



**OzFoodNet — Enhancing Foodborne  
Disease Surveillance across Australia.**

**NSW 2013 OzFoodNet Annual Report**

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- The New South Wales Food Authority for management of environmental aspects of outbreak investigations
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### 3. Introduction

This report describes enteric diseases and conditions that are notifiable in NSW. 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.

There are two OzFoodNet (OFN) sites in NSW - one based in Sydney at the Communicable Diseases Branch, Health Protection NSW and the other in Newcastle at Hunter New England Public Health Unit.

The Sydney site's primary role is to coordinate, monitor and report state-wide enteric disease surveillance, investigate state-wide outbreaks and to contribute to enteric disease related policy development in NSW. The team at this site consists of an OFN epidemiologist and an OFN surveillance officer.

The Newcastle site's primary role is to investigate outbreaks that occur within the Hunter New England area, assist with the investigation of state-wide outbreaks, and assist in enteric disease research. The Hunter OFN site comprises an OFN epidemiologist and a research officer. Both sites work closely with the Manager, Enteric Diseases and other Communicable Disease Branch staff.

The management of suspected foodborne disease outbreaks in NSW is the shared responsibility of NSW public health units, Health Protection NSW, NSW OFN sites and the NSW Food Authority. NSW Health is responsible for the human health and epidemiological aspects of outbreak investigations and the NSW Food Authority is responsible for the environmental investigation, food testing and food trace-back components of an outbreak investigation. A Memorandum of Understanding between NSW Health and the NSW Food Authority outlines the roles and responsibilities of each agency, and the Investigation of Foodborne Illness Response Protocol describes the interaction and communication between NSW Health and the NSW Food Authority in relation to foodborne illness surveillance and investigations of food-related outbreaks and complaints in NSW.

#### 3.1 Notifiable enteric diseases in NSW

Under the Public Health Act 2010 (NSW), the following enteric diseases and conditions are notifiable in NSW: 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.<sup>1</sup> Individual cases of other enteric diseases such as campylobacter and 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).

## 3.2 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 CDB.

## 3.3 Methods

We analysed data for the following notifiable enteric pathogens; *Salmonella* (including *Salmonella* Paratyphi),\* *Salmonella* Typhi, *Listeria monocytogenes*, *Shigella*, HUS and STEC, *Cryptosporidium*, *Giardia*, rotavirus and hepatitis A virus. On 28 March 2014, 2013 data was extracted from NCIMS using Secure Analytics for Population Health Research and Intelligence (SAPHaRI)<sup>2</sup> using the date of onset of disease. The NSW estimated resident population for 30 June of each year from 2008-2013 was used to calculate crude incidence rates for each disease.<sup>3</sup>

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. Data from these registers are analysed using MS Excel at the NSW Ministry of Health. Data were reported as received by the Communicable Diseases Branch on 28 March 2014.

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\* We define *Salmonella* as all *Salmonella* serovars, excluding *S. Typhi*, in accordance with the definition of *Salmonella* endorsed by the Communicable Diseases Network of Australia (CDNA).

## 4. Summary

- In 2013, there were 7,549 notifications of the enteric diseases (cryptosporidiosis, giardiasis, hepatitis A, rotavirus, HUS, listeriosis, salmonellosis (including paratyphoid), shigellosis, typhoid and infection with shiga toxin producing *Escherichia coli*) in NSW. This was a 9% increase compared with the average annual disease count for the previous five years.
- Salmonellosis (including paratyphoid) was the most frequently reported enteric condition in NSW during 2013 with a total of 3,420 notifications reported. This is a 13% increase on the average annual count of salmonellosis for the previous 5 years and a 16% increase in notifications compared to 2012.
- Giardiasis was the second most frequently reported enteric condition in 2013. There were 2,189 notifications in the year, an increase of 4% compared with the annual average for the previous five years. No clustering of cases or outbreaks were identified.
- Cryptosporidiosis was the third most frequently reported enteric condition in 2013. There were 1,107 notifications in the year, an increase of 66% compared with the annual average for the previous five years. This increase was predominantly due to notifications associated with public swimming pools in the first quarter of 2013.
- There were 25 notifications of Shiga toxin producing *Escherichia coli* (STEC) in 2013, an increase of 63% compared to the annual average for the previous five years. The cause for this increase is unknown; there was no clustering by location or time. There was no associated increase in haemolytic uraemic syndrome (HUS) with the notification of 8 cases in 2013 remaining consistent with the annual average for the previous five years.
- There were 28 listeriosis notifications received in 2013. This represented a decrease of 3% compared to the annual average for the previous five years (n=29.4) and a decrease of 28% compared to 2012. Five NSW cases were part of a multijurisdictional outbreak associated with soft cheese made by a Victorian cheese producer. The outbreak started in August 2012 and continued into March 2013.
- Rotavirus became a notifiable condition in 2010. There were 486 notifications of rotavirus received in 2013, a 65% decrease when compared to the average notification for the previous 3 years (2010-2012).
- In 2013, 39 foodborne or probable foodborne disease outbreaks were reported affecting at least 417 people, as well as 466 viral or probable viral gastroenteritis outbreaks in institutions affecting 7,199 people. This was a 36% decrease in the number of reported foodborne or probable foodborne disease outbreaks compared to the year 2012 (n=61), and a 42% decrease in the number of reported gastroenteritis outbreaks in institutions compared to the year 2012 (n=803).
- Of the point-source foodborne outbreaks of *Salmonella* Typhimurium, 44% (4/9) were associated with the consumption of food that contained raw or only partially cooked eggs, such as raw egg salad dressing or fried ice-cream. The cases in these egg related outbreaks constituted 69% (77/112) of all *Salmonella* Typhimurium outbreak related cases.

## 5. Activity during 2013

### 5.1 Overview

The counts of each notifiable enteric disease<sup>†</sup> for 2013 were compared with the average annual count for the years 2008 to 2012. Results are presented in Table 1. Overall, there were 7,549 enteric disease notifications in 2013, a 9% increase compared to the average number of cases for the previous 5 years.

**Table 1: Number of selected enteric disease notifications during 2013 compared with the average number of cases, NSW 2008-2012**

Condition	2013	5 year average	% change
Cholera	2	2	0
Cryptosporidiosis	1107	668	66%
Giardiasis	2189	2110	4%
HUS	8	8	0
Hepatitis A	62	70	-11%
Hepatitis E	16	15	7%
Listeriosis	28	29	-3%
Rotavirus	486	1398*	-65%
STEC Infection	24	15	60%
Salmonellosis (including Paratyphoid)	3420	3028	13%
Shigellosis	148	126	17%
Typhoid	59	42	40%
<b>TOTAL</b>	<b>7549</b>	<b>6952</b>	<b>9%</b>

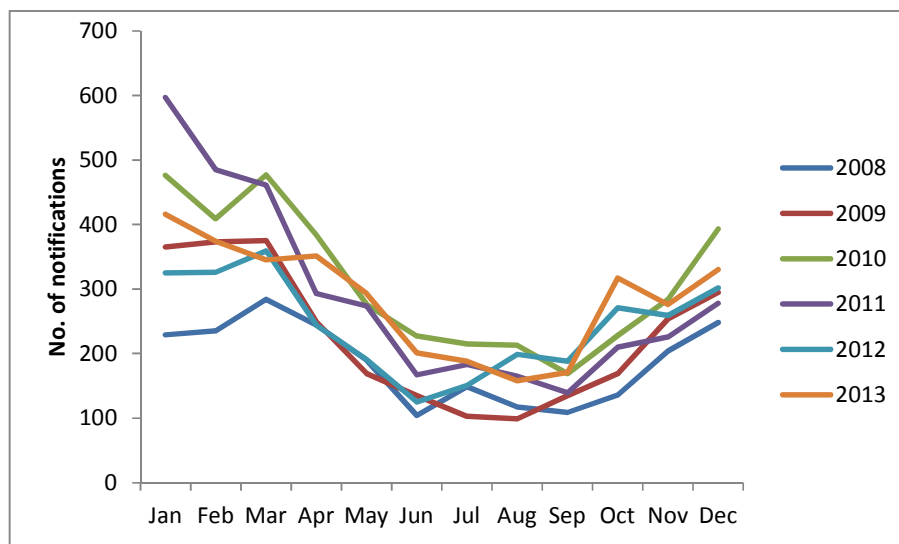
\*Data only available since 2010 for Rotavirus

### 5.2 Salmonellosis (including Paratyphoid)

Salmonellosis (including paratyphoid) was the most frequently reported enteric condition in NSW during 2013. There were a total of 3,420 notifications, which is 13% above the average annual count, 2008-2012 and a 16% increase in notifications compared to 2012. Figure 1 shows the monthly comparison of salmonellosis cases from 2008-2013. The highest total number of notifications was reported in 2010.

