

OzFoodNet

Enhancing Foodborne Disease Surveillance Across Australia

NSW THIRD QUARTER REPORT

July – September 2019



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Highlights Quarter 3, 2019

This report describes data for enteric conditions for quarter 3, 2019. The report is divided into four sections: enteric notifiable diseases highlights, *Salmonella* spotlight, foodborne outbreaks and gastroenteritis outbreaks in institutions. Data sources and analytical methods are described at the end of the report. Every endeavour has been made to ensure that the information provided in this document is accurate at the time of writing. However, infectious disease notification data are continuously updated and subject to change.

A total of 4,382 enteric conditions were notified to NSW Public Health Units in quarter 3, 2019. When compared to the same quarter in previous years, moderate increases have been reported for Shigella, STEC, Typhoid and listeriosis.

Typhoid notifications increased above average quarterly levels (by 107%) in this period. Of the 17 notifications received during this quarter, three were classified as locally acquired. All three had no recent overseas travel or contact with returned travellers. One case worked in a pathology laboratory. For the remaining two cases they had at least one household contact who had travelled to Typhoid endemic countries within the previous 6 months and may have been asymptomatic carriers. All household contacts underwent clearance testing.

Notifications of **STEC** increased by 103% this quarter compared to the 5 year average. All cases except one were locally acquired. Locally acquired cases were mainly from non-metropolitan areas of NSW. Four notifications were able to be serotyped and seven were PCR only. Serotypes varied: O15:H7 (2 notifications), O111:H- (1 notification) and O128 (1 notification). One case also was notified with **HUS**. Exposures varied amongst cases including, exposure to uncooked red meat, raw fruit and vegetables, farm animals and drinking untreated tank water.

Notifications of **shigellosis** continue to remain above average, primarily as a result of a change in the national surveillance case definition on 1 July 2018 (see page 7 for detail). However, 53 cases met the confirmed case definition, which was a 8% decrease compared to the 5 year quarterly average. During this quarter 14 (26%) confirmed cases were identified as Multi Drug Resistant (MDR).

Listeriosis notifications were 79% above average quarterly levels this period, however notifications remained low overall (5 cases). One case was linked to a cluster reported in the previous quarter where smoked salmon was the likely source. Two cases were a mother and baby pair with the infection resulting in an emergency caesarean section from which the baby survived. The source of the listeria is unknown, though the mother

reported consuming a number of high-risk foods (raw fruits, vegetables, bocconcini and sushi).

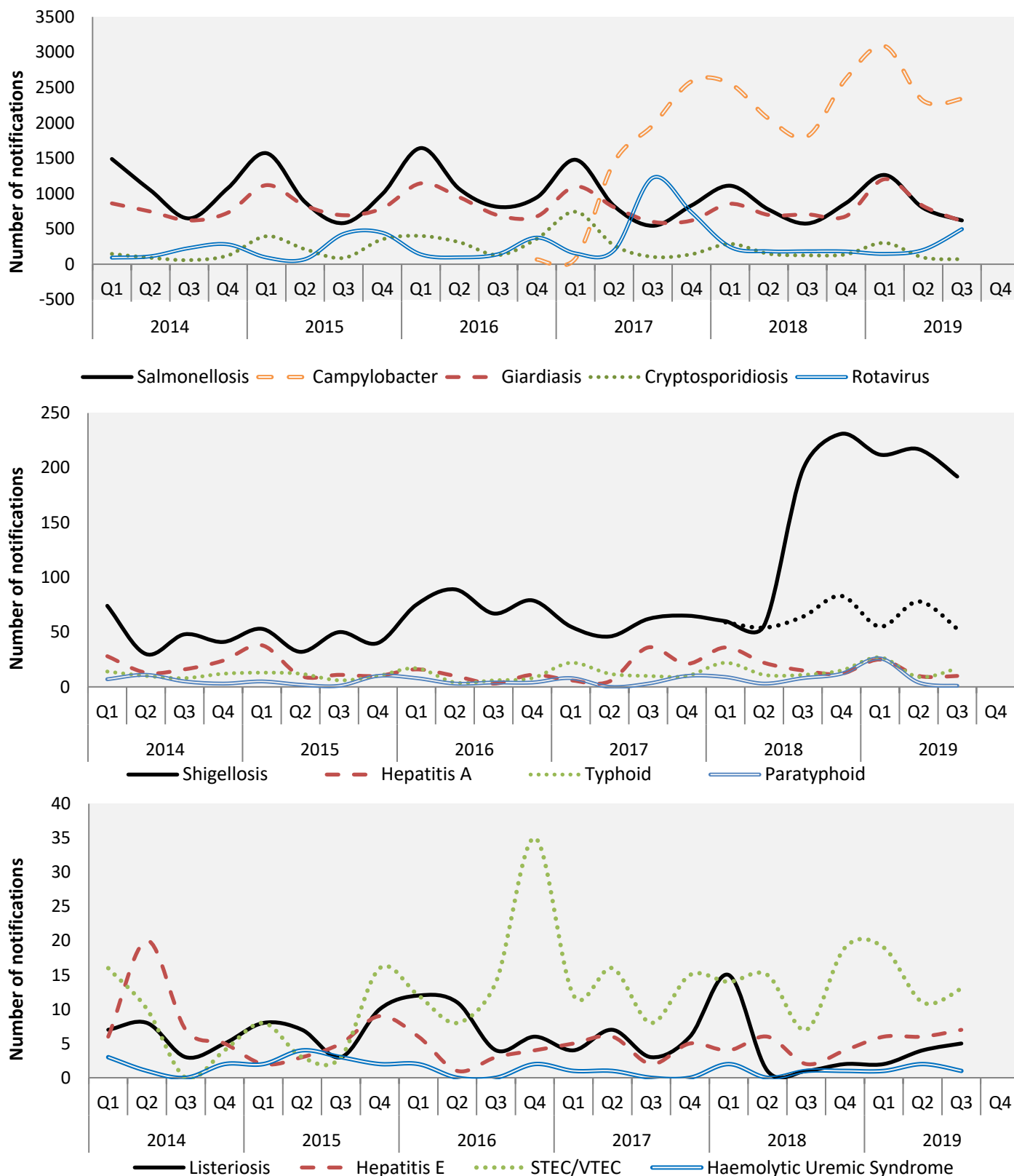
Salmonellosis notifications decreased slightly in quarter 3, 2019 (down 2%) compared to the five-year quarterly average for the same period. *Salmonella* Typhimurium was the highest notified *Salmonella* serotype this quarter, however notifications continued to decline (n=118, down 39% compared to the 5 year quarterly average of 193 cases). *Salmonella* Enteritidis was the second highest notified *Salmonella* serotype in quarter 3, 2019 (n=70). While locally acquired cases remained constant, overseas acquired cases increase by 34% above average.

