

OzFoodNet—Enhancing Foodborne Disease Surveillance across Australia

Second Quarter Summary, April – June, 2017 NSW

NSW OzFoodNet



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Highlights Quarter 2, 2017

Introduction

This report describes data for enteric conditions for quarter 2, 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 second quarter of 2017, the most notable increases were for Shiga toxin-producing *Escherichia coli* (STEC/VTEC) (110% increase compared to the five year quarterly average for the same period) and rotavirus (94% increase above the five year quarterly average for the same period). Smaller increases compared to the five year quarterly average were reported for shigellosis, cryptosporidiosis and typhoid (Table 1). Hepatitis A and haemolytic-uraemic syndrome (HUS) decreased by 53% and 50% respectively compared to the five year quarterly average (Table 1). Smaller decreases compared to the five year quarterly average were reported for listeriosis and hepatitis E. The long term trends for the 12 notifiable enteric conditions in NSW are shown in Figures 1-3.

The majority of **STEC/VTEC** infections occurred in Western Sydney Local Health District (LHD). All cases were investigated and there were no obvious connections between these cases and no indication of a common source. Of the 13 STEC cases in NSW, only one infection was acquired overseas. The three typed isolates were all serogroup O157. One case of HUS was reported in the second quarter of 2017, and was acquired overseas.