<sup>†</sup> Notifiable enteric diseases in NSW include cryptosporidiosis, giardiasis, haemolytic uraemic syndrome, rotavirus, salmonellosis (including paratyphoid), shigellosis, listeriosis, hepatitis A, hepatitis E, typhoid and Shiga toxin-producing *Escherichia coli* (STEC) infection

**Figure 1: Number of salmonellosis cases by month in NSW, 2008 to 2013**



\*Including paratyphoid cases

### 5.2.1 Age and sex distribution of people with salmonellosis

The age distribution of cases in 2013 was very similar to that of previous years with 25% of cases aged 20 to 39 years and 22% of cases aged 0 to 4 years. The age specific rate was lower or roughly the same for each age group in 2013 compared with the average rate for the previous 5 years, except the 40-59 years group which was slightly higher than the average (Table 2). The sex distribution of cases was the same as 2012 with 50% female.

**Table 2: Number and rate\* of salmonellosis cases 2013, compared with 2008-2012 average by age group, NSW**

Age group (in years)	No. cases 2013	% of all cases 2013	Rate 2013	Average no. cases 2008 - 2012	% of all cases 2008-2012	Average rate 2008 - 2012
0-4	764	22%	158.9	715	24%	152.3
5-9	257	8%	55.5	262	9%	59.0
10-19	374	11%	41.2	343	11%	37.7
20-39	865	25%	42.1	791	26%	39.2
40-59	605	18%	30.9	461	15%	24.3
60+	552	16%	36.1	453	15%	32.1
<b>TOTAL</b>	<b>3417</b>	<b>100%</b>		<b>3025</b>	<b>100%</b>	

\*rate per 100,000 population

### 5.2.2 Seasonal trends in salmonellosis infections

In 2013, salmonellosis notifications followed the typical seasonal patterns with an increase in the warmer months. NSW had a very hot and dry period in late September which may have contributed to the highest ever number of salmonellosis notifications for the month of October (Figure 1, above).



### 5.2.3 Ten most frequently notified *Salmonella* infections

In 2013 as in previous years, the most frequently notified *Salmonella* serovar was *S. Typhimurium* (53% of all *Salmonella* cases). *S. Enteritidis* and *S. Virchow* were the next most common serovars which is similar to previous years (Table 3).

**Table 3: Top ten *Salmonella* infections\*, NSW 2012**

Rank	<i>Salmonella</i> serovar	No. notifications
1	Typhimurium	1807
2	Enteritidis	149
3	Virchow	113
4	Paratyphi B bv Java	98
5	Infantis	77
6	Wangata	75
7	Birkenhead	73
8	Saintpaul	49
9	Bovismorbificans	41
10	Stanley	40

\*excludes 133 specimens that were not typed

MLVA (Multiple-Locus Variable number tandem repeat Analysis) typing is used in NSW. MLVA results were available for 90% (1632/1807) of the *S. Typhimurium* cases. In total, 360 distinct MLVA types were reported. The ten most commonly reported MLVA types shown below represent 39% of all typed cases (Table 4).

**Table 4. Top ten *S. Typhimurium* MLVA patterns, NSW 2013**

Rank	STM MLVA	No. cases	Phage Type*
1	3-17-9-12-523	157	135
2	3-9-8-13-523	82	170
3	3-9-7-13-523	72	170
4	3-10-14-12-496	61	9
5	3-10-7-14-523	55	170
6	3-13-11-9-523	49	135a
7	3-9-7-14-523	46	170
8	3-23-23-11-523	43	9
9	3-10-8-9-523	37	44
10	3-17-9-11-523	36	NA

\*Phage typing was not performed on these isolates, the corresponding phage type was determined by historical associations of the MLVA with a Phage Type if available.

## 5.2.4 *Salmonella* Enteritidis

In 2012, there were 149 cases of *S. Enteritidis* infections of varying phage types, which is a 3% decrease compared to 153 cases in 2012. The infection was likely acquired overseas for 85% (n=127) of cases with 46% (58/127) of infections acquired in Indonesia. For the remaining cases, 6% (n=9) were locally acquired and the place of acquisition was unknown for the remaining 9% (n=13) cases. Amongst the locally acquired cases, four different subtypes were detected, PT 1 (2), PT 21 (2), PT 4 and PT 14 (1 case each). None of these cases had a source identified. The subtype was unknown for 2 cases.

## 5.2.5 *Salmonella* Paratyphi

In 2013 there were 131 *Salmonella* Paratyphi cases reported. Of these 25% (33/131) were *S. Paratyphi* A and 75% (98/131) were *S. Paratyphi* B by Java.

### Paratyphoid A

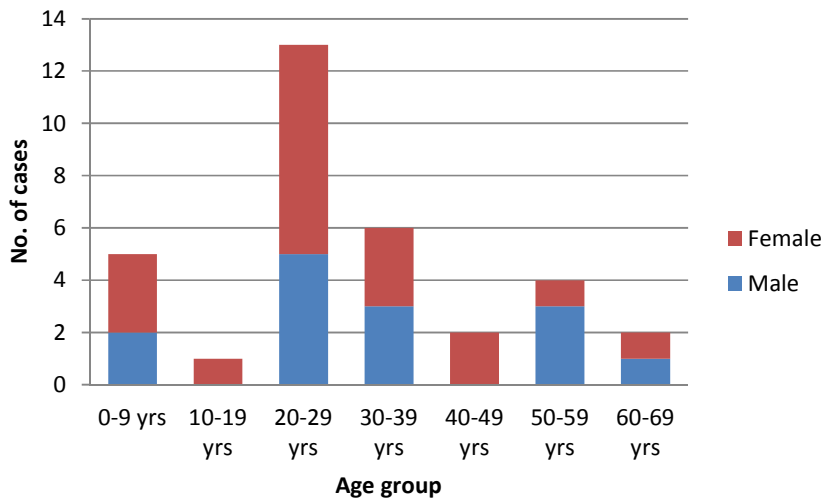
In 2013, there was a 66% increase in *S. Paratyphi* A cases, when compared to 2012, with 33 cases reported (vs 22 cases in 2012). The symptom profile is shown in Table 5 with fever reported in all but 1 case for which information was available. Hospitalisation was required for 73% (24/33) (unknown for 3 cases) of cases with a median length of stay of 4 days (range 1 to 7 days, unknown length of stay for 4 cases).

**Table 5. Symptoms reported for paratyphoid A cases in NSW, 2013**

Symptom	Yes (%)	No (%)	Unknown (%)
Fever	27 (82%)	1 (3%)	5 (15%)
Diarrhoea	12 (36%)	13 (39%)	8 (24%)
Abdominal pain	8 (24%)	10 (30%)	15 (45%)
Headache	15 (45%)	7 (21%)	11 (33%)
Vomiting	8 (24%)	12 (36%)	13 (39%)

The majority of cases were aged between 20-39 years and 42% (14/33) were male (Figure 2).

