghanoush), toubouleh, falafel, kofta, chicken and stuffed vine leaves. Inspection of the premises by local council revealed significant hygiene issues around kitchen cleanliness and some evidence of pest activity. NSW Food Authority and the local council worked with the restaurant to rectify issues and there is no ongoing public health risk.

Gastroenteritis outbreak at a catered seminar

On 3 August 2017, Sydney LHD received a complaint of gastrointestinal illness affecting attendees of a seminar at a university which had been catered by a café on campus. The public health unit distributed an online questionnaire to 30 attendees, of which 24 (80%) responded. Seventeen (71%) had gastroenteritis symptoms (fever, abdominal cramps, nausea, vomiting, diarrhoea) starting 11 hours (range 5-24 hours) after consuming sandwiches and wraps served at the seminar. The median duration of symptoms

was 64 hours. None of the cases sought medical attention, and no stool samples were collected.

The public health investigation was unable to identify any ingredient from the sandwiches or wraps as significantly associated with illness. Inspection of the café by the NSW Food Authority did not identify any hygiene issues or ill food handlers. In addition, there had not been any complaints of illness from clients of six other functions which had also been catered by the café on the same day. As such, the cluster is unlikely to have been related to the catering. Instead, the cluster was more likely caused by an infectious person, possibly a guest, with a unknown gastrointestinal infection who may have unknowingly contaminated shared food or the environment.

Norovirus outbreak at a work function

On 8 August 2017, Hunter New England LHD was notified of gastroenteritis cases in attendees following a catered work function. The public health unit distributed an online questionnaire to 227 of the 240 function attendees, which was completed by 180 attendees (79%).

Thirty-two people (18%) reported diarrhoea, abdominal pain and vomiting 33 hours (range 12-61 hours) after the event. The median duration of symptoms was two and a half days (59 hours). Three cases reported secondary illness in household contacts. Stool specimens from two cases were positive for norovirus genotype GII.P16/GII.4. This is a newly emerging strain of norovirus which has been detected overseas, but not previously reported in Australia.

Univariate analysis identified ravioli as being statistically associated with illness (risk ratio 6.1, 95%CI 2.24-16.7, $p < 0.0005$). However, inspection of the premises did not identify any procedural issues, hygiene concerns or sick food handlers to explain how the food became contaminated. As such, despite this statistical association, it is thought that the cluster was more likely caused by an infectious person with norovirus who may have contaminated the food or shared equipment.

Salmonella spotlight

There were 541 notifications of salmonellosis between 1 July and 31 September 2017, accounting for 22% of all enteric notifications. This represents a 13% decline in the number of *Salmonella* infections when compared to five year quarterly average of 624 cases. The top ten *Salmonella* serotypes are shown in Figure 4.

The most common serovar was *Salmonella* Typhimurium at 22% (n=121) of the total *Salmonella* notifications, which is almost half (52% below) the five year quarterly average of 252 *Salmonella* Typhimurium cases. There has been an overall decline in the number of *Salmonella* Typhimurium cases since 2012 (Figure 5). *Salmonella* Typhimurium MLVA profile 4-15-11-0-490 was most prominent, accounting for 5.6% of all typed isolates (Table 4).

Salmonella Enteritidis was the second most common serovar making up 9% 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=47) in this quarter was 4% below the five year quarterly average of 49 cases. All cases of *Salmonella* Enteritidis are investigated. 13% (n=6) of the *Salmonella* Enteritidis cases were locally acquired in this quarter (Table 2). There were no obvious connections between these cases and no indication of a common source.

The next most common serovars, *Salmonella* Paratyphi B by Java, *Salmonella* ser 4,5,12:i:-, and *Salmonella* Stanley, all increased in quarter 3 compared to the five year quarterly average (by 3%, 95% and 139% respectively). Other serotypes more than doubling their five year quarterly average included *Salmonella* Havana (5 cases, 213% increase), *Salmonella* Wangata (12 cases, 131% increase), *Salmonella* Mbandaka (6 cases, 131% increase), *Salmonella* Barielly (9 cases, 125% increase), and *Salmonella* Panama (3 cases, 114% increase).