The increase in **rotavirus** activity was primarily focused on metropolitan Sydney-based local

health districts (Sydney, Northern Sydney, South Eastern Sydney, South Western Sydney and Western Sydney). This quarter represents the beginning of the rotavirus season which usually peaks in the second half of the year. Rotavirus was the confirmed pathogen in three institutional outbreaks (two in aged care facilities and one in a child care centre).

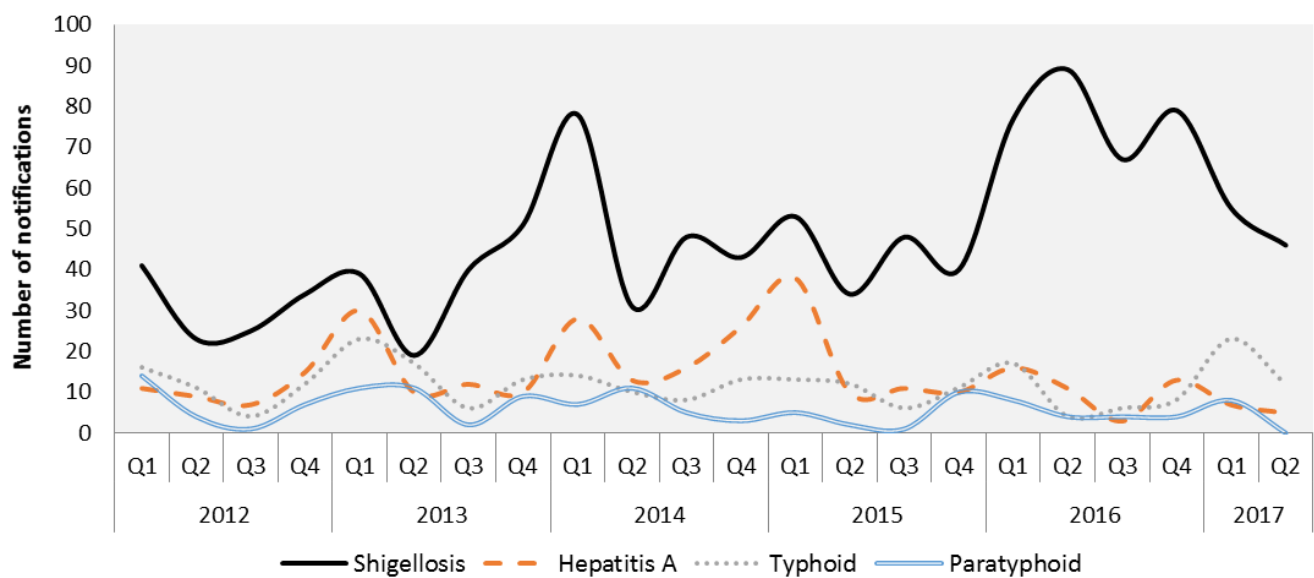
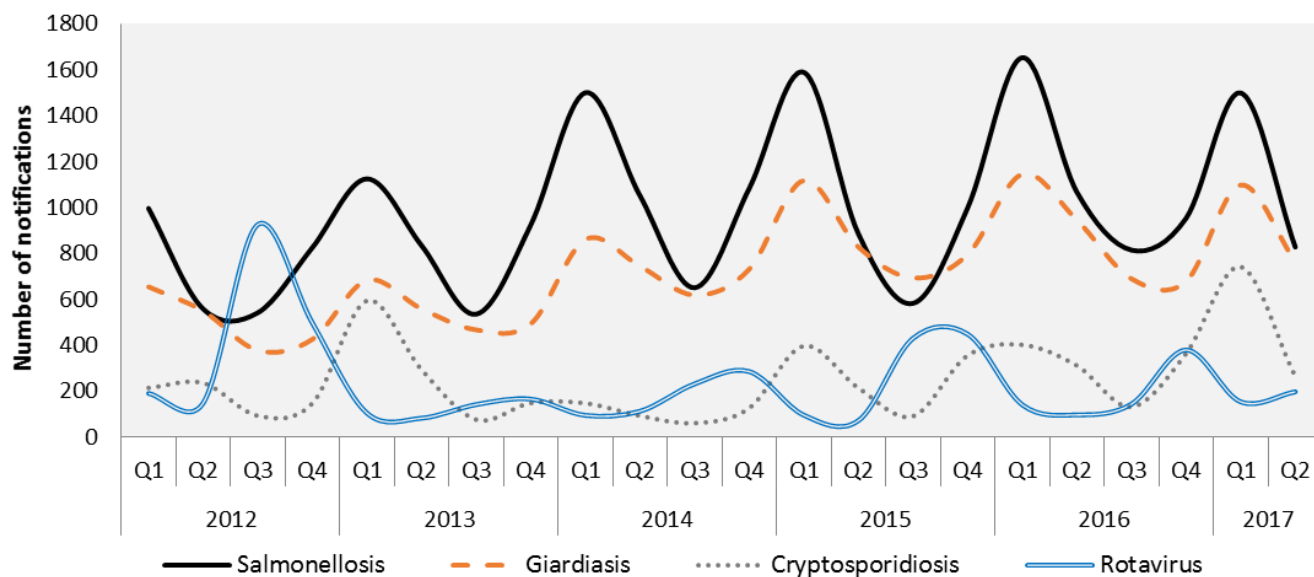
There were 827 cases of **salmonellosis** reported in quarter 2 of 2017, slightly below the 5 year quarterly average of 879 cases (decrease of 6%). *Salmonella* Typhimurium continued its decline in quarter 2 (n=278, a 36% decrease from the 5 year quarterly average of 432.2 cases). The number of *Salmonella* Enteritidis cases also declined in quarter 2 (n=21, a 41% decrease from the 5 year quarterly average of 35.4 cases). Public health units routinely follow up on all cases of *Salmonella* Enteritidis to identify and further investigate infections which are locally acquired. The primary concern is the establishment of *Salmonella* Enteritidis in commercial poultry flocks. Three of the *Salmonella* Enteritidis cases in quarter 2 of 2017 were locally acquired but no common source could be identified (Table 2). Detailed analysis of *Salmonella* notifications is described on page 6.

