

# **OzFoodNet—Enhancing Foodborne Disease Surveillance Across Australia**

## **First Quarter Summary, January – March, 2017 NSW**

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NSW OzFoodNet



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# Highlights Quarter 1, 2017

## Introduction

This report describes data for enteric conditions for quarter 1, 2017. The report is divided into three sections: enteric notifiable diseases, foodborne outbreaks 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 first quarter of 2017, the most notable increase reported was for cryptosporidiosis (111% increase compared to the five year average for the same period). More moderate increases compared to the five year quarterly average were reported for giardiasis, hepatitis E, rotavirus, salmonellosis, STEC/VTEC and typhoid (Table 1). Moderate decreases were noted in Hepatitis A, listeriosis and haemolytic uraemic syndrome (HUS). The long term trends for the 12 notifiable enteric conditions in NSW are shown in Figures 1-3.

**Cryptosporidiosis** infections were more than double the five year average for quarter 1. This increase was spread across all local health districts (LHDs), except for Far West NSW LHD. Almost half of the LHDs (7/15) reported increases of over 100% when compared with the five year average. The largest increase (443%) was in South Western Sydney LHD (101 cases, compared to 18.6 on average). The increased number of notifications occurred during the usual peak period in summer, particularly in February and March, and is partially explained by the increased use of a more sensitive test. In response, an enhanced surveillance of risk factors was undertaken, and a state-wide epidemiological analysis was circulated weekly. Recreational water exposures, especially public

swimming pools, were identified as a common risk factor, although no clusters were found. In addition to forwarding information to public pools about superchlorination and displaying prominent signage about personal hygiene, public health units (PHU) also followed up those pools which were epidemiologically linked to cases.

The number of **typhoid** infections were 44.6% higher than the five year quarterly average for this period; this increase was predominantly driven by cases in Western Sydney LHD (112% increase, n=14). All except one case was overseas acquired, predominantly amongst travellers to India. Locally-acquired cases usually relate to household transmission from someone who has recently travelled to a typhoid-endemic country. In addition to investigating the source of the infection, public health units actively follow up cases who are at higher risk of transmitting the infection due to their occupations (e.g. food handlers, healthcare workers or carers of young children or the elderly) or age (below school age).

There were 1,496 cases of **salmonellosis** reported in quarter 1 of 2017, above the five year quarterly average of 1372.6 cases (increase of 9%), but well below the number reported in the same period in the last two years. The largest increase (118%) was in Central Coast LHD (127 cases, compared to 58.2 on average), which was predominately related to a large foodborne investigation reported on page 5. The number of locally and overseas acquired *Salmonella* Enteritidis infections declined in quarter 1 of 2017 (Table 2). Detailed analysis of *Salmonella* notifications is described on page 7.