Moderate decreases were noted in cryptosporidiosis, giardiasis, hepatitis A and paratyphoid fever. No notifications of cholera or botulism were received. Long term trends are not available for campylobacteriosis, which became notifiable on 7 April 2017, however notifications received in this quarter were slightly below the same quarter in the previous year. The long term trends for 13 notifiable enteric conditions in NSW are shown in Figures 1-3.

Eleven **foodborne or suspected foodborne outbreaks** were reported affecting at least 148 residents of NSW (Table 1), of whom at least 6 were hospitalised (Table 6). A causative agent was linked to a food source in seven outbreaks: Ciguatera poisoning linked to consumption of red-throat emperor fish in one outbreak; *Salmonella* Typhimurium linked to eggs in two outbreaks and raw chicken in one outbreak. *Listeria monocytogenes* linked to smoked salmon in one outbreak and Hepatitis A possible linked to imported food in another outbreak. The five remaining outbreaks were of unknown aetiology and cause.

Highlights continued

Figures 1-3. Number of notifications by year, quarter and disease, July 2014 to September 2019^{1,2}



¹ Campylobacteriosis became notifiable on 7 April 2017. Data is likely to be incomplete for this quarterly report due to the methods of notification from laboratories.

² The shigellosis case definition changed on 1 July 2018 to include probable cases (PCR positive only). The trend number of confirmed cases only, which is more comparable to previous counts of shigellosis prior to the case definition change, is provided by the black dotted line.

Table 1. Notifiable enteric conditions, quarter 3 2019, by local health district

Notifiable Disease		CC	FW	HNE	IS	M	MNC	NBM	NNSW	NS	SES	SNSW	SWS	SYD	WNSW	WS	NSW ¹
Botulism	Notified, Q3 2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q3 mean, 2014-2018	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
Campylobacteriosis ^{2,3}	Notified, Q3 2019	118	7	187	136	117	49	75	112	434	346	73	147	189	89	261	2340
	5 y Q3 mean, 2014-2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cholera	Notified, Q3 2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q3 mean, 2014-2018	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 2019	1	0	4	2	3	4	2	5	15	13	0	4	5	6	7	71
	5 y Q3 mean, 2014-2018	4.2	0.0	11.2	7.2	4.6	3.4	2.6	6.0	17.2	15.0	2.0	5.2	8.4	5.2	9.2	101.4
Giardiasis ³	Notified, Q3 2019	38	0	70	38	38	16	28	52	74	84	1	52	42	20	56	609
	5 y Q3 mean, 2014-2018	28.4	1.8	78.4	39.8	26.6	15.0	27.8	32.8	105.4	117.0	9.2	38.6	63.0	25.6	51.8	661.2
Hepatitis A	Notified, Q3 2019	0	0	0	0	0	0	0	0	3	2	0	0	1	0	4	10
	5 y Q3 mean, 2014-2018	0.4	0.0	1.6	0.6	0.0	0.2	0.6	0.4	1.4	3.2	0.0	1.8	3.6	0.0	2.4	16.2
Hepatitis E	Notified, Q3 2019	0	0	0	1	0	0	0	0	0	0	0	2	1	0	3	7
	5 y Q3 mean, 2014-2018	0.0	0.0	0.2	0.0	0.2	0.0	0.2	0.0	0.2	0.2	0.0	1.0	0.8	0.0	1.0	3.8
Listeriosis	Notified, Q3 2019	3	0	1	0	0	0	0	0	0	0	0	1	0	0	0	5
	5 y Q3 mean, 2014-2018	0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.6	0.0	0.2	0.8	0.4	0.0	0.2	2.8
Paratyphoid	Notified, Q3 2019	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	5 y Q3 mean, 2014-2018	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.6	1.0	0.0	0.6	0.8	0.0	1.0	4.2
Rotavirus	Notified, Q3 2019	8	3	34	19	4	5	29	29	74	77	4	77	48	23	62	496
	5 y Q3 mean, 2014-2018	15.2	1.6	35.2	9.4	9.0	2.2	18.6	25.0	63.6	78.4	4.6	55.4	36.6	21.2	65.6	441.6
Salmonellosis	Notified, Q3 2019	26	3	63	28	32	21	31	35	76	80	10	80	45	20	70	620
	5 y Q3 mean, 2014-2018	21.0	2.2	69.8	27.0	22.6	18.6	27.2	33.8	100.8	84.8	14.8	73.0	53.6	15.0	66.8	631.0
Shigellosis ⁴	Notified, Q3 2019	6	0	14	7	6	2	6	12	35	41	2	14	24	2	21	192
	5 y Q3 mean, 2014-2018	4.2	0.0	4.2	2.6	0.2	0.8	1.6	3.6	11.6	21.4	1.8	7.2	18.6	0.4	6.8	85.0
STEC	Notified, Q3 2019	0	0	0	0	3	0	1	0	0	1	2	1	0	4	1	13
	5 y Q3 mean, 2014-2018	0.2	0.4	0.2	0.0	1.0	0.0	0.0	0.0	0.0	0.6	1.2	0.4	0.0	0.4	2.0	6.4
HUS	Notified, Q3 2019	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
	5 y Q3 mean, 2014-2018	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.8
Typhoid	Notified, Q3 2019	0	0	2	0	0	0	1	0	1	1	1	5	1	0	5	17
	5 y Q3 mean, 2014-2018	0.0	0.0	0.4	0.4	0.2	0.4	0.0	0.2	0.6	1.6	0.0	0.8	1.4	0.2	2.0	8.2
Foodborne ⁵ Outbreaks	Notified, Q3 2019	2	1	2	1	0	0	1	0	0	2	1	2	2	2	2	11
	People affected	3	1	6	15	0	0	2	0	0	10	74	18	9	5	5	148
Salmonella Cluster	Notified, Q3 2019	2	1	4	0	0	1	2	0	1	3	2	1	1	1	3	22
	People affected	2	1	7	0	0	1	3	0	2	4	4	1	1	2	5	33