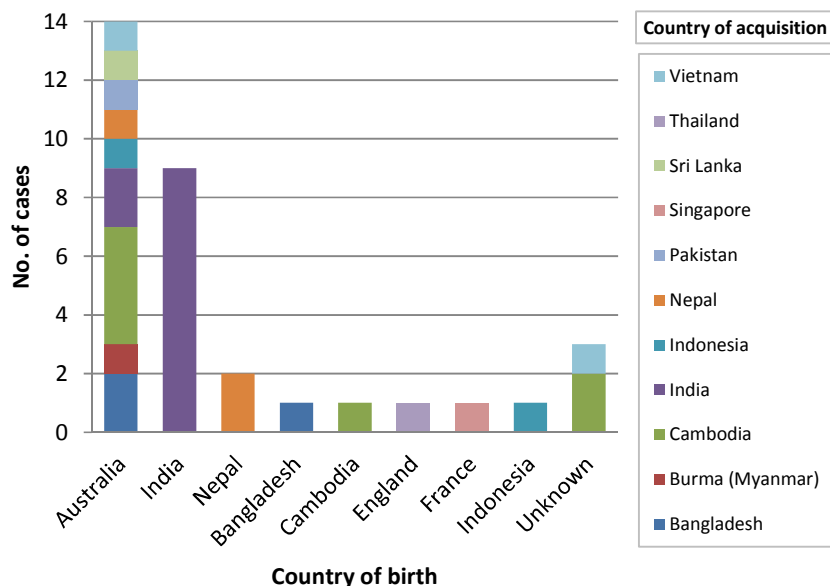
**Figure 2. Paratyphoid A cases by age and sex in NSW, 2013**



All of these cases acquired their infection while travelling overseas with 33% (11/33) acquiring their infection in India. Fifty-seven per cent (19/33) of cases were born outside Australia, 27% (9/33) born in India and 42% (14/33) acquired their infection while travelling to their country of

birth (Figure 3). English was the primary language spoken for 45% (15/33) of cases. An additional 45% of cases (15/33) of cases primarily spoke a language other than English, and this information was not recorded for 3 cases.

**Figure 3. Country of birth by country of disease acquisition for Paratyphoid A cases in NSW, 2013**

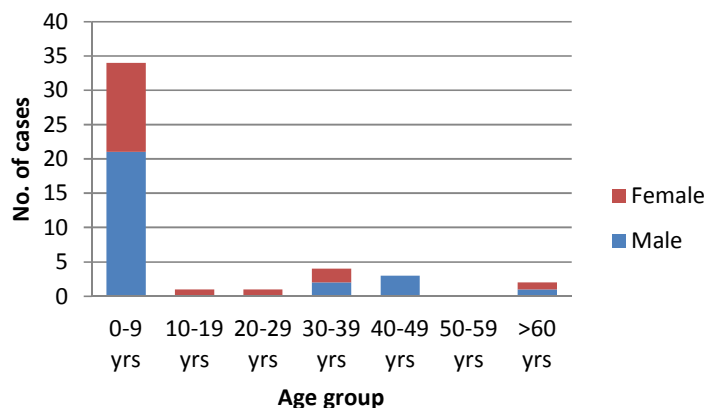


### ***Salmonella paratyphi B. Biovar Java***

*Salmonella paratyphi B. Biovar Java* (also called *Salmonella Java*) notifications in 2013 (n=98) were slightly higher than reported for 2012 (n=83). The place of acquisition was overseas for 36% (35/98) of cases, within Australia for 46% (45/98) and unknown for 18% (18/98) of cases.

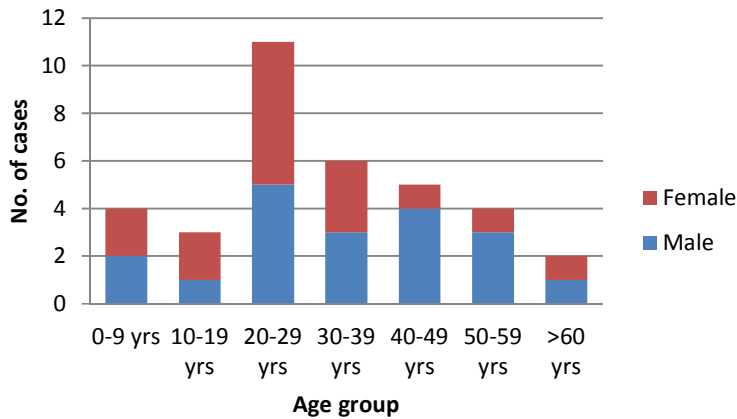
For cases acquired locally, 76% (34/45) were less than 10 years of age (Figure 4). Contact with aquariums and reptiles are known to be associated with *Salmonella Java* infections and in previous years, infections have been epidemiologically and microbiologically associated with sandpits in children’s playgrounds in northern Sydney. Of the 45 locally acquired cases, 71% (32/45) lived in Northern Sydney Local Health District (NSLHD). The risk exposures for the remaining 13 cases included contact with tropical fish (n=4), contact with reptiles (n=1) and visiting the northern Sydney region (n=1). Of the remaining 7 cases, one was unable to be contacted and the others did not report any likely risk exposures on interview.

**Figure 4. Locally acquired *Salmonella Java* cases by age and sex in NSW, 2013**



The overseas acquired *S. Java* cases were most commonly aged between 20-39 years and 54% (19/35) were male (Figure 5). However, unlike paratyphoid A, the most commonly reported country of birth was Australia, 69% (24/35). Travel to Indonesia was reported for 49% (17/35) of cases with travel to Bali specifically reported for 47% (8/17). Other countries included: Thailand (6); Cambodia (3); Malaysia (2); Singapore (2); and Hong Kong, the Maldives, Pakistan, and the Philippines with one case each. For one notification, the country of acquisition was unknown.

**Figure 5. Overseas acquired *Salmonella Java* cases by age and sex in NSW, 2013**



### 5.3 Typhoid fever

In 2013, there was an increase in the number of typhoid notifications with 59 cases compared with 43 in 2012. The majority were acquired overseas, with India being the most commonly reported travel destination (Table 6). Hospitalisation was required for 85% of cases (50/59). 71% (42/59) of cases were aged less than 30 years and 44% (26/59) were male. There were 14 Australian born cases compared with an average of 8 for 2010-2012. Over half of Australian born cases acquired their infection in India (8/14). Of the 42 cases born overseas, 88% (n=37) acquired their infection while travelling to their country of birth. Five cases reported no overseas travel. Of these, three had household contact with a confirmed case, one reported contact with overseas visitors and the source was not identified for one case.

**Table 6: Country of acquisition for overseas acquired typhoid cases, 2010-2013.**

Country of acquisition	2010	2011	2012	2013
India	16	24	24	35
Bangladesh	2	7	9	5
Nepal	1	1		5
Indonesia	2	3	3	3
Pakistan	3	4	2	2
Burma (Myanmar)	0	0	0	1
Cambodia	0	0	1	1
Fiji	2	1	0	1
Samoa	1	3	0	1
Afghanistan	0	0	1	0
Hong Kong (SAR of China)	0	1	0	0
Iran	0	1	0	0
Papua New Guinea	2	0	0	0
Sri Lanka	0	0	1	0
Thailand	2	0	0	0
<b>Total</b>	<b>31</b>	<b>45</b>	<b>41</b>	<b>54</b>

## 5.4 Giardiasis

In 2013, there were 2205 giardiasis notifications received which was a 10% increase when compared to 2012 (n=2009). The median age of cases was 25 years, with ages ranging from 0-89 years. Fifty per cent of cases were male, and 63% were residents of the greater Sydney metropolitan area. No clustering of cases or outbreaks were identified, however individual cases of giardiasis are not routinely investigated in NSW.

## 5.5 Shigellosis

In 2013, 148 cases of shigellosis were reported in NSW, which is a 20% increase compared to 2012 (n=124).

**Table 7: Place of acquisition for shigellosis 2010-2013**

Place of acquisition	2010	2011	2012	2013
Acquired in NSW	45	41	30	62
Acquired interstate	0	1	2	2
Acquired overseas	31	50	70	71
Unknown	41	39	22	13
<b>Total</b>	<b>117</b>	<b>131</b>	<b>124</b>	<b>148</b>

Overseas travel was reported by 48% (71/148) of cases. As was seen in 2012, the most commonly reported travel destination was India (13 cases, 18%) followed by Indonesia (10 cases, 14%). Approximately half (n=35) of the cases known to be acquired overseas were Australian born and half (n=35) were male. The average age was 32 years (range 1 to 80 years). *Shigella sonnei* biotype G was the most common overseas acquired subtype of *Shigella* (23 cases, 32%) followed by *Shigella sonnei* biotype A (13 cases, 18%).