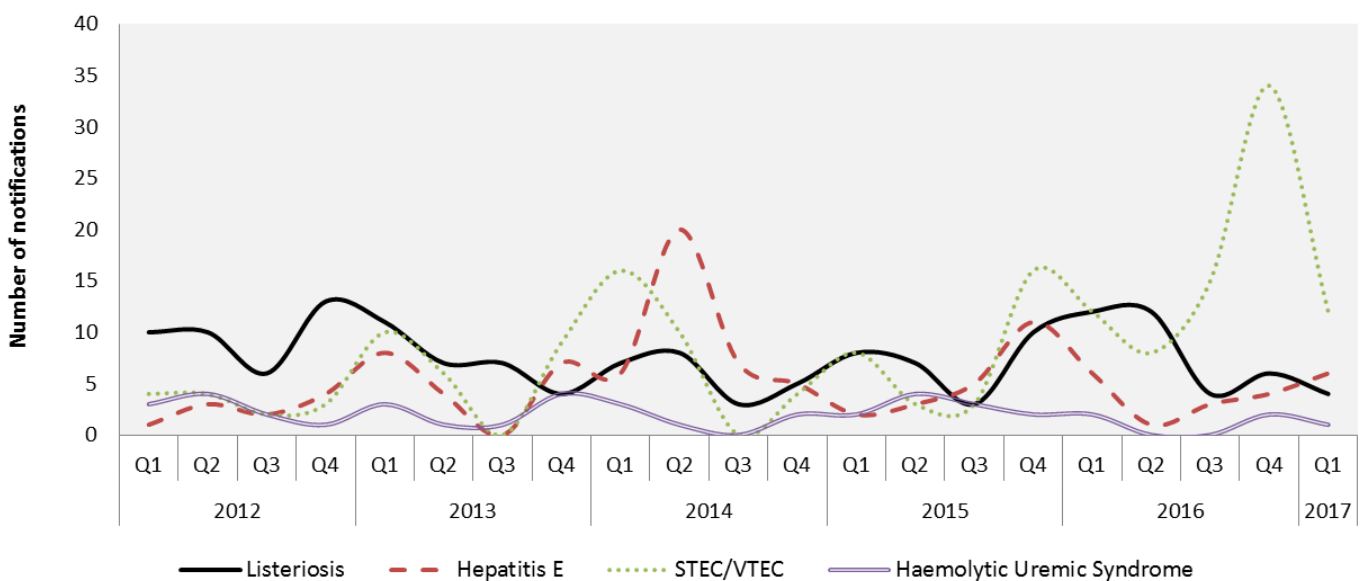
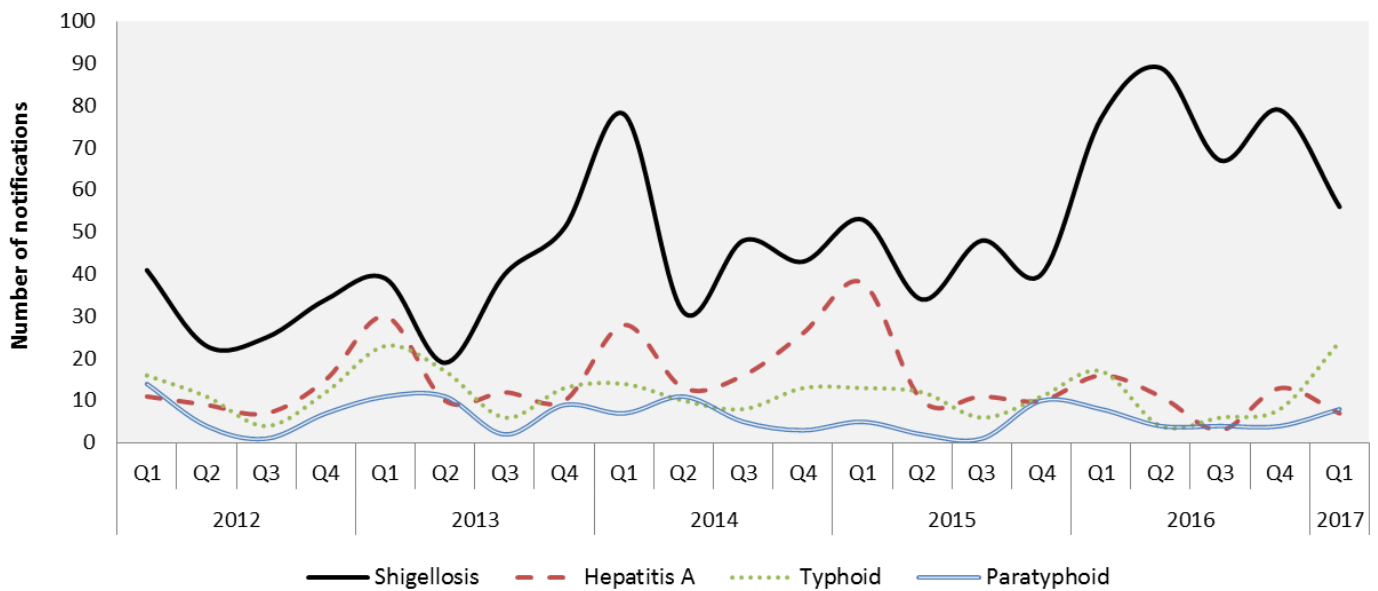
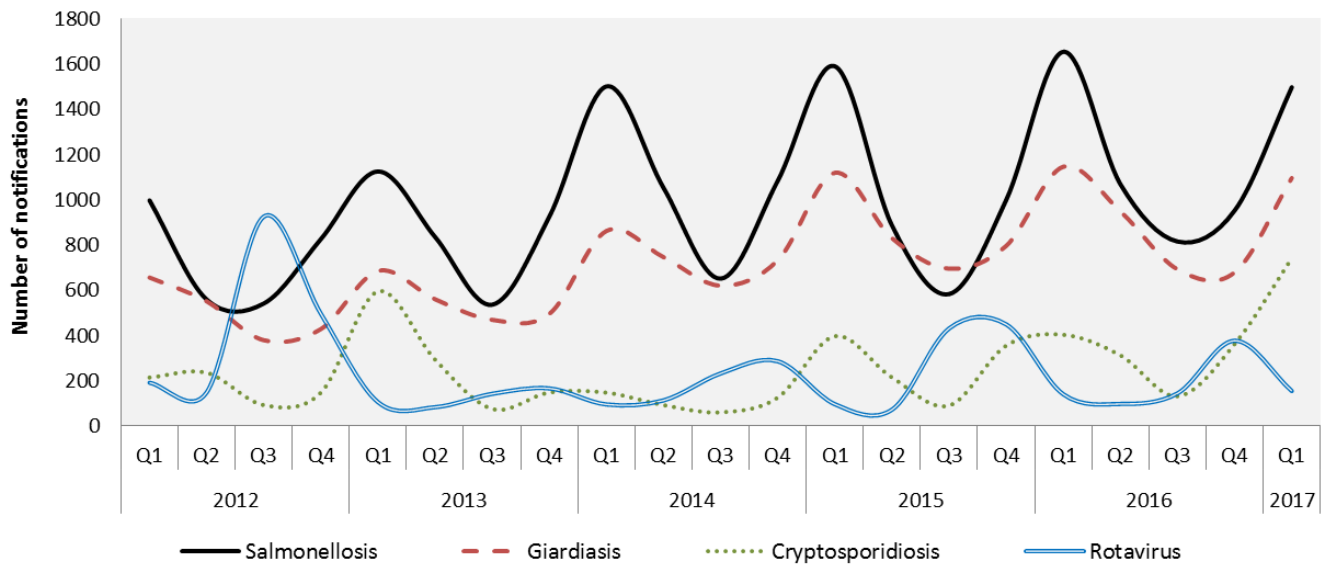
Fourteen **foodborne or suspected foodborne outbreaks** were reported affecting 90 people (Table 1), of whom eight were hospitalised (Table 4). For four outbreaks, a causative agent was linked to a contaminated food or drink source – *Salmonella* Typhimurium linked to egg products in two outbreaks, ciguatera fish poisoning linked to grouper fish in one outbreak, and *Salmonella* Wangata thought to be caused by consumption of

unboiled water in one outbreak. A pathogen was identified for four outbreaks but the food vehicle was unknown (*Salmonella* in three outbreaks, and *Campylobacter* in one outbreak). The remaining six outbreaks were of unknown aetiology.