Legend: Blue shading refers to a 100% or greater increase in the number of notifications compared to the five year quarterly average. Notes: ¹ Total NSW numbers may differ to the sum of cases by LHD due to some cases not being attributed to an LHD; ² Campylobacteriosis became notifiable on 7 April 2017, 5 year quarterly average data not available (NA); ³ Data is likely to be incomplete for this quarterly report due to changes in the methods of notification from laboratories; ⁴ Case definition changed on 1 July 2018 to include 'probable' cases; ⁵ Foodborne or potentially foodborne outbreaks.

Table 2. Notifiable enteric conditions, quarter 3 2019, by overseas or local acquisition

Notifiable Disease	Place infection acquired	NSW, Q3 2019	5 yr Q3 mean 2014-2018	2019 % change
<i>Salmonella</i> Enteritidis	Locally acquired	9	9.0	0%
	Overseas acquired	60	44.8	34%
	Unknown	1	3.4	-71%
Hepatitis A	Locally acquired	4	6.6	-39%
	Overseas acquired	6	9.2	-35%
	Unknown	0	0.4	-100%
Hepatitis E	Locally acquired	3	2.0	50%
	Overseas acquired	4	1.4	186%
	Unknown	0	0.4	-100%
Paratyphoid	Locally acquired	0	-	0%
	Overseas acquired	1	4.2	-76%
	Unknown	0	-	0%
STEC	Locally acquired	12	4.6	161%
	Overseas acquired	1	0.4	150%
	Unknown	0	1.4	-100%
Shigellosis ¹	Locally acquired	42	27.4	53%
	Overseas acquired	120	32.2	273%
	Unknown	30	25.4	18%
Typhoid	Locally acquired	3	0.2	1400%
	Overseas acquired	14	7.8	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.

¹ The Shigellosis case definition changed on 1 July 2018 to include probable cases (PCR positive only). As per the [NSW Shigellosis Control Guidelines for Public Health Units](#), place of infection is only investigated for probable shigellosis cases if (a) they meet criteria for considered to be at greater risk of ongoing transmission, or (b) they subsequently become a confirmed case.

Salmonella Spotlight

In quarter 3 2019, 14% of notified enteric infections were salmonellosis. The number of salmonellosis notifications was 2% lower in this quarter, compared to the 5 year quarterly average. Of the 620 *Salmonella* notifications, 19% were *S. Typhimurium* (118 cases). This is a 39% reduction in *S. Typhimurium* notifications compared to the five year average for this quarter (193 cases). Since 2011, there has been an overall decline in the number of *S. Typhimurium* notifications (Figure 5). This can in part be attributed to the NSW Food Safety Strategy 2015-2021, which aims to reduce *Salmonella* notifications by 30% through improved food safety practices, verification programs, and training across the retail sector.

S. Enteritidis notifications accounted for 11% (70 cases) of all *Salmonella* notifications in quarter 3, 2019. The majority of notifications were overseas acquired with nine reported as locally acquired. Five locally acquired cases were linked to an outbreak in NSW which commenced in May 2018 and led to the recall of eggs from multiple egg producers. Details of the investigation can be found in previous reports. Two cases were not linked to any other NSW cases by WGS, one was linked to cases on an interstate cruise on a ship that travelled through Asia and the other was a sequence that is common to Indonesia.

