

# OzFoodNet

Enhancing Foodborne Disease Surveillance Across Australia

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## NSW ANNUAL REPORT

2019



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# GLOSSARY

ACF	Aged-care facility	NA	Not available
CC	Central Coast LHD	NBM	Nepean Blue Mountains LHD
CCC	Childcare centre	NNSW	Northern NSW LHD
DPI	Department of Primary Industries	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>
MDR	Multi-drug resistant	SWS	South Western Sydney LHD
MLVA	Multi-locus variable number tandem repeat analysis	SYD	Sydney LHD
MLST	Multi-locus sequence typing	WGS	Whole genome sequencing
MNC	Mid North Coast LHD	WNSW	Western NSW LHD
N	Number	WS	Western Sydney LHD
		Yr	Year

# SUMMARY – ENTERIC INFECTIONS IN NSW

This report summarises NSW enteric disease surveillance data for viral, bacterial and parasitic pathogens for 2019, changes in notifications over time, and other activities in 2019. NSW Health undertakes surveillance of enteric diseases to monitor trends and identify outbreaks, with the aim of implementing control measures to prevent further illness within the community. Disease notification represents only a portion of cases in the community, as it usually relies on people seeing a doctor, and the doctor ordering a test that detects the infection, to generate a notification.

## Cases of infection and incidence 2019

Notifications of enteric conditions: 20,977

Reported hospitalisations: 680

Reported deaths: 15

Notification rate per 100,000 population: 260.9

## Notified incidence and reported hospitalisation due to enteric pathogens in NSW, 2019

	5Yr annual mean	N 2019	% change	Notified Rate	Reported Hospitalisation <sup>a</sup>
Campylobacteriosis <sup>b</sup>	N/A	10679	N/A	132.3	10
Salmonellosis	3942.2	3510	-11%	43.5	273
Giardiasis	3179.4	3273	3%	40.5	1
Rotavirus	1122.6	1803	61%	22.3	54
Cryptosporidiosis	923.6	667	-28%	8.3	52
Shigellosis	290.0	856	195%	10.6	93
Hepatitis A	68.6	57	17%	0.7	37
Typhoid	46.6	62	33%	0.8	47
STEC	46.8	78	67%	1.0	44
Paratyphoid	23.2	37	59%	0.5	29
Listeriosis	24.6	17	-31%	0.2	16
Hepatitis E	21.0	24	14%	0.3	18
Haemolytic Uremic Syndrome	5.4	5	-7%	0.1	5
Botulism	0.4	1	150%	0.0	1
Cholera	0.4	0	-100%	0	0
<b>TOTAL</b>	<b>N/A</b>	<b>20977</b>	<b>NA</b>	<b>260.9</b>	<b>680</b>

<sup>a</sup> Hospitalisations may be underestimated as counts are limited to those infections investigated by a public health unit

<sup>b</sup> Campylobacteriosis became a notifiable condition in April 2017. Data from previous years is not available, thus a 5yr mean cannot be calculated.

## Key points for 2019

- Campylobacteriosis was the highest enteric pathogen notified in 2019. Since its introduction as a notifiable condition in NSW in April 2017, Campylobacteriosis notifications have exceeded all other enteric infections (page 6).
- Shigellosis notifications increased by 195% compared to the five year annual average (2015-2019). This increase can be partly attributed to a change in the national surveillance case definition that was implemented on 1 July 2018, which introduced a new 'probable case' category (pages 15-16).
- Increase in notifications of STEC may be driven by the use of a more sensitive test.

## Reported enteric disease outbreaks

53 foodborne or potentially foodborne disease outbreaks were reported affecting at least 598 people; a 6% increase in the number of reported foodborne or probable foodborne disease outbreaks compared to 2018 (n=50).

1225 viral or probable viral gastroenteritis outbreaks in institutions were reported, affecting at least 15935 people; a 79% increase in the number of reported gastroenteritis outbreaks in institutions compared to 2018 (n=684).

# CAMPYLOBACTERIOSIS

Campylobacteriosis is a disease caused by bacteria known as *Campylobacter*, usually through contaminated food and contact with unwell animals. It usually causes diarrhoea, abdominal pain, fever, malaise, nausea, and sometimes vomiting. Notified cases are usually only investigated if they are part of, or suspected to be part of, an outbreak.