Two other outbreaks were investigated as possible foodborne outbreaks but were found to be at least

in part due to person to person spread of a viral gastrointestinal pathogen (Table 4). 115 people were affected in these two outbreaks that involved two separate school camps. Norovirus was identified in one of these outbreaks, the other did not have any specimens collected but the epidemiology suggested it was also likely to be norovirus.

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



**Table 1. Notifiable enteric conditions, quarter 1 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, Q1 2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q1 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, Q1 2017	17	0	85	27	16	18	54	50	121	71	15	101	42	32	91	740
	5 y Q1 mean, 2012-2016	13.6	0.4	47.2	16.4	10.0	5.8	14.8	21.8	66.4	53.0	4.6	18.6	31.4	14.4	31.8	350.2
Giardiasis	Notified, Q1 2017	50	1	128	58	31	27	43	39	196	180	16	76	115	36	99	1095
	5 y Q1 mean, 2012-2016	35.8	2.4	118.6	53.6	24.0	18.6	40.2	22.0	161.0	154.0	18.8	51.6	82.2	34.8	75.0	892.6
Hepatitis A	Notified, Q1 2017	0	0	0	0	0	0	2	0	0	1	0	1	1	1	1	7
	5 y Q1 mean, 2012-2016	0.4	0.0	0.0	0.6	0.0	0.0	0.4	1.0	3.2	3.2	0.0	4.8	2.6	0.6	7.8	24.6
Hepatitis E	Notified, Q1 2017	0	0	1	0	0	0	0	0	0	2	0	0	1	0	2	6
	5 y Q1 mean, 2012-2016	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.2	0.8	0.0	0.2	0.4	0.0	1.8	4.6
Listeriosis	Notified, Q1 2017	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4
	5 y Q1 mean, 2012-2016	0.0	0.0	1.0	0.8	0.0	0.0	0.2	0.4	2.0	1.4	0.2	2.0	1.0	0.0	0.6	9.6
Rotavirus	Notified, Q1 2017	1	0	4	3	5	0	7	4	21	29	3	24	11	5	36	153
	5 y Q1 mean, 2012-2016	1.8	0.6	17.0	2.4	4.4	1.2	8.6	9.8	21.4	19.4	0.4	8.0	11.2	4.6	13.6	124.4
Salmonellosis	Notified, Q1 2017	127	10	155	85	61	63	54	143	177	152	42	140	110	36	141	1496
	5 y Q1 mean, 2012-2016	58.2	6.4	143.6	66.2	48.8	60.0	51.6	90.4	189.6	198.6	27.8	137.0	118.4	37.4	138.2	1372.6
Shigellosis	Notified, Q1 2017	3	0	3	1	0	0	3	3	7	15	0	3	8	1	9	56
	5 y Q1 mean, 2012-2016	2.4	0.0	1.0	1.0	1.0	0.6	1.6	2.6	6.0	19.4	0.4	2.2	13.2	0.4	5.8	57.6
STEC/VTEC	Notified, Q1 2017	0	0	2	1	4	0	0	0	0	0	2	0	1	0	2	12
	5 y Q1 mean, 2012-2016	0.2	0.0	2.8	1.0	0.4	0.0	0.4	0.6	0.2	1.4	0.8	0.8	0.8	0.2	0.2	10.0
HUS	Notified, Q1 2017	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	5 y Q1 mean, 2012-2016	0.0	0.0	0.8	0.2	0.0	0.0	0.4	0.2	0.2	0.0	0.0	0.6	0.2	0.0	0.0	2.6
Typhoid	Notified, Q1 2017	0	0	0	0	0	0	0	0	3	2	0	3	2	0	14	24
	5 y Q1 mean, 2012-2016	0.2	0.0	0.4	0.0	0.0	0.2	0.6	0.2	1.6	2.0	0.2	2.6	2.0	0.0	6.6	16.6
Foodborne* Outbreaks	Notified, Q1 2017	2	0	2	1	0	0	1	0	3	4	1	0	2	0	3	14 <sup>†</sup>
	People affected	18	0	12	4	0	0	1	0	12	21	1	0	6	0	12	87 <sup>#</sup>
Salmonella Cluster	Notified, Q1 2017	3	0	5	0	0	1	0	0	2	3	0	2	1	0	2	6 <sup>†</sup>
	People affected	45	0	7	0	0	1	0	0	8	8	0	9	2	0	3	83

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 <sup>#</sup>Not including 3 non-NSW residents <sup>†</sup>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 1 2017, by Local Health District