S. Virchow, *Paratyphi B bv Java* and *S. ser 4,5,12:i-* were the highest notified serovars following *S. Typhimurium* and *S. Enteritidis* in quarter 3, 2019 (Figure 4). Figure 5 shows the trends by quarter for the top 4 serovars. No clustering among cases were noted during this quarter.

Figure 4. Proportion of *Salmonella* serovars, quarter 3, 2019 (N=620)

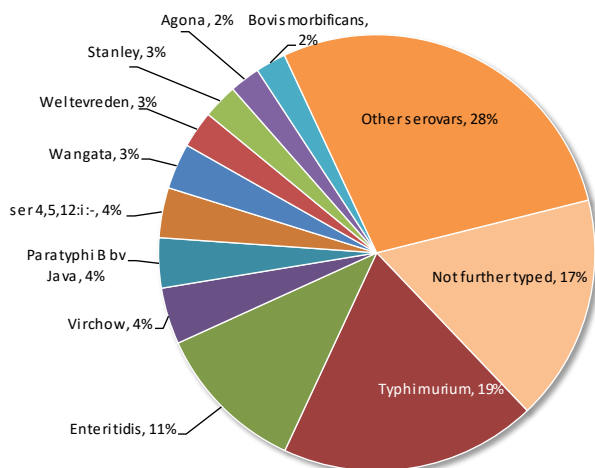
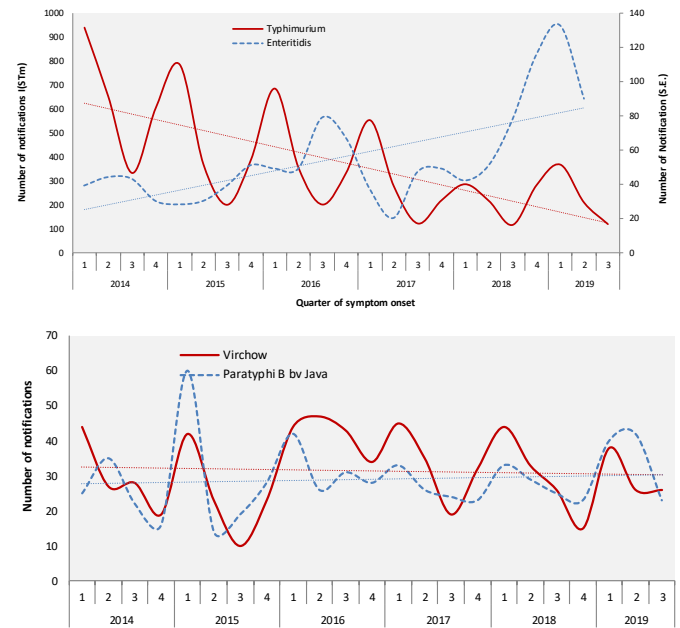


Figure 5. Trends, by quarters, for key *Salmonella* serovars in NSW from 2014-2019



Molecular Typing

As at 1 July 2019, all *Salmonella* Typhimurium isolates are whole genome sequenced, MLVA is no longer conducted in NSW. During quarter 3, 76 (64%) cases clustered with at least one other case. Nineteen cases were the first case identified in a cluster.

Table 3: Top 6 *Salmonella* Typhimurium WGS clusters, quarter 3, 2019 (N=76)

Cluster ID	Cases linked in Q3	Total cases in cluster to date	First onset date	Source
STM-19-0027	8	9	14/09/2019	Raw egg use at private party
STM-19-0008	9	12	26/06/2019	Raw chicken
STM-19-0011	6	6	19/7/2019	Travel to vanuatu
STM-19-0017	3	3	21/07/2019	Raw Chicken
STM-19-0009	3	3	3/07/2019	Unknown
STM-16-0021	3	17	16/10/2016	Unknown

Shigella Spotlight

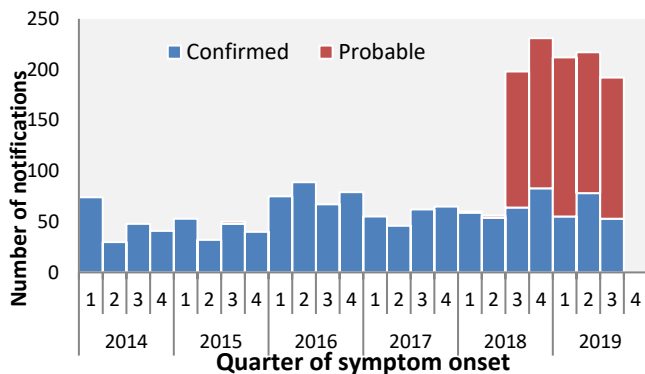
The national Shigellosis case definition changed on 1 July 2018 to include 'probable cases.' Probable cases include those with a detection of *Shigella* on nucleic acid testing only (PCR). The ipaH gene used as the target for all current nucleic acid tests for *Shigella* is common to both *Shigella* species and enteroinvasive *Escherichia coli* (EIEC). Thus, we are unable to differentiate between Shigellosis cases and EIEC cases in probable *Shigella* notifications.

This section describes Shigellosis notifications in NSW by classification (confirmed, probable) to allow comparison with previous years. The number of Shigellosis notifications, by classification, is shown for each quarter in Figure 6.