**Table 8: Reported risk exposure for shigellosis cases with no travel history**

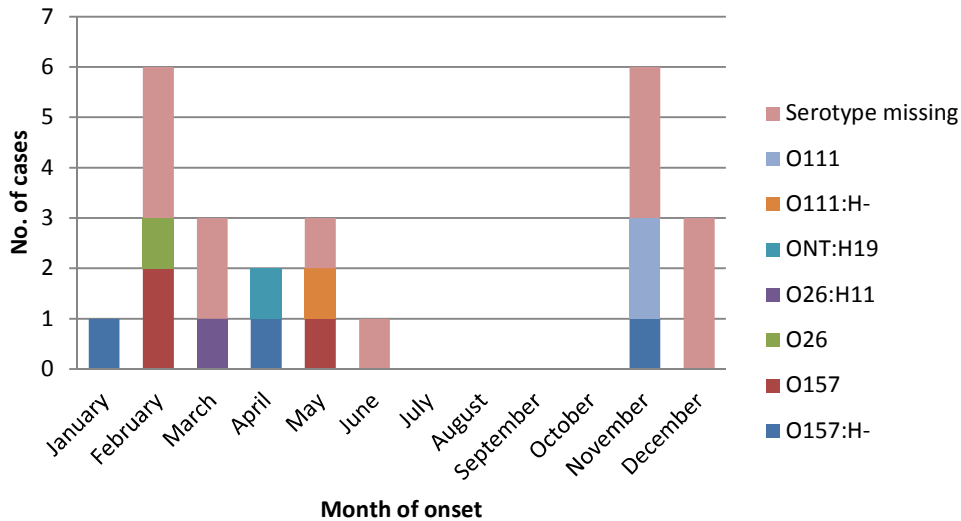
Reported risk exposure	2010	2011	2012	2013
Homosexual sex	10	24	9	29
Household contact with confirmed overseas acquired case	0	1	2	0
Household contact with symptomatic overseas traveller	0	0	4	0
Unknown	35	16	15	33
<b>Total</b>	<b>45</b>	<b>41</b>	<b>30</b>	<b>62</b>

While the number of cases that were acquired overseas remained the same, there was an increase in the number of cases in men who reporting having homosexual sex (29 cases in 2013 vs 9 in 2012). The most commonly reported subtype in these men was *Shigella sonnei* biotype G, accounting for 31% (9/29) of cases, though clusters in time also occurred in men with the subtyping *Shigella sonnei* biotype F (2 cases), *Shigella flexneri* biotype var X (3 cases) and *Shigella flexneri* biotype 3a (4 cases).

## 5.6 STEC and HUS

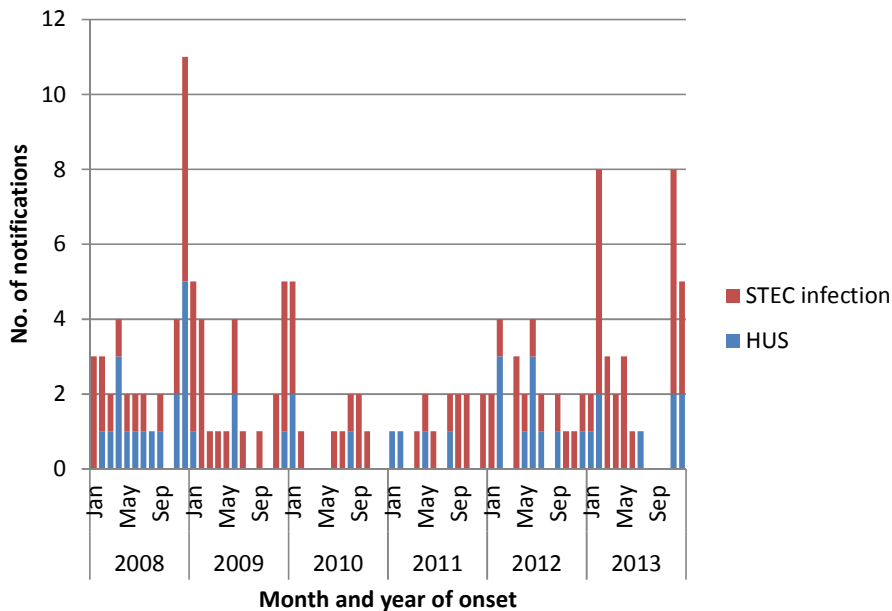
Notifications of Shiga toxin producing *Escherichia coli* (STEC) almost doubled when compared to the previous year with 25 reports received in 2013 (compared to 13 reports received in 2012). This represented a 63% increase in notifications when compared to the five year average from 2008-12 (15 cases) (Figure 7). The median age of cases was 31 years, with an age range of 1–79 years. Fifty per cent of cases were male. Serotype information was available for eight cases (Figure 6), there were two siblings aged 1 and 3 years, no other links between cases were found.

**Figure 6. STEC serotypes by month of onset, 2013**



There were 8 cases of haemolytic uraemic syndrome (HUS) notified in 2013 which is average. The median and mean age was 10.5 and 22.9 years respectively, the age range was 1.1-79.3 years. Six cases had both HUS and STEC infection (serotypes O157:H-, O111 (2 siblings), and 3 untyped). The other two cases reported having a diarrhoeal illness prior to onset of HUS symptoms, however STEC was not detected in stool specimens collected from the patient as a result of the HUS diagnosis.

**Figure 7. STEC and HUS notification by month, NSW 2008-2013**

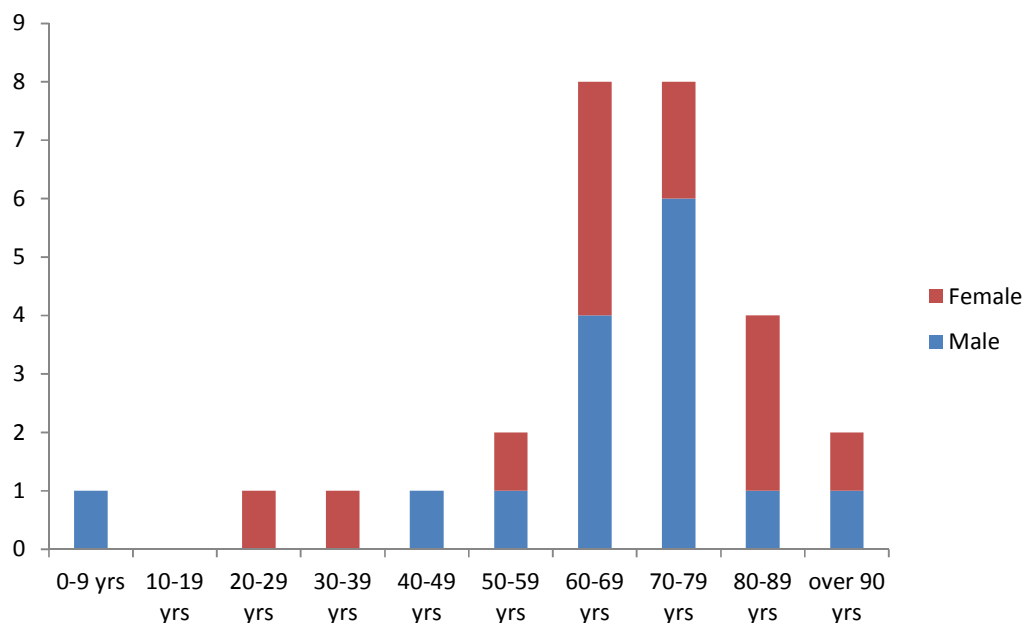


## 5.7 Listeriosis

There were 28 cases of listeriosis reported in 2013 which is comparable to the previous 5 year average of 29.4 cases. Five of these cases were linked to a multi-jurisdictional outbreak associated with soft cheese produced in Victoria. The outbreak started in August 2012 and continued until March 2013. NSW had 12 cases in total linked to this outbreak.

Five cases died (18%) aged 57, 66, 68, 70 & 80 years. The majority of cases were aged over 60 years and had immunosuppressive conditions. Just over half (15/28) of the cases were male (Figure 8). There were two perinatal cases. The first baby was still born. The second baby survived and tested positive for listeriosis on blood culture just after birth. The mother had experienced a non-specific influenzalike illness just prior to the baby being delivered by emergency caesarean. The mother was subsequently tested for listeriosis, but was negative probably due to antibiotic treatment. .