Notifiable Disease	Place infection acquired	NSW, Q1 2017	5 yr Q1 mean 2012-2016	2017 % change
Hepatitis A	Locally acquired	1	6.4	-84%
	Overseas acquired	6	17.8	-66%
	Unknown	0	0.4	-100%
Hepatitis E	Locally acquired	1	0.4	150%
	Overseas acquired	5	4	25%
	Unknown	0	0.2	-100%
<i>Salmonella</i> Enteritidis	Locally acquired	6	4.6	30%
	Overseas acquired	31	32	-3%
	Unknown	0	4.8	-100%
Paratyphoid	Locally acquired	0	0	0%
	Overseas acquired	8	8.8	-9%
	Unknown	0	0.2	-100%
Shigellosis	Locally acquired	24	27.4	-12%
	Overseas acquired	27	19.8	36%
	Unknown	4	10.4	-62%
STEC/VTEC	Locally acquired	10	5.4	85%
	Overseas acquired	2	0.4	400%
	Unknown	0	4.2	-100%
Typhoid	Locally acquired	1	0.6	67%
	Overseas acquired	22	15.8	39%
	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.

## Notable Foodborne Outbreaks

### ***Salmonella* Typhimurium 3-16-9-7-523 linked to an egg farm**

Between December 2016 and January 2017, 51 cases of *Salmonella* Typhimurium were linked to consumption of eggs from a single egg farm. Most of these cases were from Central Coast Local Health District, with eight cases from other NSW Local Health Districts.

A review of all NSW *Salmonella* Typhimurium specimens collected from 1 December 2016 to 20 January 2017 found a total of 42 confirmed and nine possible cases. Confirmed cases had the same MLVA 3-16-9-7-523. Of 41 cases interviewed, 17 people reported eating at a Central Coast café and 13 consumed meals containing egg or egg products at the café.

The NSW Food Authority and local council inspected the premises, and found that the café produced raw egg sauces. *Salmonella* Typhimurium MLVAs 3-16-9-7-523 and 3-17-9-11-523 were isolated from egg and environmental samples. These MLVAs were subsequently found by whole genome sequencing to be closely related to each other and to the human cases. A prohibition order was issued on the sale of raw egg sauces by the café. Subsequent reinspection of the venue did not identify any issues, and all samples were negative.

In collaboration with the local council, the NSW Food Authority assessed raw egg use in a selection of other food outlets in the area which used eggs from the same local supplier. One café was identified, which was linked to one case of *Salmonella* Typhimurium MLVA 3-16-9-7-523. A prohibition order was issued for the second café to cease production of raw egg sauces.

The NSW Food Authority inspected the local egg producer from which the cafés sourced their eggs. Environmental samples isolated *Salmonella*

Typhimurium. The NSW Food Authority is working closely with the egg producer to implement various practices on the farm to reduce the prevalence of *Salmonella* as part of the NSW *Salmonella* reduction strategy. The outbreak has been declared over, but enhanced surveillance remains in place for human infection with *Salmonella* Typhimurium MLVA 3-16-9-7-523 in the Central Coast area.

### ***Salmonella* Enteritidis associated with a cruise**

In early January 2017, a cluster of eleven cases of *Salmonella* Enteritidis was reported in people who had been passengers on a cruise ship which travelled from Sydney to New Zealand between 15 and 30 December 2016. Of the eleven cases, six were from NSW, three were from Queensland, and one each was reported from ACT and Western Australia.

Whole genome sequencing of three isolates indicated they were genetically identical, and belonged to a common clade which is typically overseas-acquired from South East Asia. This was the first cruise for the ship since arriving in Australia, having previously docked in Singapore, Vietnam and China.

Nine cases were interviewed and two restaurants on board the ship were identified as common exposures. No other common exposures, on vessel or land, were identified.

The NSW Food Authority and South Eastern Sydney Public Health Unit conducted a joint inspection of the cruise ship when it next docked in Sydney. No concerns relating to food handling practices were found. Food and environmental samples from the food preparation areas of the two implicated restaurants were negative. Investigations determined that some food products supplied on board the ship at the

probable time that passengers were infected, including eggs, were sourced from South East Asia.

Based on epidemiological and laboratory investigations, it is thought that the cluster was likely caused by consumption of contaminated food items supplied via a South East Asian port at one or more of the restaurants on board the ship, however a food source was not able to be identified.

### ***Salmonella* Wangata at a yoga retreat**

In February, a complaint was received by the NSW Food Authority regarding gastrointestinal illness associated with attendance at a yoga retreat.

Seventeen of the twenty attendees were interviewed or responded to an online questionnaire. Of these, eight (47%) reported gastrointestinal illness with onset on the last day of the retreat (n=1) or shortly after the retreat (n=7). Two stool specimens were positive for *Salmonella* Wangata.

Responses to the questionnaire suggested that consumption of unboiled tap water at the venue was associated with high risk of illness, but this was not statistically significant. Nevertheless, this is consistent with current research indicating that *Salmonella* Wangata is an environmental pathogen.

A joint inspection of the premises by the NSW Food Authority, local council and local public health unit found that the venue's source of drinking water was rainwater supplemented with spring water supplied by a water carter. The water carter was known to be delivering non-potable water. Water tanks at the premises were found to be adequately maintained although first flush devices were not present on all tanks and water was not routinely tested or treated. Water samples from the kitchen, bathroom and garden taps identified the presence of indicator bacteria, but *Salmonella* was not detected in any of the samples collected.