In quarter 3, 2019, 53 confirmed cases of Shigellosis were notified in NSW. This is an 8% decrease compared to the five year average of confirmed Shigellosis notifications for this quarter (57 cases). In quarter 3, 2019, 139 probable cases of Shigellosis were notified in NSW.

The proportion of infections acquired overseas varied among confirmed and probable Shigellosis cases in quarter 3, 2019 (40% and 67% respectively) (Table 4). However, the primary country of acquisition was different between confirmed cases and probable cases (India, and Indonesia, respectively) (Table 5).

Figure 6. Number of Shigellosis notifications by year, quarter and classification, Jan 2014 to Sept 2019



Additional risk factors identified by confirmed cases include sexual activity with faecal exposure during their incubation (30%) and contact with a confirmed or suspected case (8%). Probable case data is incomplete for these risk factors as cases are not interviewed, information is obtained from the treating doctor (Table 4).

Table 4. Shigellosis cases notified in quarter 3, 2019, by exposure and classification

Exposures	Confirmed cases		Probable cases	
	No	%	No	%
Overseas acquired	27	40%	93	67%
Sexual activity with faecal exposure during incubation period	16	30%	5	4%
Contact with confirmed or suspected case	4	8%	3	2%

Table 5. Top 5 countries of acquisition, Shigellosis cases notified in quarter 3, 2019, by classification

Country	Confirmed cases	
	No	% overseas acquired
India	8	30%
Indonesia	3	11%
Lebanon	2	7%
Germany	2	7%

Country	Probable Cases	
	No	% overseas acquired
Indonesia	15	16%
India	12	13%
Morocco	7	8%
Pakistan	2	2%
Fiji	2	2%

Foodborne and suspected foodborne outbreaks

NSW Health investigates all potential foodborne disease outbreaks. 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. The most notable outbreaks are described on pages 9-10.

Table 6. Foodborne and potentially foodborne disease outbreaks investigated in NSW, quarter 3 2019

PHU ID	Month ¹	Setting	Agent responsible	No. ill	Lab confirmed	No. Hospitalised	Evidence	Responsible vehicles	Contributing factors
WNSW63653	July	Restaurant	<i>Salmonella</i> Typhimurium (STM-19-0004)	3	3	0	D	Raw egg aioli	Insufficient acidification
WS63558	July	Private residence	Ciguatera	5	0	0	D	Red-throat emperor fish	Toxic substance or part of tissue
MJOI201903	July	Community	Listeria monocytogenes	2 [^]	2	2	A, M, D	Smoked salmon	Unknown
IS63586	July	Restaurant	Unknown	15	0	0	A, D	Garden salad	Unknown
SES63681	July	Restaurant	Unknown	9	0	0	D	Unknown	Unknown
NSW201902	July	Community	Hepatitis A – locally acquired	4	4	4	A, D	Imported products/ Unknown	Unknown
SNSW201901	August	Camp	Unknown	74	0	0	D	Unknown	Unknown
NSW201903	August	Community	<i>Salmonella</i> Typhimurium WGS ID STM-19-0008 (MLVA 3-13-16/17-9-523)	10 ^{^^}	10	Unknown	M	Raw chicken	Unknown
SYD63972	August	Restaurant	Unknown	8	0	0	D	Unknown	Inadequate or failed disinfection
HNE201902	September	Takeaway	Salmonella	4	1	0	D	Unknown	Unknown
SWS201903	September	Private residence	<i>Salmonella</i> Typhimurium	17	7	Unknown	D	Raw egg frosting	Insufficient cooking

¹ Month of outbreak is the month of onset of first case or month of notification/investigation of the outbreak.

[^]Outbreak MJOI201903 affected four people nationally, of which two were residents of NSW (see page 9).

^{^^}Outbreak NSW201903 affected 15 people nationally, of which 10 were residents of NSW (see page 10).

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.

Notable Foodborne Outbreaks

Key points

- People vulnerable to listeriosis are recommended to avoid smoked salmon, along with [other foods likely to be contaminated with *Listeria* bacteria](#).
- Raw egg use in ready to eat products such as deserts and dressings are a common cause of salmonellosis and can be avoid by using commercially produced products.

Multi-state outbreak of *Listeria Monocytogenes* MLST 120 associated with smoked salmon – MJOI 201903

In July 2019 two cases of *Listeria Monocytogenes* MLST 120 in residents of NSW were linked to a national multijurisdictional outbreak investigation as a result of WGS and phylogenetic analysis.

The NSW cases had onset dates in May and July 2019. Both cases had pre-existing health conditions. One case died as a result of the illness. Food consumption histories were obtained for both cases, with both reporting consumption of high-risk foods including smoked salmon during their respective exposure periods.

Epidemiological and laboratory investigations during the multi-jurisdictional outbreak investigation identified smoked salmon arising from an interstate supplier as the likely cause of the outbreak. Food agencies worked with that business to ensure the food produced was as safe as possible.

Smoked salmon is considered a high-risk food for listeriosis. People vulnerable to listeriosis infection should not eat smoked salmon, pre-cut fruit, soft cheeses or other foods likely to be contaminated with the *Listeria* bacteria. For further information, see the [listeriosis fact sheet](#).

Ciguatera poisoning associated with red-throat emperor fish - WS63558

Two instances of suspected ciguatera fish poisoning were reported in people who had consumed red-throat emperor fish during quarter 3 2019.