**Figure 8. Listeriosis notifications by sex and age group, NSW 2013**



## 5.8 Cryptosporidiosis

There were 1108 cases of cryptosporidiosis reported in NSW in 2013 which is the second highest annual count since 2000. Notifications peaked in February and March (see Figure 9). With the exception of Port Macquarie all Public Health Units reported a higher annual count than the average of the previous three years (Table 9)

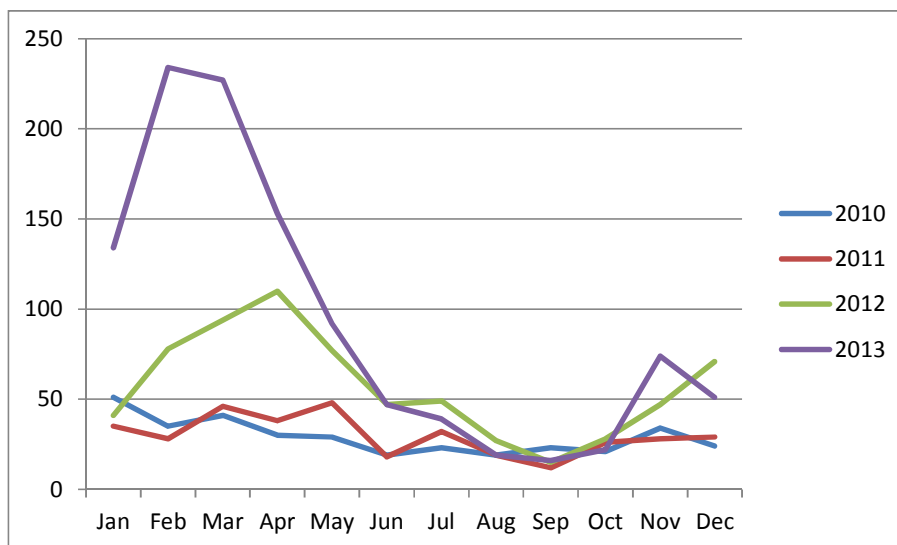
**Table 9: Cryptosporidiosis notifications during 2013 compared with the average number of cases, NSW 2010-2012**

Public Health Unit	2013	Average annual count 2010-2012
Camperdown	97	43
Albury	47	12
Goulburn	21	9
Bathurst	46	11
Broken Hill	2	1

Dubbo	28	7
Newcastle	132	45
Tamworth	21	14
Liverpool	61	24
Lismore	50	24
Port Macquarie	13	17
Gosford	29	21
Hornsby	235	79
Randwick	145	74
Wollongong	44	16
Parramatta	76	47
Penrith	61	20
<b>Total</b>		

In line with previous years, 51% (570/1108) of cases were female. The 2013 increase was seen across all age groups but in accordance with previous years, the majority of cases were reported in children. Infants aged less than 5 years accounted for 40% (435/1108) of cases. The increase is primarily due to an outbreak in the first quarter of 2013 associated with a number of public swimming pools across NSW and particularly in north-eastern Sydney. Forty three per cent of all cases (247) and 61% of cases in north-eastern Sydney (86), reported swimming in public swimming pools prior to the onset of illness. Affected pools were inspected by environmental health officers who confirmed that superchlorination was occurring regularly. A health alert was released by the NSW Ministry of Health on 28/03/2013.

**Figure 9: Cryptosporidiosis notifications by month, NSW 2010 – 2013**



## 5.9 Hepatitis A

In 2013, 62 cases of hepatitis A were reported. While this is higher than the 42 cases reported in 2012, it is in line with the average annual count of 70 over the last 5 years. As has been seen in previous years, nearly three quarters of cases (46/62) acquired the infection while travelling overseas. Another 11% (7/62) were household contacts of those that had travelled overseas and a further 3% (2/62) reported consuming food that relatives had brought back from countries where hepatitis A is endemic. Of the remaining cases, 10% (6/62) were locally acquired and 1 was lost to follow up. One locally acquired case identified as both Aboriginal and Torres Strait Islander.

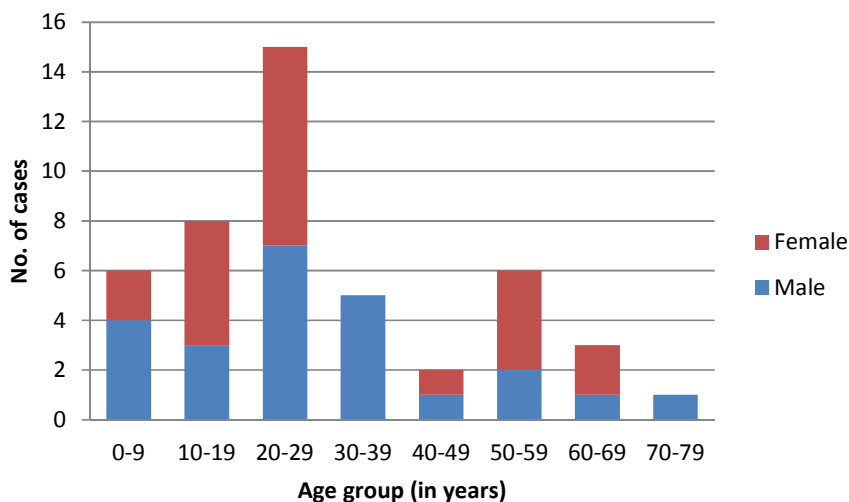


Forty five per cent (28/62) of hepatitis A cases were hospitalised. Almost all (60/62) of the cases had not previously been vaccinated for hepatitis A.

### Hepatitis A cases acquired overseas

Of the 62 overseas acquired cases reported in 2013, 52% (24/46) were male and 63% (29/46) were aged less than 30 years (Figure 10).

**Figure 10: Overseas acquired hepatitis A cases by age and sex, 2013**



**Table 10: Overseas acquired Hepatitis A cases by country of birth, 2013**

Country of birth	Number	%
Australia	25	54
Hepatitis A endemic country*	14	30
Other country	4	9
Unknown	3	7
<b>Total</b>	<b>46</b>	<b>100</b>

\*India n=6, Indonesia n=4, Bangladesh n=2, Iraq n=1 and South Korea n=1.

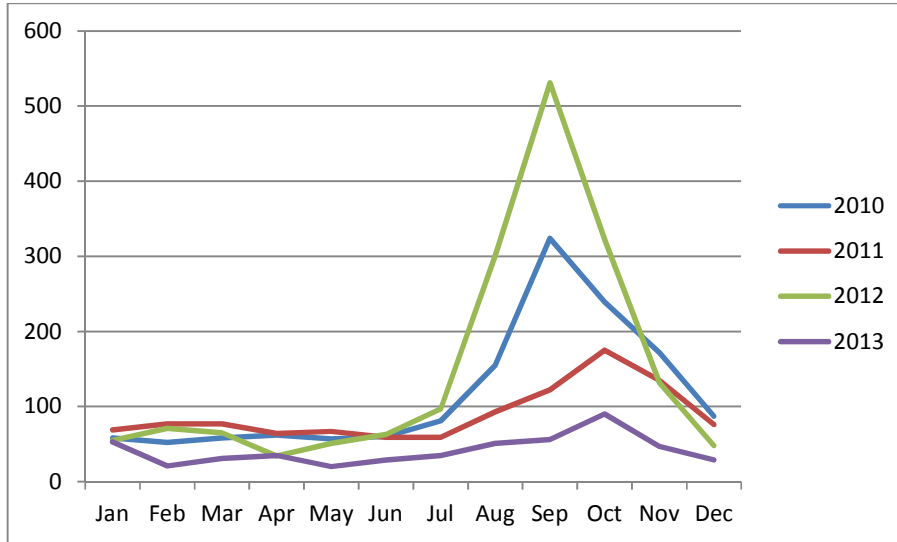
Approximately half of the overseas acquired cases, (25/46) were Australian born (Table 10). Of the 25 Australian born cases, 16% (4/25) primarily spoke a language other than English. As has been noted in previous years, almost all (12/14) of the cases who were born in a country where hepatitis A is endemic, acquired their infection while visiting their country of birth. None of the cases reported travelling as part of an organised tour.

The 25 Australian born cases acquired their infection in 14 different countries in South Asia and South East Asia, the Pacific, Middle East, South America and Sub-Saharan Africa and Europe. None of these cases were Aboriginal or Torres Strait Islanders. Approximately a quarter of these cases (6/25) reported travelling as part of an organised tour.