Five **foodborne or suspected foodborne outbreaks** were reported affecting 112 people (Table 1), of whom three were hospitalised (Table 4). In three outbreaks, a pathogen was identified, but the food agent was unknown (*Salmonella* Typhimurium, norovirus and *Campylobacter*). In one outbreak, there was an association of illness with ready-to-eat salads, however no pathogen was identified. The food source and causative pathogen of the remaining outbreak is unknown.

One other outbreak affecting 41 people was investigated as a possible foodborne outbreak but the epidemiology suggested that it was at

least in part due to person to person spread of a viral gastrointestinal pathogen (Table 4).

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



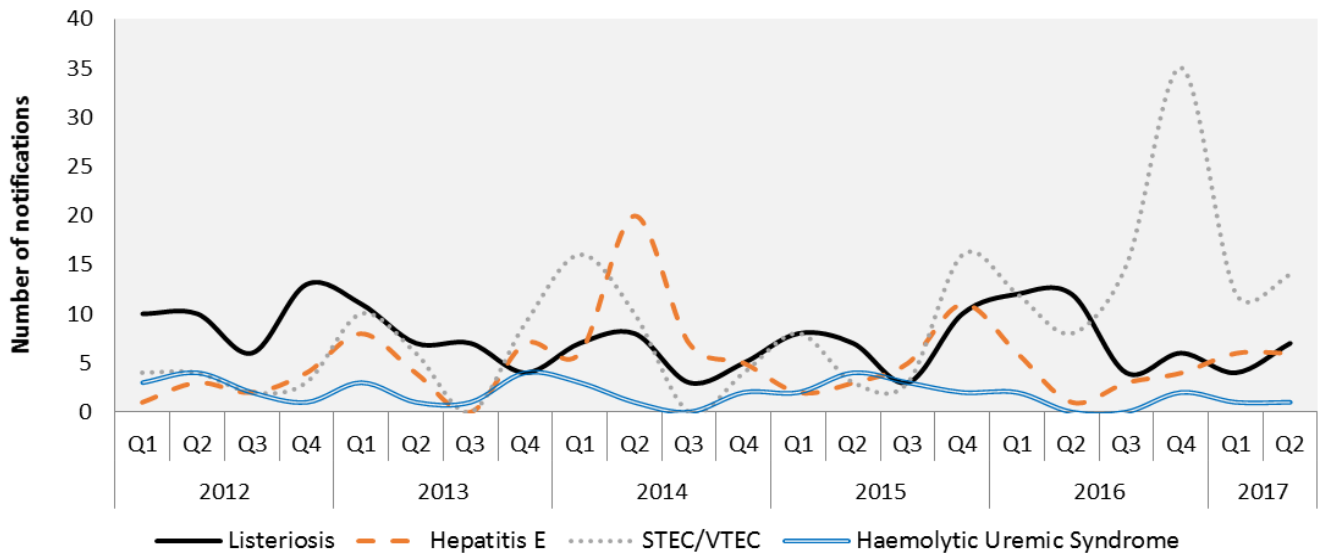


Table 1. Notifiable enteric conditions, quarter 2 2017, by Local Health District

Notifiable Disease		CC	FW	HNE	IS	M	MNC	NBM	NNSW	NS	SES	SNSW	SWS	Syd	WNSW	WS	NSW	
Botulism	Notified, Q2 2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q2 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	0.0
Cryptosporidiosis	Notified, Q2 2017	14	0	21	28	18	9	21	20	39	35	5	15	13	6	22	266	
	5 y Q2 mean, 2012-2016	13.6	0.4	22.6	10.2	6.2	8.6	9.2	13.6	36.4	39.0	4.8	14.4	20.0	9.8	19.4	228.2	
Giardiasis	Notified, Q2 2017	25	0	109	36	39	16	32	40	127	153	13	45	49	30	53	767	
	5 y Q2 mean, 2012-2016	29.2	0.6	89.6	47.0	24.4	17.8	34.2	19.2	122.8	132.6	15.0	49.6	61.6	28.0	54.0	725.6	
Hepatitis A	Notified, Q2 2017	0	0	0	0	0	0	0	2	0	0	0	1	1	0	1	5	
	5 y Q2 mean, 2012-2016	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.8	2.6	0.0	1.0	0.8	0.4	4.2	10.6	
Hepatitis E	Notified, Q2 2017	0	0	1	0	0	0	0	0	1	1	0	1	1	0	1	6	
	5 y Q2 mean, 2012-2016	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	1.6	1.2	0.0	0.8	1.0	0.0	1.8	6.8	
Listeriosis	Notified, Q2 2017	0	0	1	0	1	0	0	0	2	0	0	3	0	0	0	7	
	5 y Q2 mean, 2012-2016	0.2	0.0	0.4	0.8	0.4	0.0	0.4	0.2	1.2	1.8	0.4	1.2	0.6	0.4	0.8	8.8	
Rotavirus	Notified, Q2 2017	2	1	15	2	6	0	7	20	38	30	1	22	28	5	20	197	
	5 y Q2 mean, 2012-2016	1.4	0.0	16.2	3.8	3.4	1.2	4.8	7.0	15.2	14.2	1.6	7.4	7.6	6.6	11.2	101.6	
Salmonellosis	Notified, Q2 2017	37	3	80	41	28	47	30	79	116	105	26	75	65	22	73	827	
	5 y Q2 mean, 2012-2016	31.4	5.2	102.0	37.2	29.8	29.6	40.2	59.2	137.8	107.2	24.8	91.8	66.2	25.4	90.4	878.2	
Shigellosis	Notified, Q2 2017	3	0	1	1	0	1	1	0	2	11	1	3	16	0	6	46	
	5 y Q2 mean, 2012-2016	1.8	0.0	2.4	0.8	0.6	0.8	1.0	1.6	5.0	11.2	0.0	3.4	7.6	0.4	2.6	39.2	
STEC/VTEC	Notified, Q2 2017	1	0	1	0	2	0	0	0	0	0	2	0	0	2	5	13	
	5 y Q2 mean, 2012-2016	0.2	0.0	1.8	0.2	0.6	0.2	0.0	0.4	0.0	1.0	0.2	0.2	0.0	1.0	0.4	6.2	
HUS	Notified, Q2 2017	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
	5 y Q2 mean, 2012-2016	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.6	0.4	0.0	0.0	0.0	0.4	0.2	2.0	
Typhoid	Notified, Q2 2017	1	0	0	0	0	0	1	0	2	0	0	3	1	0	4	12	
	5 y Q2 mean, 2012-2016	0.0	0.0	0.4	0.2	0.4	0.0	0.2	0.2	1.6	1.2	0.4	1.8	0.8	0.0	3.6	10.8	
Foodborne* Outbreaks	Notified, Q2 2017	0	0	2	0	0	0	0	0	0	2	0	0	1	0	0	5	
	People affected	0	0	55	0	0	0	0	0	0	54	0	0	3	0	0	112	
Salmonella Cluster	Notified, Q2 2017	1	0	1	0	0	0	0	0	3	2	1	3	4	0	2	10 [†]	
	People affected	2	0	2	0	0	0	0	0	9	6	2	6	6	0	2	35	