In the first instance, a family of three people from metropolitan Sydney became unwell after consuming the fish on 5 July 2019. Symptom onset occurred within three hours, including the sensation of temperature reversal, perioral tingling and nausea. A sample of the fish meal

consumed by the family was submitted for analysis and no toxin was detected (it should be noted this was not unexpected, as the testing can only detect one of the ciguatoxin types).

In the second instance, a family of two people from regional NSW became unwell after consuming fillets from a 2-2.5 kg fish on 6 July 2019. The fish was filleted at the place of purchase. Symptom onset occurred within a few hours, resulting in diarrhoea, headache, muscle weakness and, for one person, temperature reversal. The remaining product was withdrawn from retail sale and the supplier conducted a trade level recall on 9 July 2019.

A NSW Food Authority investigation was conducted, involving tracing supply of the implicated fish and review of ciguatoxin risk control measures. Those control measures at the time included restrictions on the sale of high risk fish and fish caught in high risk areas.

Ciguatera poisoning can be avoided by not eating large warm water (reef) fish. The head, roe, liver and other viscera of warm water ocean fish should not be eaten, as ciguatera toxin can be concentrated in these parts of the fish. There are certain reefs in waters off the Northern Territory and Queensland which are known to be associated with ciguatera poisoning. Fish of any size caught at these reefs should not be eaten. For further information, see the NSW Health [seafood poisoning fact sheet](#) and the NSW Food Authority [Fish ciguatera poisoning fact sheet](#).

Outbreak of *Salmonella* Typhimurium linked to raw egg aioli - WNSW63653

A geographical clustering of *Salmonella* cases within a rural NSW town was investigated in July 2019. Three people, from three different dining groups, were identified as developing gastrointestinal illness after dining at a restaurant in in the town between 20 and 22 June 2019 (one case dined at the venue twice). The median age of cases was 59 years (range 27-66 years), and 66% were female. Onset of symptoms ranged from 24-48 hours after dining at the venue, and one case presented to the local hospital. All three cases were culture positive for *Salmonella* Typhimurium, and WGS confirmed all three were phylogenetically linked (STM-19-0004). Two cases reported consuming a fish dish at the venue, and the third case reported consuming fries with aioli. NSW Food Authority was informed, and the local council inspected the

venue. The business confirmed they had been serving a raw egg based aioli on a number of dishes. A sample of aioli made by the venue was collected (although not the implicated batch). No *Salmonella* was detected in the sample, however the pH was high (5.13) and would have allowed for survival of *Salmonella*. NSW Food Authority [Food Safety Guidelines for the Preparation of Raw Egg Products](#) recommend that foods containing raw eggs must be acidified to a pH of 4.2 (or less) to reduce the risk of causing salmonellosis. Safer alternatives include commercially produced dressings and sauces, or pasteurised egg products. The business was issued with a prohibition order preventing the sale of raw egg mayonnaise and aioli.

Outbreak of *Salmonella* Typhimurium linked to raw egg frosting - SWS201903

A cluster of *Salmonella* cases linked to a primary school in a metropolitan Sydney was identified in September 2019. Students at a local primary school, shared a homemade birthday cake at the school on 13 September 2019. Approximately 35 people ate the cake at the school. The class teacher reported approximately 15 students were ill and away from school the following week. The class teacher, and five students were tested and were found to be positive for *Salmonella*. The cake had a frosting made with raw eggs sourced from backyard chickens. Six of the seven *Salmonella* cases were culture positive for *Salmonella* Typhimurium and WGS confirmed all were phylogenetically linked. The remaining case was *Salmonella* PCR positive (not submitted for culture). Education regarding *Salmonella* and raw egg use was provided.

Outbreak of *Salmonella* Typhimurium (MLVA 3-13-16/17-9-523) linked to raw chicken - NSW201903

In August 2019, NSW Health identified a cluster of *Salmonella* Typhimurium through WGS (STM-19-0008). As MLVA had only been recently ceased in NSW, some isolates underwent MLVA to allow comparison with recent historical isolates. All had the profile 3-13-17-9-523. This profile matched four food isolates collected by the NSW Food Authority in May/June 2019 collected through routine sampling of raw chicken at retail stores.

Subsequently 15 cases were linked via WGS nationally and six chicken isolates. A further 8 cases were potential linked via MLVA profile 3-13-17-9-523. The raw chicken samples were traced back to a processing facility, which underwent a review of food safety practices.

This outbreak highlighted both the importance of correct handling and cooking of raw products, including raw chicken, and the value of establishing a surveillance system with both human and food/environmental isolates. It is difficult for members of the public to recall what type of raw chicken (breast fillets, drumsticks) and brands they purchased before becoming ill. Molecular typing of food isolates helped provide this valuable pieces of information.

Cluster of Hepatitis A with links to South Korea - NSW201902

A genetic cluster of locally acquired Hepatitis A (HAV) cases were identified between July and August 2019, amid a rise in other cases imported from South Korea. There were a total of four cases in the cluster, three in quarter 3 and another reported in quarter 4. All cases were South Korean born residents of NSW. Cases had no recent travel except one who spent approximately 20% of incubation period in South Korea. All cases reporting buying their groceries from Korean grocery stores.

Phylogenetic analysis indicated the sequences seen in these cases matches a sequence seen in previous travellers to South Korea. At the time South Korea was experiencing a Hepatitis A epidemic, with over 12,000 cases reported from January to September in South Korea. Reports indicated possible links with salt clams (jeotgal).