Figure 4. Proportion of *Salmonella* serovars, quarter 3 2017 (N=541)

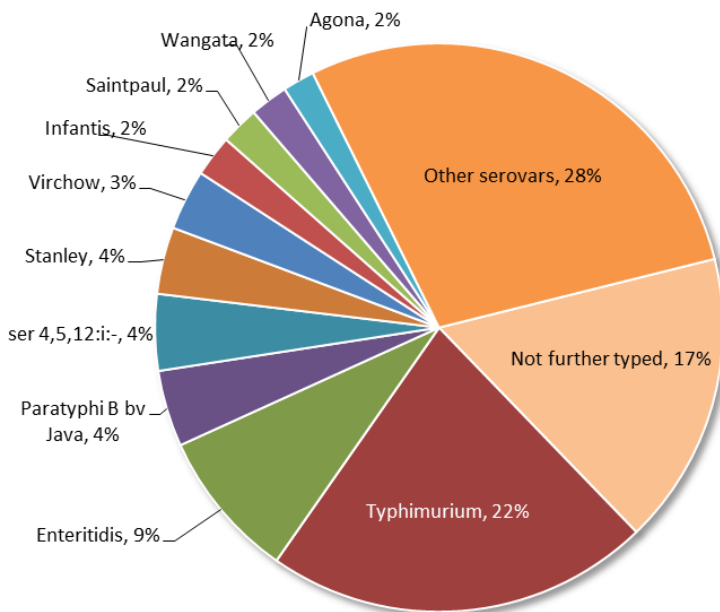
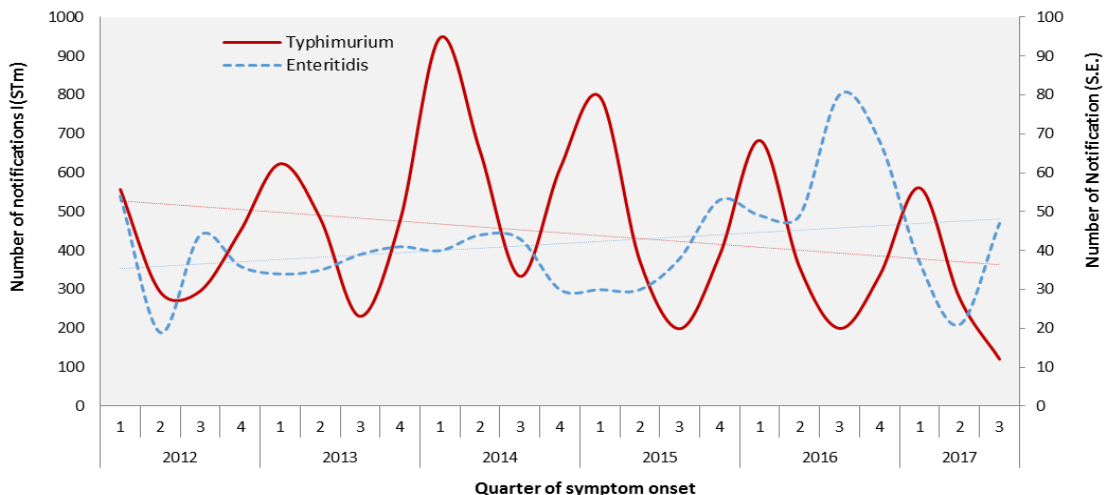


Table 4. Top 12 *Salmonella* Typhimurium MLVAs, quarter 3 2017

MLVA	Notifications	% of <i>S. Tm</i> typed
4-15-11-0-490	9	5.6%
3-12-12-9-523	6	3.8%
3-23-14-11-523	6	3.8%
3-25-15-10-523	6	3.8%
3-26-13-11-523	5	3.1%
1-10-0-0-463	4	2.5%
2-12-0-0-385	4	2.5%
3-12-12-8-523	4	2.5%
3-12-13-9-523	4	2.5%
2-6-0-0-490	3	1.9%
3-12-12-10-523	3	1.9%
3-14-11-9-523	3	1.9%
Top 12 total	57	35.6%

Figure 5. Trends for *Salmonella* Typhimurium and *Salmonella* Enteritidis in NSW, 2012-2017, by quarter (linear trend lines)