Based on epidemiological and environmental investigations, the consumption of unboiled water from the premises is thought to be the potential source for the outbreak but this cannot be confirmed. The venue was advised to use only bottled and/or boiled water for drinking purposes. The public health unit is working with the water carter to comply with an order to advise clients that the water supplied is non-potable.

### **Ciguatera fish poisoning**

In mid-February 2017, the NSW Food Authority received a complaint of food poisoning following a large banquet dinner at a restaurant. Four of 12 adults developed symptoms consistent with ciguatera poisoning 15 hours after consuming a 5kg grouper fish, which had been purchased from a live fish tank at the restaurant on 9 February 2017.

One case was interviewed. The case reported that all four who became ill had consumed the head and skin of the grouper and had required hospitalisation. Two of those ill were hospitalised overseas after travelling internationally after the meal.

Traceback of the grouper by the NSW Food Authority indicated that the fish had been bought on 20 January 2017 from a Queensland supplier who mainly fished in the warmer waters of northern Queensland (a high-risk ciguatera area). The NSW Food Authority inspected the venue, and no significant issues related to food production were found.

Testing of the leftover samples of the grouper did not reveal any ciguatera toxin, however no samples of the head of the fish were available for testing. Based on epidemiological investigations, it is thought that the cluster was likely caused by ciguatera poisoning due to consumption of the head of the grouper fish.



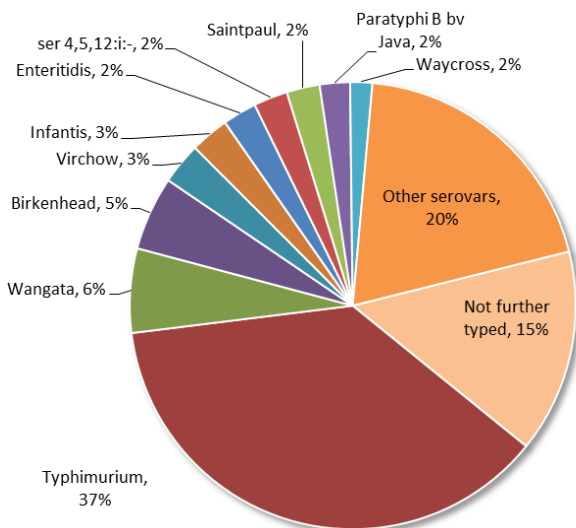
## Salmonella spotlight

Salmonellosis accounted for 41% of all enteric infections reported between 1 January and 31 March 2017. 1,496 notifications of *Salmonella* were received in this quarter, which is 9% above the five year quarterly average (n=1372.6). The top 12 *Salmonella* serotypes are shown in Figure 4.

The most common serovar was *Salmonella* Typhimurium at 37% (n=558) of the 1,498 notifications, which is 23% below the five year average of 721 *Salmonella* Typhimurium cases for this quarter. The most common *Salmonella* Typhimurium MLVA profile was 3-16-9-7-523, accounting for 7% of all *Salmonella* Typhimurium cases (Table 3), many of which were related to the outbreak linked to an egg farm identified on page 5.

Since 2011, there has been an overall decline in the number of *Salmonella* Typhimurium cases and an overall increase in *Salmonella* Enteritidis cases

**Figure 4.** Proportion of *Salmonella* serovars, quarter 1 2017 (N=1498)



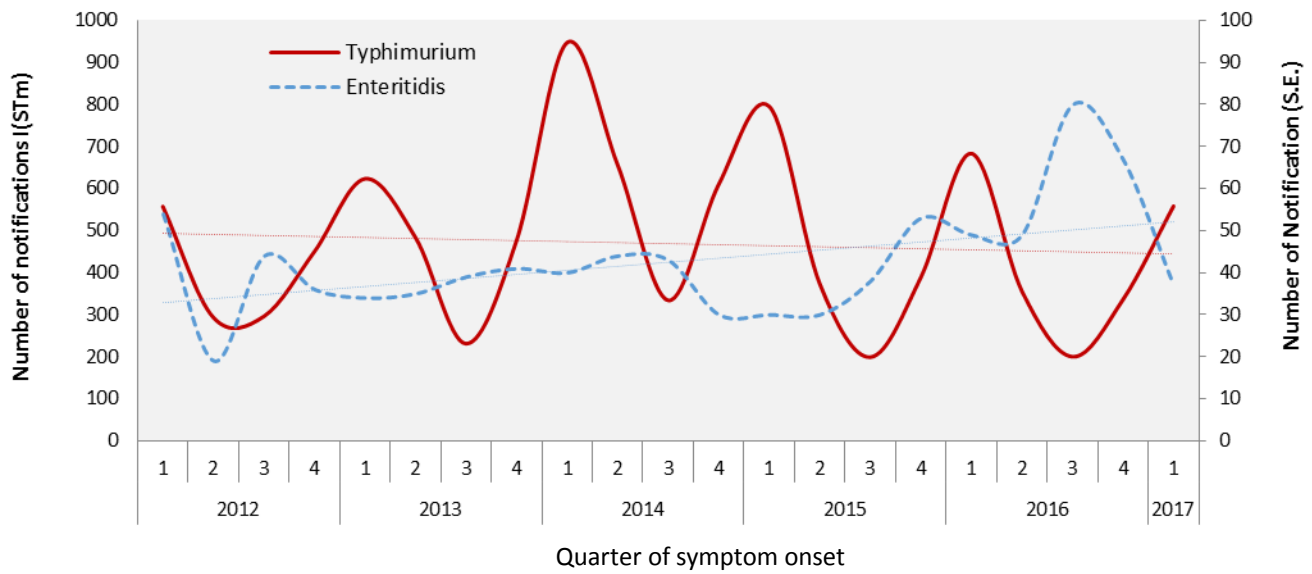
(Figure 5). However in this quarter, there was also a decrease in reported *Salmonella* Enteritidis cases (n=37, 11% below the 5 year average of 41 cases for this quarter).