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 2 2017

Notifiable Disease	Place infection acquired	NSW, Q2 2017	5 year Q2 mean 2012-2016	2017 % change
Hepatitis A	Locally acquired	2	2.8	-29%
	Overseas acquired	3	6.4	-53%
	Unknown	0	0	0%
Hepatitis E	Locally acquired	1	1.6	-38%
	Overseas acquired	5	3.2	56%
	Unknown	0	0	0%
<i>Salmonella</i> Enteritidis	Locally acquired	3	4.2	-29%
	Overseas acquired	16	27.8	-42%
	Unknown	2	2.6	-23%
Paratyphoid	Locally acquired	0	0.2	-100%
	Overseas acquired	1	6.8	-85%
	Unknown	0	0	0%
Shigellosis	Locally acquired	25	19.8	26%
	Overseas acquired	15	13.6	10%
	Unknown	6	5	20%
STEC/VTEC	Locally acquired	11	5	120%
	Overseas acquired	1	1	0%
	Unknown	1	2	-50%
Typhoid	Locally acquired	0	0.4	-100%
	Overseas acquired	12	10.8	11%
	Unknown	0	0	0%

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

Notable Foodborne Outbreaks

Campylobacter outbreak on a rural commune

On 4 April 2017, Hunter New England LHD was notified by a medical practitioner of cases of gastrointestinal illness from a rural commune of approximately 120 adults and children.

76 of the 120 commune members (63%) responded to a questionnaire. Of these, twenty (26%) adults reported diarrhoea with onset between 29 March to 2 April 2017, with a median duration of five days. Four of five stool specimens were positive for *Campylobacter*. No children were affected.

Univariate analyses did not identify a particular food item or animal exposure as being statistically associated with illness. As the meals of interest were shared (common menu, common kitchen, common dining room), the comparison of food consumption between those who were ill and those who were not ill was complicated by near universal exposure to food items.

The premises was inspected by the LHD. A review of the cooking processes identified possible undercooked chicken as the likely source of infection due to the partial frying, cooling and reheating process for the adult meals. In contrast, the children's meals consisted of smaller chicken pieces that were cooked for a longer period of time. However, there were no foods available for testing. Drinking water sources and water distribution were examined but considered to be an unlikely source of illness based on the onset dates which suggested a single point source. Agricultural and animal exposures were not found to be significantly associated with illness.

Based on epidemiological and laboratory investigations, it is thought that the cluster was likely caused by improper cooking processes resulting in undercooked chicken.

Gastroenteritis outbreak following a catered work function

On 28 June 2017, South Eastern Sydney LHD received a complaint of gastrointestinal illness affecting employees who had attended a two-day workshop in a Sydney office. The two days had been catered for by two different food outlets.

156 of approximately 180 (87%) employees completed an online questionnaire. Of these, 48 (31%) reported gastroenteritis (fever, abdominal cramps, diarrhoea and/or vomiting) with a mean onset of 36 hours after lunch on the first day of the workshop, and a median duration of 35 hours. Unfortunately, no stool samples were collected. Four employees (3%) also reported gastroenteritis in the week prior to the workshop.

Analysis of foods consumed on the first day revealed that 43 of 100 (43%) employees who consumed the catered foods were symptomatic compared with five of 56 (9%) of those who did not consume the catered foods. Four salads served by the caterer hired for the first day were significantly associated with illness. In comparison, 14 of 34 (41%) of employees who ate the catered foods on the second day became unwell compared with 33 of 118 (28%) who did not consume the catered foods. No specific foods served on the second day were found to be significantly associated with illness.

The NSW Food Authority inspected the food outlet that had catered for the first day of the workshop. No significant issues related to food production were found. In particular, there had not been any reported staff illnesses in the preceding few weeks, nor complaints of illness from other clients regarding foods catered on the same day.

Based on epidemiological investigations, it is thought that the cluster was likely caused by an infectious person with a viral gastrointestinal pathogen who was not associated with the catering but who may have contaminated the environment.

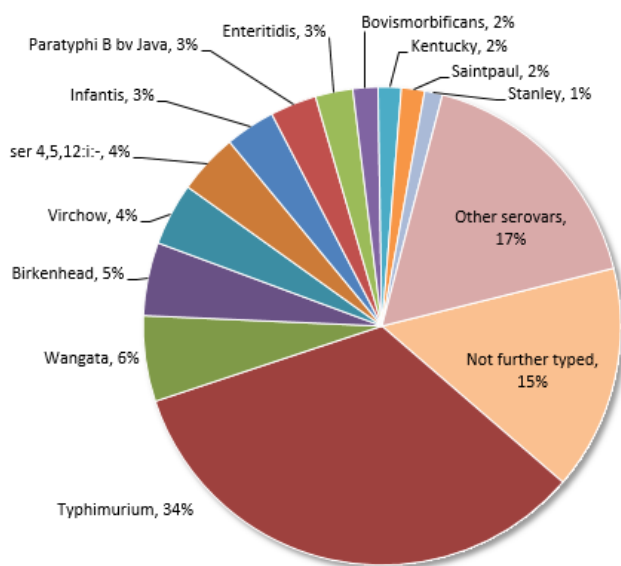
Salmonella spotlight

Salmonellosis accounted for 39% of all enteric infections reported between 1 April and 30 June 2017. 827 notifications of *Salmonella* were received in this quarter, which is 6% below the five year quarterly average (n=879). The top 12 *Salmonella* serotypes are shown in Figure 4.