Whole Genome Sequencing: *S. Typhimurium*

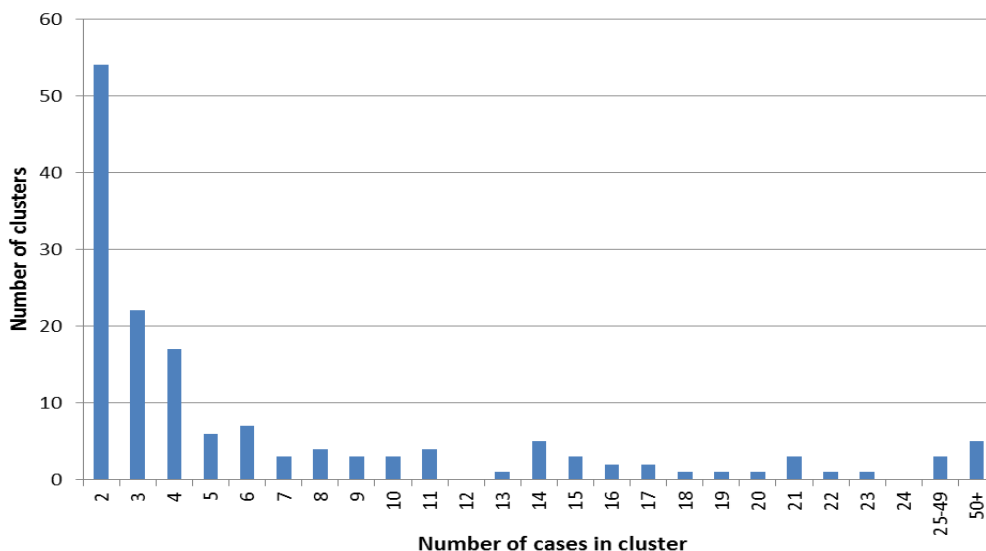
All *Salmonella* Typhimurium cases in NSW with specimen collection dates after 1 October 2016 undergo whole genome sequencing (WGS) as part of a two year translational research grant project.

In quarter 3 2017, 171 specimens from NSW residents were submitted for whole genome sequencing, for which 169 results were available (99% of all *Salmonella* Typhimurium isolates submitted for sequencing). Of these, 26 clusters were detected, affecting 101 people (60%). The clusters ranged in size from two to nine cases, with a median cluster size of three cases. An additional 24 isolates from this quarter clustered with isolates collected between 12 October 2016 and 30 June 2017.

During this quarter, turnaround time between specimen collection and receipt of genomic cluster report continued to fall. The median turnaround time was 24 days (range 16-46), compared to a median of 30 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. 22 clusters were examined in more detail, of which fourteen proceeded to investigation, and the remaining nine were monitored. No common food sources or environments were identified as a result of the investigations.

Figure 6. Number of cases in each *Salmonella* Typhimurium WGS cluster, from 1 October 2016 to 30 September 2017



Gastroenteritis Outbreaks in Institutions

From 1 July to 30 September 2017, a total of 459 outbreaks of suspected viral gastrointestinal illness in institutions were reported in NSW affecting at least 7,670 people (Table 6). This is more than double the average number of outbreaks reported during the same quarter from 2012 to 2016 (n=218, 111% increase), and an even greater increase in the mean number of people affected as a result of the gastroenteritis outbreaks (n=3,506, 119% increase).

Of the 459 outbreaks, 211 (46%) occurred in child care centres, 203 (44%) in aged care facilities, 35 (8%) in hospitals and ten (2%) in other facilities (Table 6). The number of outbreaks was higher in all types of facilities during quarter 3, with the greatest increase in child care centre outbreaks at more than double the five year quarterly average (154% increase, Figure 7). This was largely driven by an increase in rotavirus outbreaks, as the number of norovirus outbreaks remained low.

Overall, 9.8% of staff members and 19.2% of non-staff became sick during gastroenteritis outbreaks (attack rate) in quarter 3 (Table 6). The highest attack rate for gastrointestinal disease for staff was in child care centres (13.5%) and for non-staff was in hospital wards (42.1%). Outbreaks lasted 8 days on average; shortest in hospitals (6 days) and longest in child care centres (10 days) (Table 6).

One or more stool samples were collected in 214 (47%) of the outbreaks. Norovirus was identified in 132 (62%) of these outbreaks and rotavirus was identified in 22 (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 7. Number of reported outbreaks of gastrointestinal illness in institutions, quarter 3 2017 compared to the 5 year quarterly average, by month and facility type