*Salmonella* Wangata and *Salmonella* Birkenhead were the second and third most common serotypes in NSW, respectively. Both are suspected to be associated with environmental exposures, follow similar seasonal trends, and increased sharply in 2017 (Figure 6). In this quarter, there were 91 *Salmonella* Wangata and 80 *Salmonella* Birkenhead infections representing a 135% and 131% increase above the five year quarterly average respectively. Research exploring the particular risk factors for infection with these serotypes is ongoing.

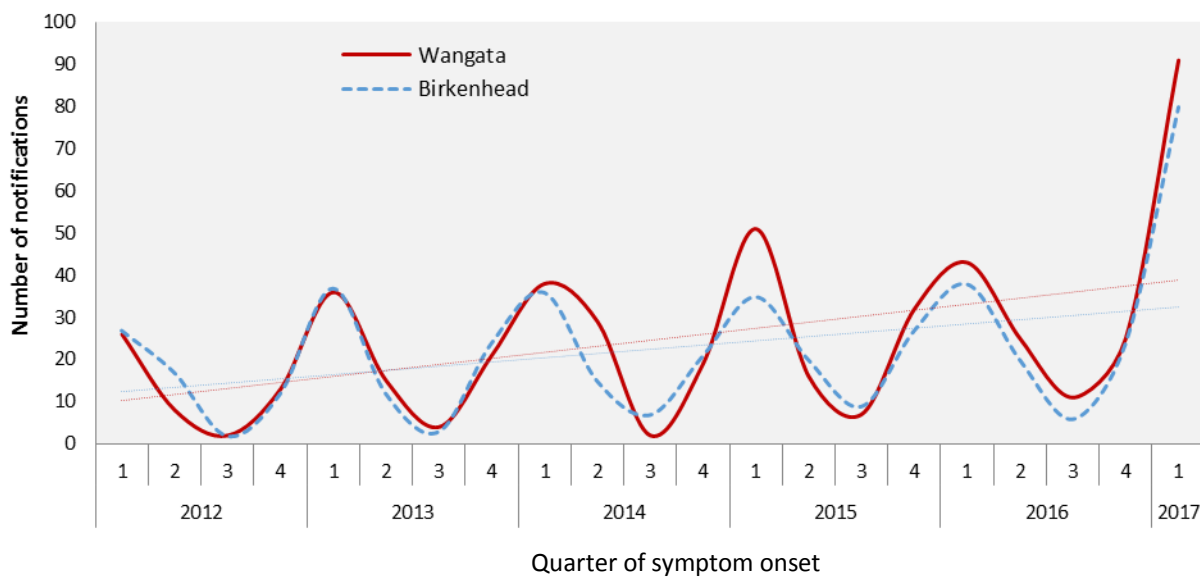
**Table 3.** Top 12 *Salmonella* Typhimurium MLVAs, quarter 1 2017

MLVA	Notifications	% of STm typed
3-16-9-7-523	34	7%
3-17-9-12-523	29	6%
3-17-9-11-523	23	4%
3-16-9-11-523	21	4%
3-12-13-9-523	19	4%
4-15-11-0-490	19	4%
3-12-12-10-523	15	3%
3-26-13-8-523	15	3%
3-9-7-12-523	14	3%
3-11-10-12-523	12	2%
3-12-12-9-523	12	2%
3-10-7-12-523	11	2%
<b>Top 12 total</b>	<b>224</b>	<b>43%</b>