A food questionnaire was developed to capture imported Korean foods that had the potential to be contaminated with HAV. All cases brought Kimchi and 75% brought Joet-gal (shrimp, squid or clam), chilli paste, dry seaweed and fish cakes (frozen).

The NSW Food Authority conducted an investigation cross-checking implicated food brands sold at the grocery stores visited by cases. The investigation resulted in a consumer recall of two imported salted clam brands.

Institutional gastrointestinal outbreaks

From 1 July to 30 September 2019, a total of 385 outbreaks of suspected viral gastrointestinal illness in institutions were reported in NSW affecting at least 5339 people (Table 6). This represents an increase of 53% compared to the average number of outbreaks reported during the same quarter from 2014 to 2018 (n=250), and an increase of 28% compared to the mean number of people affected as a result of the gastroenteritis outbreaks during the same quarter from 2014 to 2018 (n=4180).

Of the 385 outbreaks, 261 (68%) occurred in child care centres, 91 (24%) in aged care facilities, 22 (6%) in hospitals and 11 (3%) in other facilities (Table 6). The number of child care centre outbreaks during quarter 3 was 111% higher than the five year quarterly average, but numbers of outbreaks in all other facility types were within average levels (Figure 8).

Overall, 12% of staff members and 16% of non-staff became sick during gastroenteritis outbreaks in quarter 3 (Table 6). The highest attack rate for gastrointestinal disease for staff were in child care centres and hospitals (14% respectively) and for non-staff was in hospitals (34%). Outbreaks lasted seven days on average (Table 6).

One or more stool samples were collected in 129 (34%) of the outbreaks. Norovirus was identified in 73 (57%) of these outbreaks and rotavirus was identified in nine (7%) of these outbreaks. The majority of 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 3 2019 compared to the 5 year quarterly average, by month and facility type

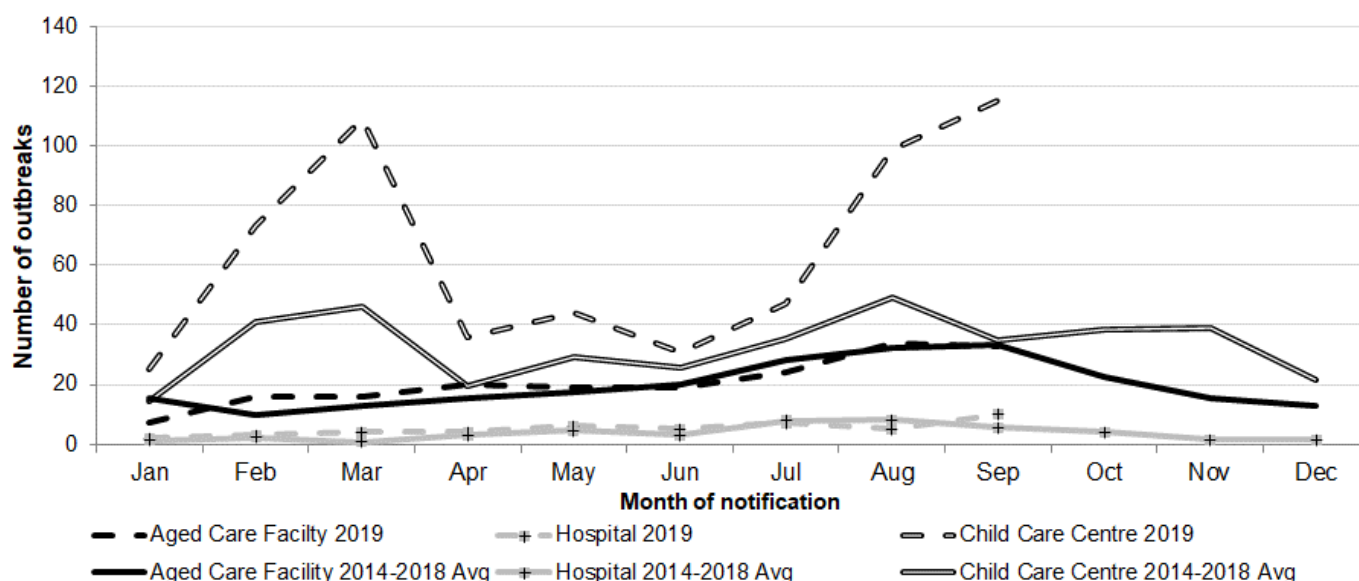


Table 5. Outbreaks of gastroenteritis in institutions reported in NSW, quarter 3 2019, by local health district²

Facility type	Q3 2019	FW	HNE	IS	M	MNC	NBM	NNSW	NS	SES	SNSW	SWS	SYD	WNSW	WS	NSW
ACF	No. of outbreaks	0	9	11	9	0	5	5	9	7	3	11	11	3	8	91
	Staff affected	0	23	86	70	0	30	26	24	5	58	29	50	17	23	441
	Non-staff affectede	0	86	126	178	0	94	59	148	65	107	156	164	54	93	1330
CCC	No. of outbreaks	1	46	23	11	2	37	0	19	23	8	22	24	4	41	261
	Staff affected	1	127	54	15	4	76	0	56	43	15	32	41	14	72	550
	Non-staff affectede	14	420	292	106	18	298	0	173	229	61	191	213	43	369	2427
Hospital	No. of outbreaks	1	0	7	1	0	2	0	0	4	1	2	2	0	2	22
	Staff affected	0	0	41	0	0	32	0	0	15	12	0	9	0	6	115
	Non-staff affectede	8	0	54	4	0	18	0	0	21	2	18	26	0	18	169
Other ¹	No. of outbreaks	0	0	1	0	0	1	0	2	0	1	1	4	0	1	11
	Staff affected	0	0	3	0	0	0	0	1	0	0	21	10	0	5	40
	Non-staff affecte	0	0	3	0	0	4	0	50	0	14	30	160	0	6	267