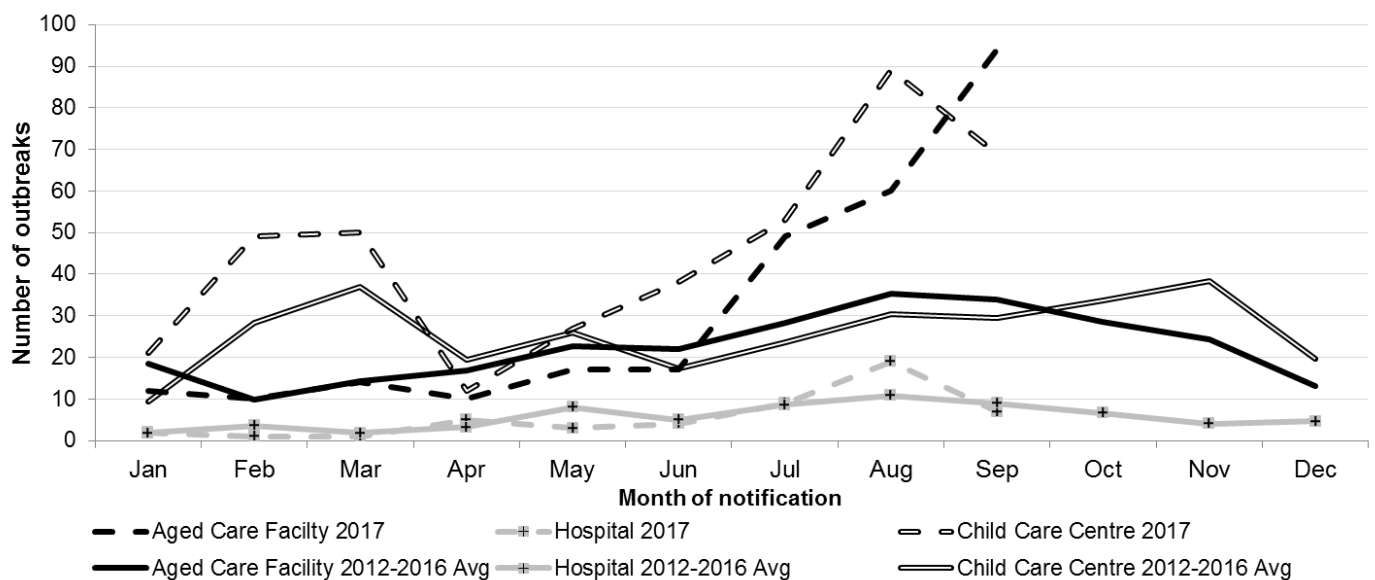


Table 5. Outbreaks of gastroenteritis in institutions reported in NSW, quarter 3 2017, by Local Health District

Facility type	Q3 2017	CC	FW	HNE	IS	M	MNC	NBM	NNWS	NS	SES	SNSW	SWS	Syd	WNSW	WS	NSW
ACF	No. of outbreaks	1	1	29	15	11	2	7	1	29	38	4	34	11	0	20	203
	Staff affected	0	0	176	125	37	0	29	24	68	124	17	150	36	0	67	853
	Non-staff affectedd	5	43	525	294	99	12	163	69	567	760	59	762	197	0	333	3888
CCC	No. of outbreaks	0	0	33	14	8	2	39	0	17	21	2	10	13	0	52	211
	Staff affected	0	0	64	33	8	1	103	0	60	52	5	16	21	0	67	430
	Non-staff affectedd	0	0	296	124	83	12	407	0	215	261	32	70	146	0	294	1940
Hospital	No. of outbreaks	0	2	1	4	1	0	3	0	4	4	1	7	3	2	3	35
	Staff affected	0	0	3	10	9	0	26	0	23	20	2	28	5	15	13	154
	Non-staff affectedd	0	5	12	31	9	0	37	0	34	31	6	66	25	22	19	297
Other	No. of outbreaks	0	0	2	0	1	0	0	0	1	2	1	0	1	0	2	10
	Staff affected	0	0	0	0	10	0	0	0	0	2	5	0	5	0	8	30
	Non-staff affectedd	0	0	12	0	16	0	0	0	7	25	2	0	2	0	14	78

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 6. Outbreaks of gastroenteritis in institutions reported in NSW, quarter 3 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	203	853: 5.8%	3,888: 23.8%	6.5	158: 78%	100: norovirus & 11: rotavirus
CCC	211	430: 13.5%	1,940: 11.6%	10.0	23: 11%	4: norovirus & 11: rotavirus
Hospital	35	154: 9.7%	297: 42.1%	6.0	30: 86%	25: norovirus
Other	10	7: 12.9%	78: 27.4%	6.5	3: 30%	3: norovirus
Total	459	1,467: 9.8%	6,203: 19.2%	8	214: 47%	132: norovirus & 22: rotavirus

(ACF= aged care facility, CCC= child care centre, Other= Mental health facility, school, residential facility)