**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.

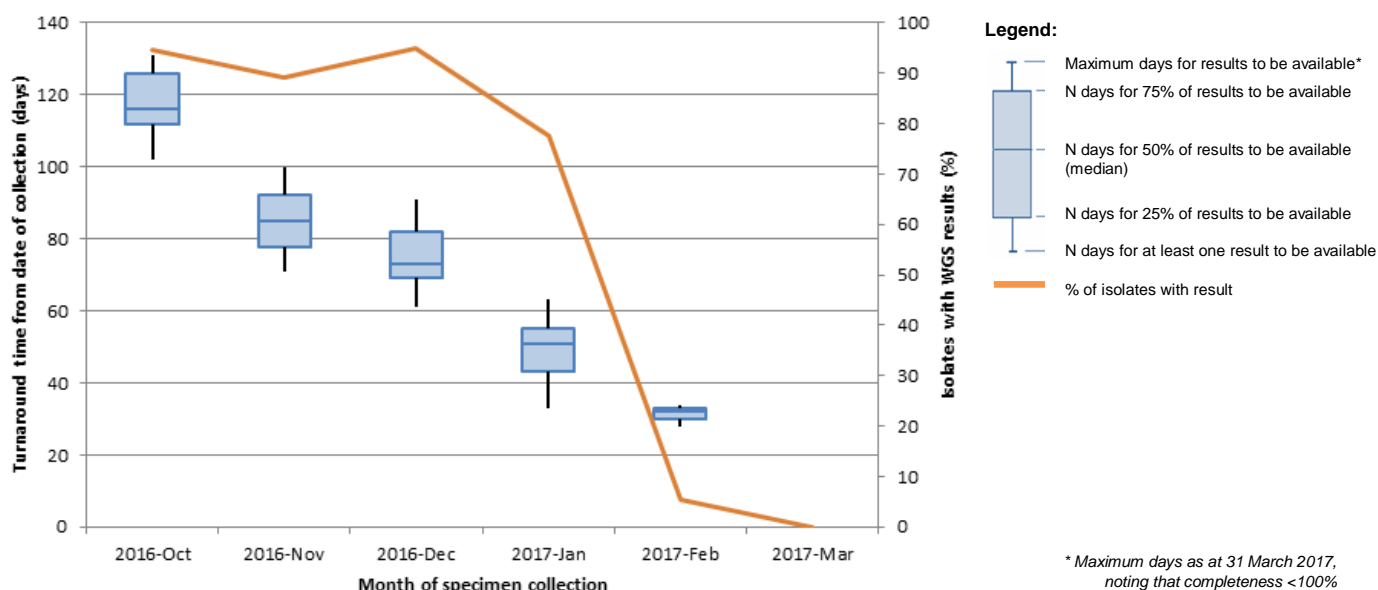
In quarter 1 2017, 922 specimens were submitted for whole genome sequencing, for which 538 results were available (58% of all *Salmonella* Typhimurium isolates submitted for sequencing). Of these, 63 clusters were detected, affecting 420 people (78%). The clusters ranged in size from 2 cases to 55, with a median cluster size of 3.

The largest cluster analysed was part of the *Salmonella* Typhimurium 3-16-9-7-523 outbreak linked to an egg farm, described in detail on page 5.

During this quarter, laboratory protocols to increase throughput and decrease turnaround time were developed. Cases which had been linked to outbreaks by epidemiological and MLVA evidence in quarter 4 2016 and quarter 1 2017 were retrospectively analysed by whole genome sequencing to assess correspondence of the technology with existing laboratory methods. All cases with strong epidemiological links were found to be associated.

Prospective WGS cluster investigation commenced in quarter 2 2017.

**Figure 7.** Trends in timeliness between specimen collection and reporting of whole genome sequencing results for *Salmonella* Typhimurium in NSW, October 2016 - March 2017, by month



**Table 4.** Foodborne and Suspected foodborne outbreaks, quarter 1 2017

PHU ID	Month <sup>#</sup>	Setting	Agent responsible	No. ill	Lab confirmed	No. Hospitalised	Evidence	Responsible vehicles	Contributing factors
CC201701	Jan	restaurant	<i>Salmonella</i> Typhimurium MLVA 3-16-9-7-523	17	17	0	M	Multiple - eggs and cross contamination	Cross contamination & use of raw egg
NSW201701	Jan	cruise	<i>Salmonella</i> Enteritidis	10	10	0	D	Unknown	Unknown
NSW201702	Jan	private residence	<i>Salmonella</i> Enteritidis	5	3	0	D	Unknown	Unknown
SES201701	Jan	picnic	<i>Salmonella</i> Typhimurium MLVA 3-17-9-12-523	9	2	2	D	French toast (with egg)	Undercooked eggs
SES53910	Feb	restaurant	Ciguatera fish poisoning	4	0	4	D	Grouper fish	Toxic fish
SES54155	Mar	restaurant	<i>Salmonella</i> Typhimurium MLVA 3-17-9-12-523	3	1	0	D	Unknown	Unknown
IS54600	Mar	restaurant	Unknown	4	0	0	D	Curries	Improper hot holding temperatures
NS201701	Jan	take-away	Unknown	5	0	0	D	Unknown	Unknown
NS201702	Feb	restaurant	Unknown	3	1	1	D	Unknown	Unknown
SES54568	Mar	restaurant	Unknown	5	0	0	D	Unknown	Unknown
SYD54561	Mar	restaurant	Unknown	3	0	0	D	Unknown	Unknown
WS54202	Feb	commercial caterer	<i>Salmonella</i> Wangata	10	2	1	A	Contaminated drinking water	Improper use of non-potable water
HUN0508	Feb	aged care	<i>Campylobacter</i>	6	2	0	D	Unknown	Unknown
HUN0509	Feb	restaurant	Unknown	6	0	0	D	Unknown	Unknown
Viral and suspected viral gastrointestinal outbreaks with likely person-to-person spread									
NS201703	Mar	camp	Norovirus	50	1	0	D	Unknown	Unknown
NS54344	Mar	camp	Unknown	65	0	0	D	Person to person	Unknown

<sup>#</sup>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 January to 31 March 2017, a total of 164 outbreaks of suspected viral gastrointestinal illness in institutions were reported in NSW affecting at least 2,076 people (Table 6). This represents an increase of 28% compared to the average number of outbreaks reported during the same quarter from 2012 to 2016 (n=128), and an increase of 16% compared to the mean number of people affected as a result of the gastroenteritis outbreaks (n=1,782).