The most common serovar was *Salmonella* Typhimurium at 34% (n=278) of the 827 *Salmonella* notifications in total, which is 36% below the five year quarterly average of 432.2 *Salmonella* Typhimurium cases. Since 2012, there has been an overall decline in the number of *Salmonella* Typhimurium cases (Figure 5). The most common *Salmonella* Typhimurium MLVA profile was 3-12-13-9-523, accounting for 4.3% of all typed isolates (Table 3).

The second and third most common serovars were *Salmonella* Wangata and *Salmonella* Birkenhead (6% and 5% respectively of all the *Salmonella* serovars in quarter 2). In quarter 2 2017, there were 48 cases of *Salmonella* Wangata (158% above the five year quarterly average of 18.6 cases) and 41 cases of *Salmonella* Birkenhead (144% above the five year quarterly average of 16.8 cases).

Figure 4. Proportion of *Salmonella* serovars, quarter 2 2017 (N=827)



These serovars follow an almost identical seasonal distribution (Figure 6), and are suspected to be associated with environmental exposures. Hunter New England LHD is leading a study to explore possible environmental sources for *Salmonella* Wangata.

The next most common serovars, *Salmonella* Virchow, *Salmonella* ser 4,5,12:i:-, *Salmonella* Infantis and *Salmonella* Paratyphi B bv Java, all increased in quarter 2 compared to the five year quarterly average (by 20%, 286%, 54% and 6% respectively). *Salmonella* ser 4,5,12:i:- is considered to be related to *Salmonella* Typhimurium and so is included in a NSW Health whole genome sequencing project to allow for *Salmonella* Typhimurium cluster detection (page 9).

Salmonella Enteritidis was the eighth most common serovar in quarter 2 with 21 cases, a 41% decrease compared to the five year quarterly average. Since 2012, there has been an overall increase in *Salmonella* Enteritidis infections, largely driven by the high number of cases reported in 2016 (Figure 5).

Table 3. Top 15 *Salmonella* Typhimurium MLVAs, quarter 2 2017

MLVA	Notifications	% of <i>S. Tm</i> typed
3-12-13-9-523	13	4.3%
3-24-13-10-523	12	4.0%
3-10-7-12-523	10	3.3%
3-15-10-10-523	9	3.0%
3-12-12-11-523	7	2.3%
3-17-9-11-523	7	2.3%
3-23-14-11-523	7	2.3%
3-12-12-9-523	6	2.0%
3-9-7-12-523	6	2.0%
1-9-0-0-463	5	1.7%
3-15-11-10-523	5	1.7%
3-16-9-11-523	5	1.7%
3-17-13-10-523	5	1.7%
3-22-13-10-523	5	1.7%
3-9-9-12-523	5	1.7%
Top 15 total	107	35.8%