## 5.10 Rotavirus

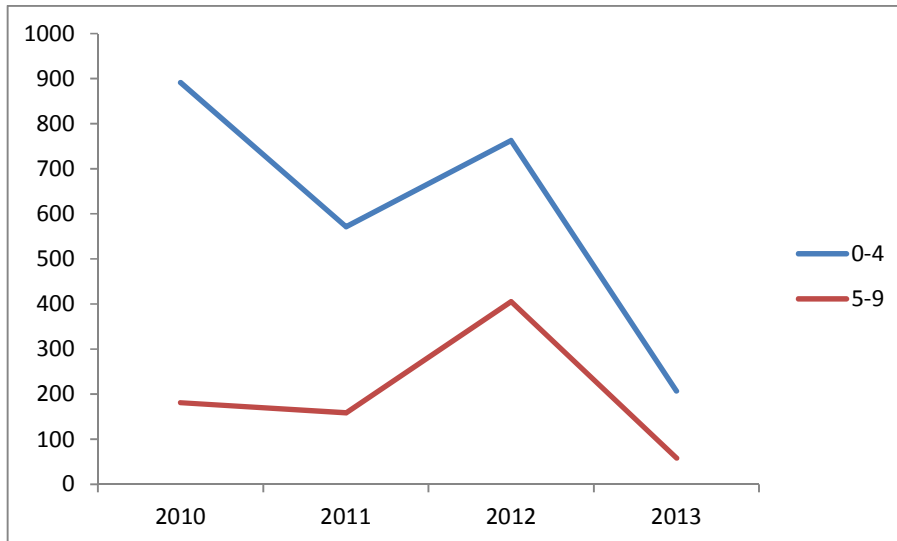
Rotavirus became a notifiable disease in 2010. There was a significant decrease in rotavirus notifications in 2013 with the lowest recorded count of 497 compared with the 1768 notifications reported in 2012. This decrease was observed across all age groups (Figure 11).

**Figure 11: Rotavirus notifications by month, 2010 to 2013**



In line with previous years, 42% (207/497) of notifications were in children aged less than 5 years. Males and females were equally affected. Rotavirus vaccination has been offered to infants through the National Immunisation Program since 2007.

**Figure 12: Rotavirus notifications in children aged less than 10 years, 2010 to 2013**



## 6. Enteric Outbreaks in NSW during 2013

In 2013, there were a total of 505 gastrointestinal outbreaks reported in final summary form to the Communicable Diseases Branch. There were 39 suspected foodborne outbreaks and 466 viral or probable viral gastrointestinal outbreaks in institutions.

### 6.1 Foodborne and suspected foodborne outbreaks

In 2013, 39 foodborne or suspected foodborne disease outbreaks affecting over 417 people were reported to NSW Health. Of these, 56 people (13.4%) were hospitalised compared with 27 of 662 (4.1%) in 2012. In 2013, 1 death was reported to be associated with a suspected foodborne listeriosis outbreak.

In 2013, 31.7% of all cases (132/417) and 92.9% of all hospitalisations (52/56) associated with the 39 reported foodborne and suspected foodborne disease outbreaks, were due to *Salmonella* infections which was the cause of illness in 31% (n=12) of the outbreaks. Of the 12 outbreaks associated with *Salmonella* infection, 9 (75%) were caused by *Salmonella* Typhimurium, one *Salmonella* Birkenhead, one *Salmonella* Zanzibar and one *Salmonella* Cerro (Table 11).

Of the 9 outbreaks associated with *Salmonella* Typhimurium (see table 11 and 12 for MLVA types) infection in NSW in 2013, four outbreaks had compelling epidemiological and/or microbiological evidence implicating a food vehicle. For each of these outbreaks, the responsible vehicles were items containing raw or undercooked egg. For the eight other *Salmonella* outbreaks, the food vehicle could not be determined.

In six more outbreaks, norovirus was identified as the agent responsible (Table 11). In two of these the investigation implicated food vehicles such as salad and wraps. The other outbreaks could not determine the food vehicle although similar foods that do not include a pathogen kill step were served and it was likely the outbreak was caused by the consumption of food at the event that had been contaminated by either a food handler or event attendee. The norovirus outbreaks affected a total of 122 people (average 20 per outbreak) but included no hospitalisations or deaths.

Other pathogens isolated in outbreaks included *Campylobacter* (affecting 17 people) which was associated with a duck liver parfait and *Listeria monocytogenes* (affecting 3 people) which was associated with commercially prepared profiteroles in a hospital setting (Table 11).

For 19 (49%) reported outbreaks the pathogen could not be identified. Possible reasons for this include: cases with gastrointestinal disease do not always seek medical care; not every doctor requests a stool specimen from cases; cases may no longer be excreting the pathogen when they submit the stool specimen; and the very low infective dose of a number of pathogens makes it difficult for the laboratories to detect it in one stool specimen.

For 26 (67%) of the suspected foodborne outbreaks, a (suspected) responsible vehicle could not be found. A possible explanation for this is that the delay between consumption of foods and reporting of illness impairs case recall of foods and ingredients consumed. This also reduces the ability of the NSW Food Authority to obtain specimens of implicated foods and timely environmental samples. In addition, not all reported outbreaks can be properly investigated due to factors such as lack of cooperation from cases (an outbreak is often reported by one case, representing many cases who may not want to collaborate) and prioritisation of resources.

**Table 11: Foodborne disease outbreaks reported in NSW, 2013**

PHU ID number	Month of onset	Setting	Pathogen	No. ill	No. hospitalised	Evidence*	Epi. Study**	Responsible vehicle
*Evidence: D=Descriptive evidence implicating the suspected vehicle or suggesting foodborne transmission; A=Analytical association between illness and food; M=Microbiological confirmation in the suspected vehicle and cases; AM=Analytical and microbiological evidence.								
**Epi Study: C=Cohort study; CC=Case control study; D=Descriptive case series; N=Individual patient data not collected								
HUN0475	Sep	restaurant	Campylobacter	17	1	D	C	Duck liver parfait
SSW201302	Apr	hospital	Listeria monocytogenes	3	3	M	D	Chocolate profiteroles
HUN0469	Jan	restaurant	Norovirus	3	0	D	D	Salad
HUN0474	Sep	restaurant	Norovirus	5	0	D	D	Unknown
SSW35034	Feb	restaurant	Norovirus	15	0	D	N	Unknown
HUN0473	Aug	restaurant	Norovirus	16	0	A	D	Unknown
WS34857	Feb	restaurant	Unknown	4	0	D	D	Beef taco
HUN0478	Oct	grocery store	Norovirus	14	0	A	C	Sandwich wraps
NS38443	Dec	restaurant	Norovirus	69	0	D	C	Unknown
NC201301	Feb	private residence	<i>Salmonella</i> Birkenhead	12	3	D	N	Unknown
HUN0468	Dec	restaurant	<i>Salmonella</i> Cerro	3	1	D	D	Unknown
HUN0470	Apr	restaurant	<i>Salmonella</i> Typhimurium MLVA 3-17-9-12-523	16	3	D	CC	Unknown

PHU ID number	Month of onset	Setting	Pathogen	No. ill	No. hospitalised	Evidence*	Epi. Study**	Responsible vehicle
SES201303	Apr	private residence	<i>Salmonella</i> Typhimurium MLVA 3-13-11-9-523	3	3	D	N	Unknown
NS37886	Oct	bakery	<i>Salmonella</i> Typhimurium MLVA 3-10-7-14-523	49	21	M	D	Vietnamese-style rolls. Likely raw egg mayo and cross contamination
SES34634	Jan	take-away	Unknown	3	0	D	D	Chicken burger
WS35000	Feb	take-away	Unknown	2	0	D	N	Unknown
SES201304	Jun	private residence	<i>Salmonella</i> Typhimurium MLVA 3-23-23-11-523	17	5	D	D	Béarnaise sauce
HUN0471	Jun	restaurant	Unknown	5	0	D	D	Unknown
HUN0472	Jun	restaurant	Unknown	5	0	D	D	Unknown
NS201301	Jun	private residence	Unknown	3	0	D	N	Unknown
NS35433	Apr	restaurant	Unknown	3	0	D	N	Chicken burger
NS35476	Apr	commercial caterer	Unknown	10	0	D	N	Unknown
SES201301	Mar	private residence	<i>Salmonella</i> Typhimurium MLVA 3-17-9-12-523	4	4	D	D	Raw egg smoothies
NS37224	Aug	restaurant	Unknown	38	0	D	C	Unknown
SES37212	Aug	restaurant	Unknown	6	0	D	D	Unknown
SSW201303	Jul	take-away	Unknown	6	0	D	D	Hamburger with salad