¹ Other= school, school camp facility, group home, children's health services facility, residential facility

² CC did not report any outbreaks of gastroenteritis in institutions in this period

Table 6. Outbreaks of gastroenteritis in institutions reported in NSW, quarter 3 2019, 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	91	441: 7%	1330: 23%	7	77: 85%	48: norovirus & 3: rotavirus
CCC	261	550: 14%	2427: 12%	7	30: 11%	8: norovirus & 4: rotavirus
Hospital	22	115: 14%	169: 34%	7	19: 86%	16: norovirus & 2: rotavirus
Other ¹	11	40: 10%	267: 27%	5	3: 27%	1: norovirus
Total	385	1146: 12%	4193: 16%	7	129: 34%	73: norovirus & 9: rotavirus

¹ Other= school, school camp facility, group home, children's health services facility, residential facility

METHODS

The data in this report are derived from disease surveillance and outbreak investigation activities undertaken by staff from NSW public health units, Communicable Diseases Branch (CDB), Health Protection NSW, OzFoodNet (OFN) staff and the NSW Food Authority (NSWFA).

Notifiable enteric diseases in NSW

Under the Public Health Act 2010 (NSW), the following enteric diseases and conditions are notifiable in NSW: botulism, *Campylobacter*, cholera, cryptosporidiosis, giardiasis, hepatitis A, haemolytic uraemic syndrome (HUS), hepatitis E, listeriosis, paratyphoid, rotavirus, Shiga toxin producing *Escherichia coli* (STEC/VTEC) infections, shigellosis, salmonellosis, typhoid, institutional gastroenteritis in two or more people, and foodborne disease in two or more people. Individual cases of other enteric diseases such as norovirus infection are not notifiable in NSW.

NSW laboratories report cases of notifiable enteric diseases to public health units (PHUs). Outbreaks of foodborne or suspected foodborne illness and institutional gastroenteritis are reportable by doctors, hospitals, child care centres and aged care facilities. Notifiable disease data are routinely entered by public health unit staff into the NSW Notifiable Conditions Information Management System (NCIMS).

Data sources for this report

Data in this report has been extracted from the NSW Notifiable Conditions Information Management System, NSW OFN Outbreak Database and the NSW Gastroenteritis in Institutions Database, all held by Health Protection NSW.

Data for outbreaks of suspected point-source foodborne enteric diseases were collected from the

NSW Food Authority Notification of Foodborne Illness Outbreak Form, the Public Health Unit Environmental Request Form and the OFN Outbreak Summary Form and entered into an MS Access database. Data for enteric disease outbreaks in institutions with suspected person-to-person transmission of a viral pathogen were entered directly into NCIMS by public health units.

Methods

Data for all notifiable enteric diseases and conditions was extracted from NCIMS using Secure Analytics for Population Health Research and Intelligence (SAPHARI)ⁱ using the calculated date of onset of disease. This is a composite field of the true date of onset provided by the notifying doctor or obtained during case follow-up, the date of specimen collection for laboratory notified cases, the date of notification by the doctor or laboratory, or the date of receipt of notification, whichever is earliest.

The counts of each notifiable enteric disease for quarter 3 2019 were compared with the average annual count for the same quarter for the years 2014 to 2018 using SAS Enterprise Guide and MS Excel at Health Protection NSW.

Individual factors such as possible risk exposures are reported for cases where that information has been collected by the public health unit. "Unknown" place of acquisition usually indicates that the person was in more than one place during their exposure period, so that the place of acquisition cannot be definitively assigned. Possible risk factors are those reported by the case on questioning, and cannot be attributed as the source unless further investigation is undertaken.

ⁱ NSW Health Notifiable Conditions Information Management System (NCIMS), Communicable Diseases Branch and Centre for Epidemiology and Evidence, NSW Ministry of Health.

GLOSSARY

ACF	Aged-care facility	NBM	Nepean Blue Mountains LHD
CC	Central Coast LHD	NNSW	Northern NSW LHD
CCC	Childcare centre	NS	Northern Sydney LHD
FW	Far West LHD	NSW	New South Wales
HNE	Hunter New England LHD	NSWFA	NSW Food Authority
HUS	haemolytic uraemic syndrome	Q	Quarter
ICPMR	Institute of Clinical Pathology and Medical Research	SES	South Eastern Sydney LHD
IS	Illawarra Shoalhaven LHD	SNP	single nucleotide polymorphisms
LHD	Local Health Districts	SNSW	Southern NSW LHD
M	Murrumbidgee LHD	STEC	Shiga toxin-producing <i>Escherichia Coli</i>
MLVA	Multi-locus variable number tandem repeat analysis	SWS	South Western Sydney LHD
MLST	Multi-locus sequence typing	SYD	Sydney LHD
MNC	Mid North Coast LHD	WNSW	Western NSW LHD
N	Number	WS	Western Sydney LHD
NA	Not available	Yr	Year