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

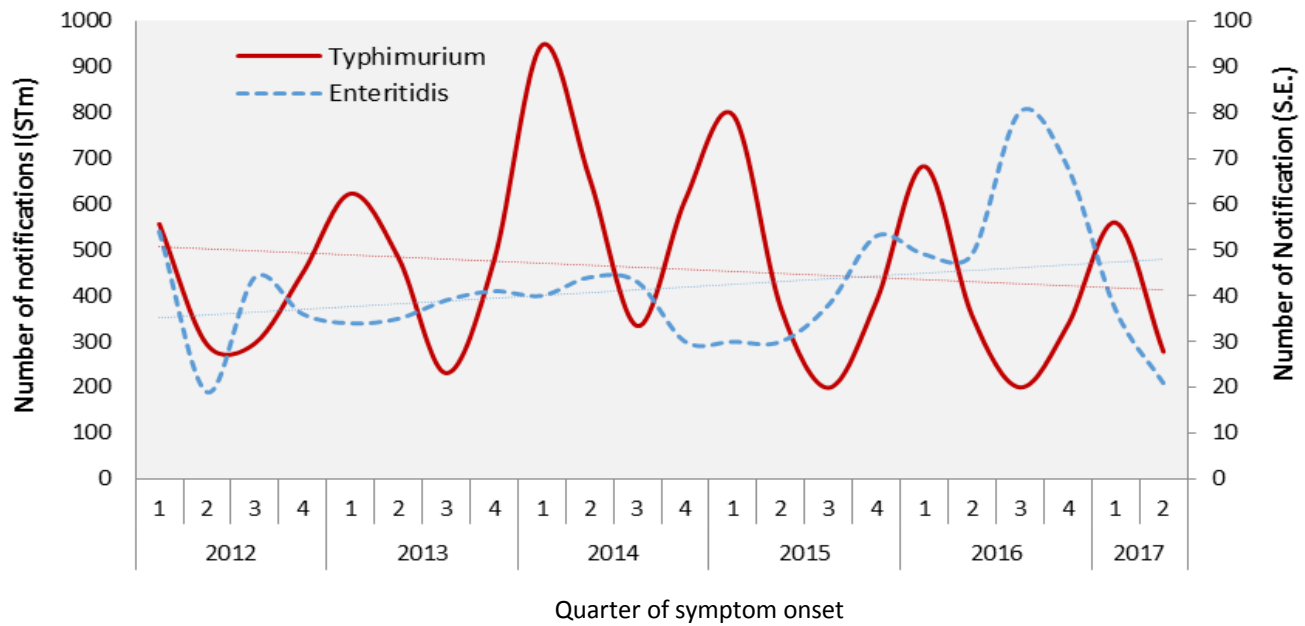
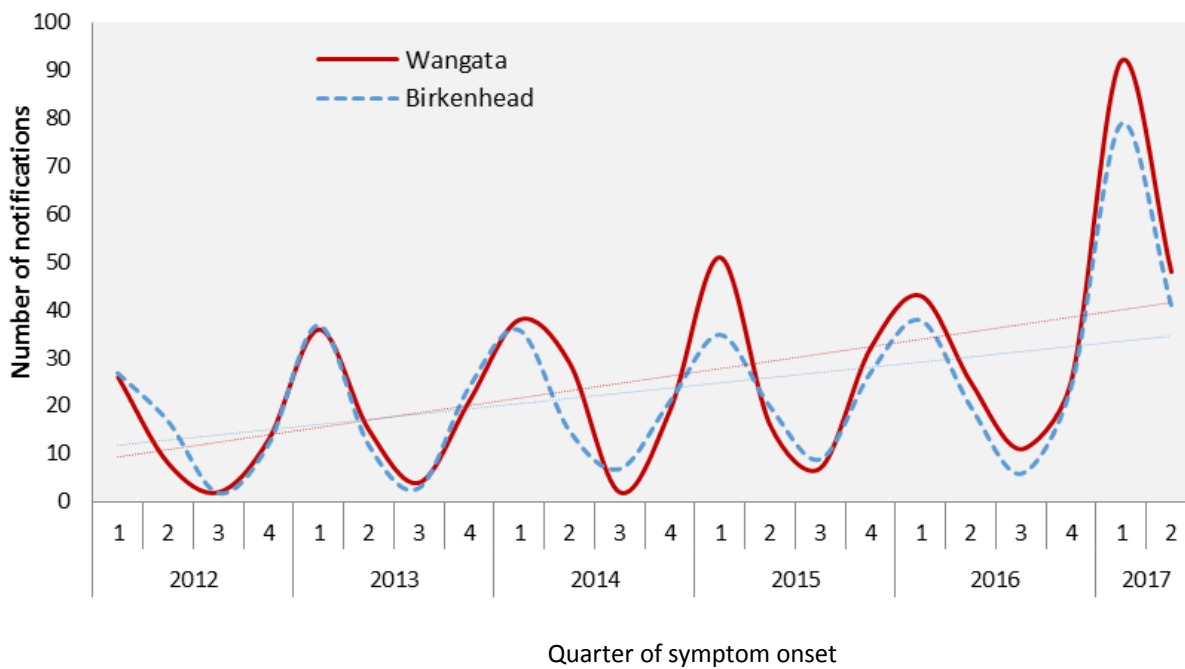


Figure 6. Trends for *Salmonella* Wangata and *Salmonella* Birkenhead in NSW, 2012-2017, by quarter



Whole Genome Sequencing: *S. Typhimurium*

All *Salmonella* Typhimurium isolates 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.

Improved laboratory protocols implemented during quarter 2 2017 reduced turnaround time from specimen collection to availability of WGS cluster results such that prospective identification and investigation of clusters was possible. The median turnaround time was 30 days (range 20-79).

In quarter 2 2017, 288 specimens from NSW residents were submitted for whole genome sequencing, for which 284 results were available (99% of all *Salmonella* Typhimurium isolates submitted for sequencing). Of these, 47 clusters were detected,

affecting 195 people (69%). The clusters ranged in size from two to sixteen cases, with a median cluster size of three cases (Figure 7). This is consistent with international experience of WGS finding more clusters of fewer cases. In addition to new clusters detected, 34 isolates collected during this quarter clustered with isolates collected in previous quarters (between 12 October 2016 and 31 March 2017).

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. Of all clusters detected, 14 clusters were triaged for further follow-up, of which five were actively investigated. No common exposures were found. The remaining nine clusters were monitored for further cases.