PHU ID number	Month of onset	Setting	Pathogen	No. ill	No. hospitalised	Evidence*	Epi. Study**	Responsible vehicle
SSW36617	Jul	restaurant	Unknown	12	0	D	D	Unknown
SSW37179	Aug	restaurant	Unknown	3	0	D	D	Unknown
WS36575	Jul	restaurant	Unknown	8	0	D	D	Unknown
SES201302	Jan	take-away	<i>Salmonella</i> Typhimurium MLVA 3-17-9-12-523	3	3	D	N	Unknown
HUN0476	Sep	restaurant	Unknown	2	0	D	D	Unknown
NC201302	Jan	private residence	<i>Salmonella</i> Typhimurium MLVA 3-27-8-21-496	8	2	D	N	Unknown
HUN0480	Nov	restaurant	Unknown	8	0	D	D	Unknown
NC34848	Feb	restaurant	<i>Salmonella</i> Typhimurium MLVA 3-9-7-14-523	7	3	M	D	Fried ice cream (undercooked egg)
GS201301	Jan	restaurant	<i>Salmonella</i> Typhimurium MLVA 3-9-8-9-523	5	0	D	D	Unknown
III35545	Apr	restaurant	Unknown	15	0	D	N	Unknown
SSW35618	Apr	restaurant	Unknown	4	0	D	N	Beef and Guinness pie
WS35756	Apr	restaurant	Unknown	6	0	D	N	Unknown
SSW201301	Apr	unknown	<i>Salmonella</i> Zanzibar	5	4	D	N	Unknown

**Table 12: *Salmonella* by serotype and MLVA type associated with foodborne outbreaks in NSW, 2013\***

<i>Salmonella</i> serotype	MLVA type	No. of outbreaks (cases)
<i>Salmonella</i> Typhimurium	MLVA 3-17-9-12-523	3 (23)
<i>Salmonella</i> Typhimurium	MLVA 3-9-7-14-523	1 (7)
<i>Salmonella</i> Typhimurium	MLVA 3-9-8-9-523	1 (5)
<i>Salmonella</i> Typhimurium	MLVA 3-10-7-14-523	1 (49)
<i>Salmonella</i> Typhimurium	MLVA 3-13-11-9-523	1 (3)
<i>Salmonella</i> Typhimurium	MLVA 3-23-23-11-523	1 (17)
<i>Salmonella</i> Typhimurium	MLVA 3-27-8-21-496	1 (8)
<i>Salmonella</i> Birkenhead		1 (12)
<i>Salmonella</i> Cerro		1 (3)
<i>Salmonella</i> Zanzibar		1 (5)

\* MLVA method and type designation were as described by Wang et al (2008) with modification of the fifth locus designation using the original size<sup>4</sup>.

## 6.2 Summary of significant foodborne outbreaks during 2013

### ***Salmonella* Typhimurium (MLVA type 3-9-7/8-14-523) infection associated with fried ice-cream at a restaurant**

Information was received by a PHU of three groups of people that ate at a restaurant in February 2013 and subsequently became ill with gastrointestinal illness. Upon interview by the PHU, seven out of a total of ten people interviewed had consumed fried ice cream and all developed illness. All cases had stool samples that tested positive for *Salmonella* Typhimurium (MLVA 3-9-7-14-523 or 3-9-8-14-523). The NSWFA inspected the restaurant and took samples of frozen and cooked fried ice-cream balls that were made in the days following the visits by the salmonellosis cases. All sampled fried ice-cream balls tested positive for *Salmonella* Typhimurium (MLVA 3-9-7-14-523 or 3-9-8-14-523). The restaurant proprietor was warned about the risks of preparing fried ice cream with raw eggs and was fined for the sale of unsafe food. The NSWFA also inspected the egg farm that supplied the restaurant and found *Salmonella* Typhimurium with the same MLVA pattern on an egg rinse sample. (NC34848)

### ***Salmonella* Typhimurium (MLVA type 3-17-9-12-523) infection associated with raw eggs in a private residence**

A cluster of *Salmonella* Typhimurium (MLVA 3-17-9-12-523) notified by a hospital from a family of four was investigated by the PHU. They were admitted to a hospital with salmonellosis in March 2013. The only common risk food consumed prior to this was banana smoothies made with milk and raw eggs. They had been eating these smoothies daily. The eggs came from a small boutique free-range egg farm. The family were provided with information about salmonellosis and the risks involved with eating raw eggs and they have discontinued this practice. (SES201301)

### ***Listeria monocytogenes* infection associated with chocolate profiteroles in hospital patients**

In April, three hospital inpatients were notified to a PHU with listeriosis within eight days of each other. One patient died and the other two recovered after serious illness. All three inpatients were in hospitals within adjacent local health districts during their incubation period. A public health investigation was commenced to determine whether the three cases were linked through the consumption of contaminated hospital food. The specimens were all indistinguishable by binary type (223), serotype (1/2b, 3b, 7), PFGE (4A:4:1), and MLVA (04-17-16-05-03-11-14-

00-16), indicating a common source. Food and menu histories revealed that the three cases had consumed chocolate profiteroles from the same external commercial supplier on the same day. Products from this company were then withdrawn from all relevant NSW hospitals. The NSW FA conducted investigations on the external commercial supplier and found that they had a profiterole test positive for *Listeria* (unspecified) prior to this incident that had not been reported at the time as this was not a requirement. Two environmental swabs from the premises tested positive for *Listeria monocytogenes*. One of these samples was indistinguishable by MLVA from that found in the cases. *Listeria innocua* was also found in swab samples at the factory site. NSW Health Service Support, (providers of food services to NSW public hospitals), have tightened requirements about *Listeria* control in foods served to patients. (SSW201302)

#### ***Salmonella* Typhimurium (MLVA 3-23-23-11-523) infection associated with undercooked eggs in a private residence**

A PHU was notified of salmonellosis cases associated with a privately prepared dinner party in June 2013. Fourteen of 17 attendees became unwell following a meal that contained a minimally cooked béarnaise sauce (containing raw egg). In addition, three people who did not attend the dinner party but consumed leftover food from the dinner party, including the béarnaise sauce, also became unwell. Five of the cases were positive for *Salmonella* Typhimurium MLVA type 3-23-23-11-523. The chef who cooked the meals for the dinner party was provided information about salmonellosis and the risks of using raw or minimally cooked eggs in food. (SES201304)

#### ***Campylobacter* infection associated with duck liver parfait at a wedding function**

An outbreak of gastroenteritis affecting people who attended a wedding reception on 13 July 2013 in the Hunter Valley was notified to the PHU. A retrospective cohort study was conducted by HNE OzFoodNet including all people who had attended the wedding (n=50). Thirty attendees were interviewed by telephone, of whom 17 (57%) reported symptoms. The symptoms began a median of 24 hours after food service began at the function. Symptoms reported included: diarrhoea (n=17, 100%), abdominal pain (n=12, 71%), fever (n=9, 53%), nausea (n=7, 41%) and vomiting (n=3, 18%). The median duration of illness was 4 days. One attendee was admitted to hospital. One stool specimen was collected and was positive for *Campylobacter*. There was no illness identified in wedding attendees prior to the ceremony or reception. No one reported either being ill, or hearing of someone who was ill, at the wedding or reception. In a univariate analysis, the strength of association between becoming ill and 17 food and drink exposures at the wedding reception or attending a pre wedding function on the night before were calculated. The only significant association with illness was for consumption of the duck entree that contained duck liver parfait (Relative risk 4.3, 95% confidence intervals 1.2 to 15.5). Fifteen of the 17 cases (88.2%) ate the duck entrée. The NSW Food Authority visited the reception venue to review the preparation and handling of foods served at the reception. No food samples were available for collection but the chefs were advised of the proper cooking method required to render poultry livers free from bacterial pathogens. (HUN0475)