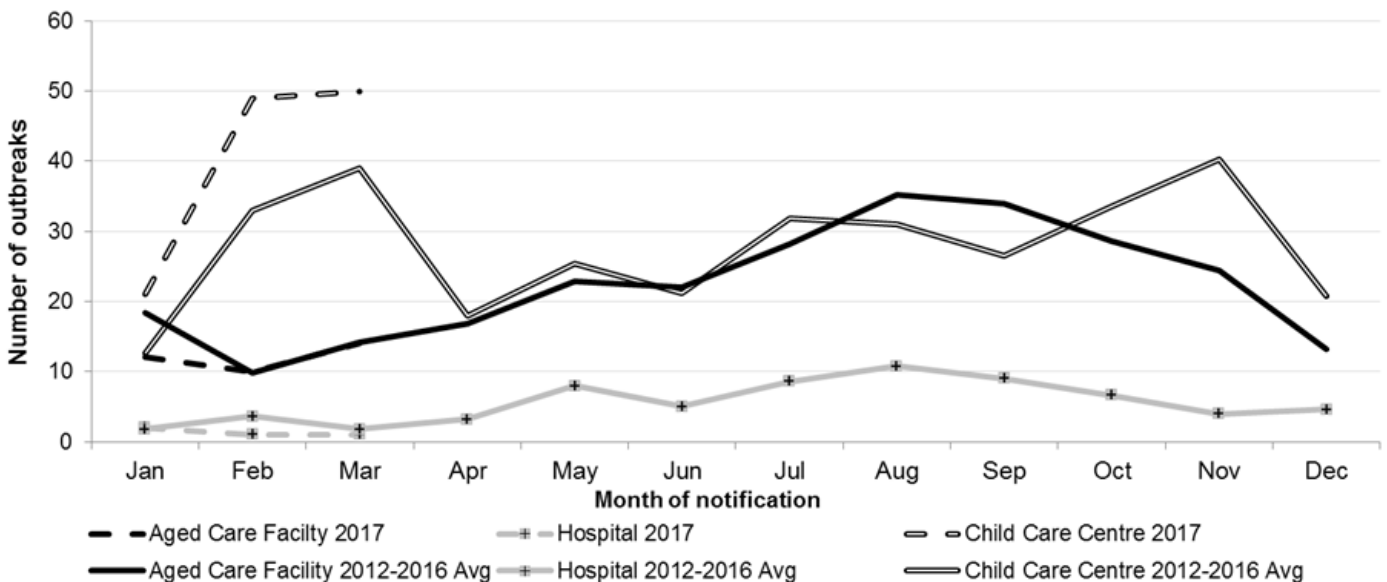
Of the 164 outbreaks, 120 (73%) occurred in child care centres, 36 (22%) in aged care facilities, four (2.5%) in hospitals and four (2.5%) in other facilities (Table 6). The number of child care centre outbreaks during quarter 1 was 41% higher than the five year quarterly average, but numbers of outbreaks in other facilities were within average levels (Figure 8).

Overall, 13% of staff members and 13% of non-staff became sick during gastroenteritis outbreaks (attack rate) in quarter 1 (Table 6). The highest attack rate for gastrointestinal disease for staff was in child care centres (17%) and for non-staff was in patients on hospital wards (25%). Outbreaks lasted nine days on average; shortest in hospitals (five days) and longest in child care centres (10 days) (Table 6).

One or more stool samples were collected in 52 (32%) of the outbreaks. Norovirus was identified in 14 (27%) of these outbreaks and rotavirus was identified in two (4%). 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 1 2017 compared to the 5 year quarterly average, by month and facility type



**Table 5.** Outbreaks of gastroenteritis in institutions reported in NSW, quarter 1 2017, by Local Health District\*

Facility type	Q1 2017	HNE	IS	M	MNC	NBM	NS	SES	SNSW	SWS	Syd	WNSW	WS	NSW
ACF	No. of outbreaks	10	3	2	1	1	4	3	0	5	5	0	2	36
	Staff affected	27	25	5	3	0	18	10	0	6	7	0	1	102
	Non-staff affectedd	93	50	11	15	6	71	95	0	29	40	0	35	445
CCC	No. of outbreaks	7	8	10	0	14	11	19	1	7	10	1	32	120
	Staff affected	19	22	19	0	24	24	48	5	11	28	3	107	310
	Non-staff affectedd	67	92	91	0	118	97	186	17	38	89	11	309	1115
Hospital	No. of outbreaks	0	0	0	0	1	0	1	0	1	1	0	0	4
	Staff affected	0	0	0	0	4	0	5	0	0	14	0	0	23
	Non-staff affectedd	0	0	0	0	0	0	4	0	3	13	0	0	20
Other	No. of outbreaks	0	0	2	0	1	0	0	0	1	0	0	0	4
	Staff affected	0	0	0	0	1	0	0	0	0	0	0	0	1
	Non-staff affectedd	0	0	35	0	14	0	0	0	11	0	0	0	60

\*CC, FW & NNSW 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 1 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	36	102: 3%	445: 16%	3	32: 89%	8: norovirus & 1: rotavirus
CCC	120	310: 17%	1115: 11%	10	17: 14%	4: norovirus & 1: rotavirus
Hospital	4	23: 7%	20: 25%	5	2: 50%	2: norovirus
Other	4	1: 0.5%	60: 16%	5	1: 25%	-
Total	164	436: 13%	1640: 13%	9	52: 32%	14: norovirus & 2: rotavirus

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