Figure 7. Number of cases in each *Salmonella* Typhimurium WGS cluster, from 1 October 2016 to 30 June 2017

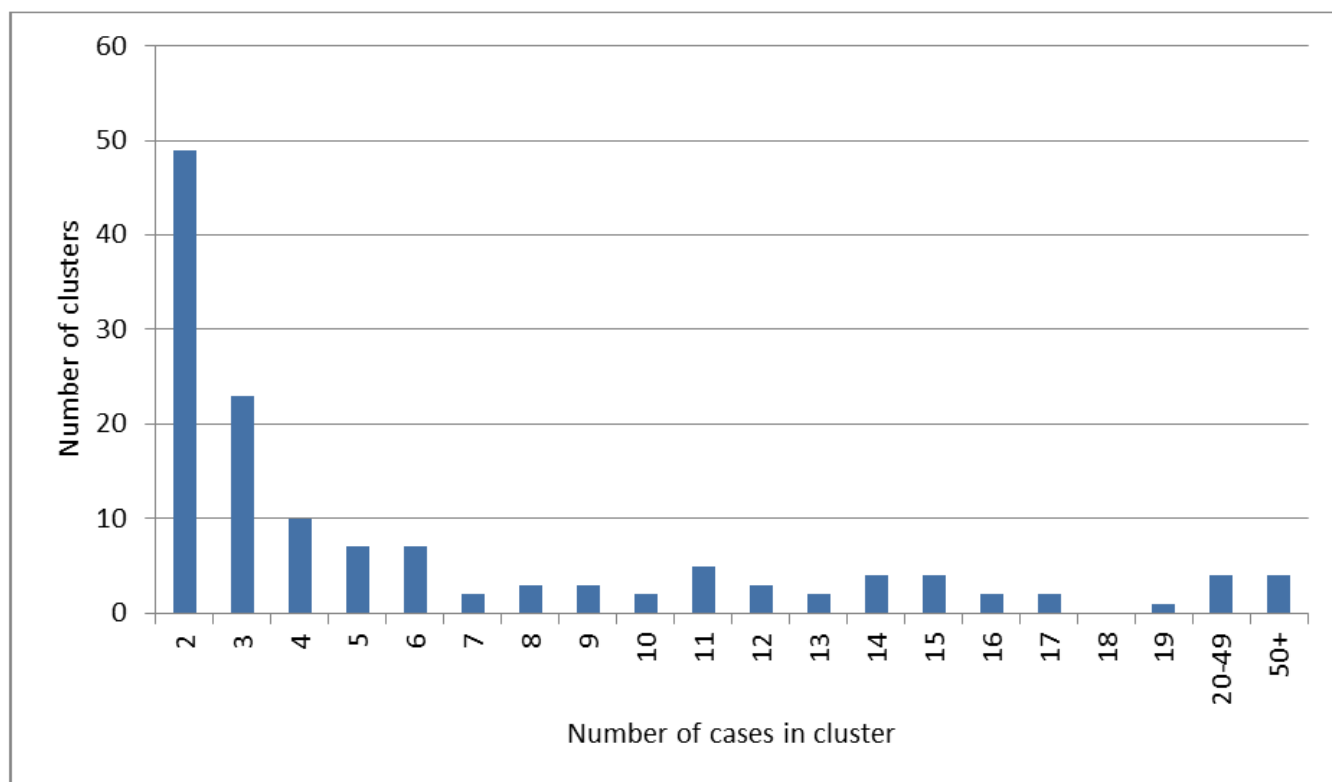


Table 4. Foodborne and Suspected foodborne outbreaks, quarter 2 2017

PHU ID	Month [#]	Setting	Agent responsible	No. ill	Lab confirmed	No. Hospitalised	Evidence	Responsible vehicles	Contributing factors
HUN0511	Apr	commune	<i>Campylobacter</i>	21	4	0	D	Unknown	Unknown
HUN0512	Jun	function	Norovirus	34	2	1	D	Unknown	person contamination of ready to eat foods
SYD54778	Apr	restaurant	Unknown	3	0	0	D	Unknown	Unknown
SES201702	Apr	picnic	<i>Salmonella</i> Typhimurium MLVA 3-24-13-10-523	6	2	2	D	Unknown	Unknown
SES201703	Jun	function	Unknown	48	0	0	A	Salads	Ill person contamination of ready to eat foods
Viral and suspected viral gastrointestinal outbreaks with likely person-to-person spread									
HUN0513	May	school	Norovirus	41	3	0	D	Unknown	Person to person

[#]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.

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.

Gastroenteritis Outbreaks in Institutions

From 1 April to 30 June 2017, a total of 139 outbreaks of suspected viral gastrointestinal illness in institutions were reported in NSW affecting at least 1,818 people (Table 6). This represents a decrease of 3% compared to the average number of outbreaks reported during the same quarter from 2012 to 2016 (n=143), and a decrease of 22% compared to the mean number of people affected as a result of the gastroenteritis outbreaks (n=2,320).

Of the 139 outbreaks, 77 (55%) occurred in child care centres, 44 (32%) in aged care facilities, 12 (9%) in hospitals and six (4%) in other facilities (Table 6). The number of child care centre outbreaks during quarter 2 was 22% higher than the five year quarterly average, but numbers of outbreaks in other facilities were slightly below average levels (Figure 8).