#### ***Salmonella* Typhimurium (MLVA type 3-10-7-14-523) infection associated with raw egg at a bakery**

A PHU were notified of seven people with gastrointestinal illness who presented to an emergency department. *Salmonella* was isolated in two of these people's stools. All cases reported eating Vietnamese rolls from a bakery. The PHU conducted case finding of *Salmonella* cases and of contacts and identified 46 people with gastrointestinal illness after eating at this bakery with an onset of illness between 19-23 October 2013. There were also three secondary cases notified to the PHU. *Salmonella* Typhimurium (MLVA 3-10-7-14-523) was identified in 36 stool specimens submitted. The cases reported eating Vietnamese rolls with a variety of fillings. The premises were inspected by the NSWFA and it was reported that raw egg



mayonnaise was a standard ingredient on the rolls. A Prohibition Order was issued on the service of Vietnamese rolls and their ingredients. However the business had already stopped serving the rolls after receiving customer complaints prior to the NSWFA visit. None of the raw egg mayonnaise was available at the time of inspection but other samples (pate, lettuce and a cool room swab) were positive for *Salmonella* Typhimurium of the same MLVA pattern suggesting a cross-contamination incident. The premises and equipment were re-swabbed to gauge the efficacy of their deep cleaning and sanitising post Prohibition Order. All swabs were negative for *Salmonella*. The owner and staff were assessed for required skills and knowledge which was at the time found to be satisfactory. The business is no longer selling ready-to-eat sandwiches but if there is an application to lift the Order further sampling and operational evaluation will have to be considered by the NSWFA. Trace back on the eggs was conducted but due to a long chain of resale the exact farm could not be definitively determined. (NS37886)

### **An outbreak of Norovirus associated with food served at a function**

A PHU was notified of approximately 69 people out of a group of 96 who had gastrointestinal illness after eating at a function at a restaurant on 5 December 2013. An online survey was initiated and was completed by 47 guests (43 cases). Onsets ranged from 9 hours to 3 days after eating (median 24 hours), with symptoms of diarrhoea, vomiting, nausea, abdominal cramps, fever, headaches, muscle aches and lethargy lasting 2-3 days. The responses indicated a viral gastrointestinal illness with evidence of further person to person spread in family members who had not attended the dinner. Staff of the restaurant also showed evidence of a similar gastrointestinal illness with onset of illness reported in the same period as the group. One stool specimen was later confirmed to contain norovirus. Food included shared mezze plates of seafood and other cold dishes and alternate meals for main and dessert, however due to the small number of controls interviewed most foods showed high attack rates. NSWFA inspected the restaurant and found hygiene, cleaning and sanitising to be satisfactory. A raw egg aioli was being used, but the illness does not appear to be associated with this food as it was only given to alternate persons and the disease is not indicative of salmonellosis. The restaurant was advised about the risks of using raw egg however and offered alternatives. Based on the incubation period and high attack rate, the likely cause of the illness was a person attending on the night of the function that was shedding norovirus onto the shared food. (NS38443)

## **6.3 Institutional gastrointestinal outbreaks**

In 2013, PHUs reported 466 gastroenteritis outbreaks in institutional settings likely to be due to person-to-person transmission of viral gastroenteritis. The outbreaks affected 7,199 people compared with 803 outbreaks affecting 13,803 people in 2012. Of these outbreaks, 189 (40.6%) occurred in aged care facilities (average 20 cases per outbreak), 188 (40.3%) in childcare centres (average 13 cases per outbreak), 75 (16.1%) in hospitals (average 14 cases per outbreak), 4 (0.9%) in residential care facilities (average 11 cases per outbreak), 5 (1.1%) in military facilities (average 26 cases per outbreak), 4 (0.9%) in schools (average 18 cases per outbreak) and 1 (0.2%) in a correctional facility (14 cases) (Table 13).

One or more stool samples were collected in 242 (51.9%) outbreaks. Norovirus was the most commonly identified pathogen in stool specimens collected during outbreak investigations. Norovirus was identified in one or more stool specimens in 122 outbreak investigations (26.2% of all outbreaks, 50.4% of outbreaks with specimens collected). Rotavirus was identified in stool specimens in 7 outbreak investigations (1.5% of all outbreaks, 2.9% of outbreaks with specimens collected). In 19 outbreak investigations more than one pathogen was identified.

Other pathogens identified in one or more stool specimens collected during outbreak investigations were *Cryptosporidium* (1 specimen in 4 outbreaks), *Clostridium difficile* (range of 1-3 specimens in 20 outbreaks), *Campylobacter* (1 specimen in 1 outbreak), *Giardia intestinalis* (1-2 specimens in 5 outbreaks), adenovirus (1 specimen each in 2 outbreaks), *Blastocystis hominis* (1 specimen in 1 outbreak) and *Salmonella* (1 specimen in 2 outbreaks). These pathogens were believed to be incidental findings and not the cause of the outbreak, as the clinical symptoms and the epidemiology of the outbreaks indicated person-to-person transmission of a viral pathogen. In the majority (17/29, 59%) of the outbreaks where one of these pathogens was identified, it was identified in tandem with a viral pathogen.

The aetiology was unknown for 323 (69.3%) of the outbreaks. For 224 outbreaks (48.1%) no stool or other samples were collected for testing. Although laboratory evidence was not available for these outbreaks, the epidemiological information indicated person-to-person transmission of a viral pathogen.

**Table 13: Number of (probable) viral gastroenteritis outbreaks and number of cases by institution, NSW 2009 – 2013**

Institution	2009		2010		2011		2012		2013	
	No. outbreaks	No. cases	No. outbreaks	No. cases	No. outbreaks	No. cases	No. outbreaks	No. cases	No. outbreaks	No. cases
Aged Care	317	7681	248	5166	242	5293	385	8105	189	3772
Hospital	116	1632	73	1603	101	1476	101	1447	75	722
Childcare	143	1981	183	2441	164	2052	299	4002	188	2447
School	3	68	3	29	3	64	2	36	4	70
Other	21	317	10	119	20	333	16	213	10	188
<b>TOTAL</b>	<b>600</b>	<b>11679</b>	<b>517</b>	<b>9359</b>	<b>530</b>	<b>9218</b>	<b>803</b>	<b>13803</b>	<b>466</b>	<b>7199</b>

## 7. Activity in NSW during 2013

### 7.1 Publications

- *Salmonella* and egg-related outbreaks. Cameron R M Moffatt, **Jennie Musto**. *Microbiology Australia* 05/2013; 34(2):94-98.
- EpiReview: Typhoid fever, NSW, 2005-2011. Praveena Gunaratnam, Sean Tobin, Holly Seale, **Jennie Musto**. *New South Wales Public Health Bulletin* 11/2013; 24(2):87-91.
- An investigation of *Salmonella* Typhimurium linked to contaminated eggs on the Central Coast of NSW, 2008. Adam T Craig, **Jennie A Musto**, Therese F Carroll, April R Roberts-Witteveen, Rod A McCarthy, Qinning Wang. *New South Wales Public Health Bulletin* 11/2013; 24(2):99-101.

### 7.2 Prevention Measures

- Public health alerts were released during the national listeriosis outbreak in January and during a hospital acquired listeriosis cluster in April 2013. An alert was also issued about hygiene in swimming pools, after an increase of cryptosporidiosis was reported in March 2013.

## 9. References

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<sup>1</sup> New South Wales Health. Information Bulletin 2013\_010: Notification of Infectious Diseases under the NSW Public Health Act 2010. Issued 25 February 2013. Sydney: NSW.

<sup>2</sup> NSW Health Notifiable Conditions Information Management System (NCIMS), Communicable Diseases Branch and Centre for Epidemiology and Evidence, NSW Ministry of Health.

<sup>3</sup> Australian Bureau of Statistics. Estimated resident populations based on 2001 Census counts and mid-series experimental population projections.

<sup>4</sup> Wang Q, Kong F, Jelfs P, Gilbert GL. 2008. Extended phage locus typing of *Salmonella enterica* serovar Typhimurium, using multiplex PCR-based reverse line blot hybridization. *J Med Microbiol*, 57:827-38.