Overall, 10% of staff members and 15% of non-staff became sick during gastroenteritis outbreaks (attack rate) in quarter 2 (Table 6). The highest attack rate for gastrointestinal disease for staff (13%) and for non-staff (22%) was in hospital wards. Outbreaks lasted 6.5 days on average; shortest in hospitals (4.5 days) and longest in child care centres (7.5 days) (Table 6).

One or more stool samples were collected in 60 (43%) of the outbreaks. Norovirus was identified in 30 (50%) of these outbreaks and rotavirus was identified in three (5%). 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 2 2017 compared to the 5 year quarterly average, by month and facility type

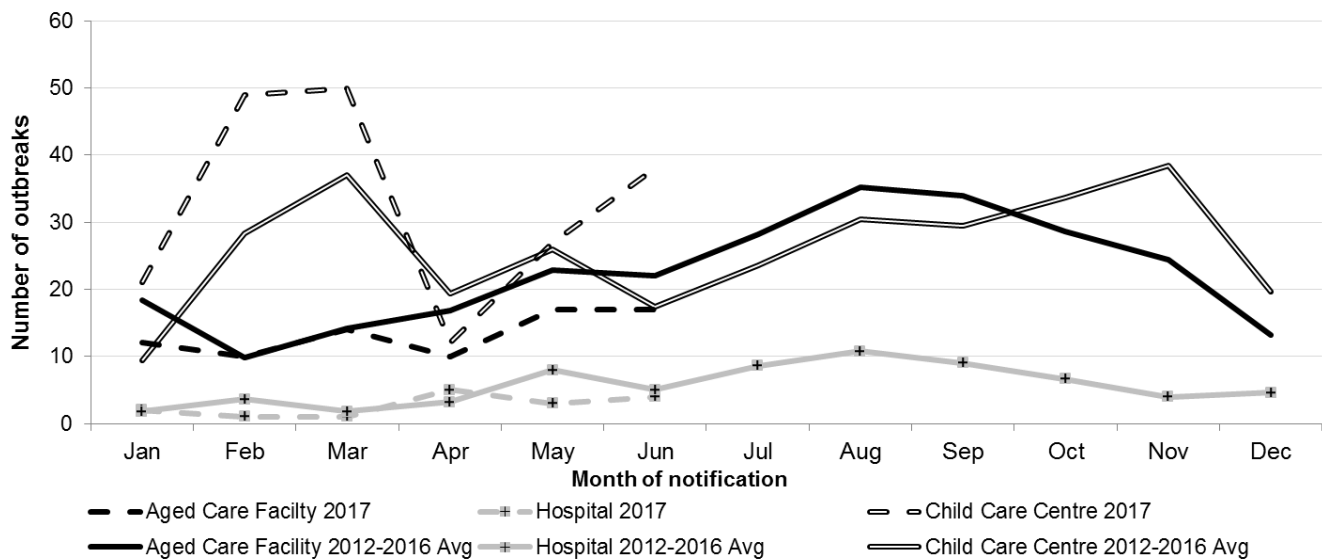


Table 5. Outbreaks of gastroenteritis in institutions reported in NSW, quarter 2 2017, by Local Health District*

Facility type	Q2 2017	HNE	IS	M	NBM	NNWS	NS	SES	SNSW	SWS	Syd	WNSW	WS	NSW
ACF	No. of outbreaks	14	2	3	6	0	5	3	2	3	3	2	1	44
	Staff affected	60	30	14	28	0	6	19	18	12	1	4	2	194
	Non-staff affectedd	136	51	44	121	0	41	46	56	27	28	33	2	585
CCC	No. of outbreaks	9	4	4	12	0	10	14	2	6	4	0	12	77
	Staff affected	23	3	4	23	0	19	13	3	9	6	0	30	133
	Non-staff affectedd	71	29	43	64	0	117	126	23	43	33	0	139	688
Hospital	No. of outbreaks	0	4	0	0	1	0	3	2	0	1	0	1	12
	Staff affected	0	18	0	0	0	0	2	14	0	0	0	7	41
	Non-staff affectedd	0	20	0	0	3	0	37	14	0	7	0	14	95
Other	No. of outbreaks	3	0	3	0	0	0	0	0	0	0	0	0	6
	Staff affected	3	0	4	0	0	0	0	0	0	0	0	0	7
	Non-staff affectedd	48	0	27	0	0	0	0	0	0	0	0	0	75

*CC, MNC & FW NSW did not report any outbreaks of gastroenteritis in institutions in this period

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 2 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	44	194: 7%	585: 20%	5.5	37: 84%	15: norovirus & 2: rotavirus
CCC	77	133: 11%	688: 11%	7.5	8: 10%	4: norovirus & 1 rotavirus
Hospital	12	41: 13%	95: 22%	4.5	11: 92%	9: norovirus
Other	6	7: 3%	75: 12%	5	4: 67%	2: norovirus
Total	139	375: 10%	1443: 15%	6.5	60: 43%	30: norovirus & 3: rotavirus

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