## Summary 2019

- Case count: 10,679
- Reported hospitalisations: 10\*
- Reported deaths: 0
- Notification rate per 100,000: 132.3

\*Hospitalisations may be underestimated as most campylobacteriosis cases are not interviewed by public health officers

## Overall trend

- Campylobacteriosis became a notifiable condition on 7 April 2017. Notifications of campylobacteriosis exceeded all other enteric diseases in 2019.

## Groups with highest notification rate in 2019

Age: <5 years (10% of cases – 200.2 per 100,000)  
 Sex: Male (57% of cases – 151.5 per 100,000)  
 LHD: Murrumbidgee (5% of cases – 215.0 per 100,000)

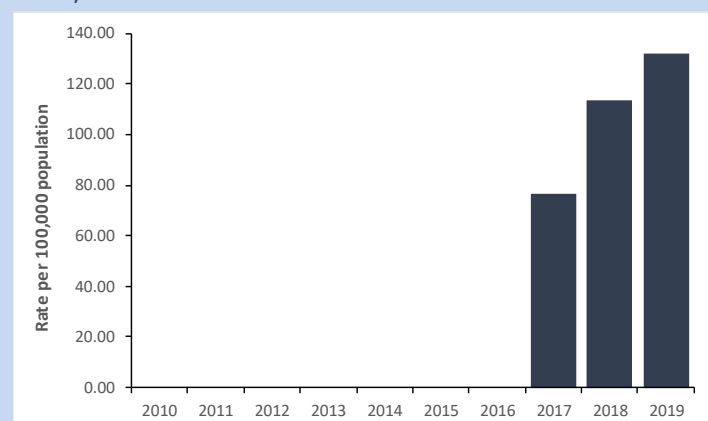
## Seasonality

Campylobacteriosis notifications were highest in the warmer months, notable in January 2019 (n=943) and November 2019 (n=925)

## Outbreaks

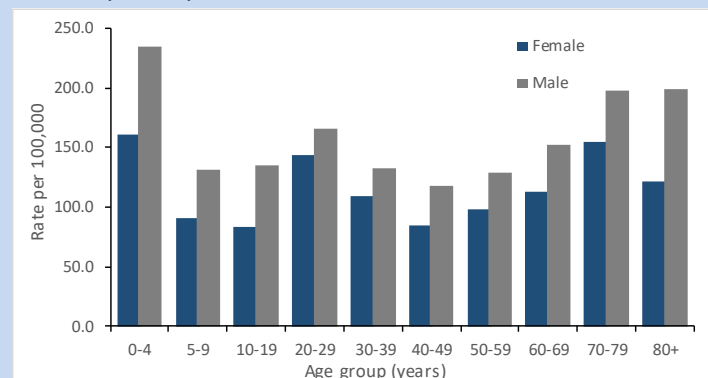
Cases found to be associated with an outbreak: 5 (0.05%) (pages 30-39)

Notification rate per 100,000 population by year, 2018 – 2019, NSW



\* Campylobacteriosis became a notifiable condition on 7 April 2017, therefore 2017 notifications only represents 9 months of data.

Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	-	489	-	140.3
FW	-	31	-	103.1
HNE	-	1062	-	112.7
IS	-	584	-	140.4
M	-	523	-	215.0
MNC	-	283	-	126.7
NBM	-	400	-	103.8
NNSW	-	484	-	157.7
NS	-	1836	-	194.2
SES	-	1456	-	153.6
SWS	-	827	-	81.1
SNSW	-	279	-	104.2
SYD	-	855	-	124.5
WNSW	-	421	-	148.4
WS	-	1147	-	111.7
NSW	-	10679	-	132.3

\* Became notifiable in 2017; no 5yr average can be reported

# SALMONELLOSIS

Salmonellosis is caused by infection with bacteria called *Salmonella*. In Australia, most *Salmonella* infections occur after eating contaminated food; and sometimes after close contact with another person with salmonellosis or animals. Notified cases are usually only investigated if they are part of, or suspected to be part of, an outbreak.

## Summary 2019

- Case count: 3510
- Reported hospitalisations: 273\*
- Reported deaths: 4
- Notification rate per 100,000: 43.5

\*Hospitalisations may be underestimated as not all *Salmonella* cases are interviewed by public health officers

## Overall trend

- 15% decrease in the 2019 notification rate compared to the 5 year annual mean (50.9 per 100,000)

## Groups with most notifications in 2019

- Age: <5 years (24% of cases – 157.8 per 100,000)
- Sex: Female (51% of cases – 44.1 per 100,000)
- LHD: Northern NSW (7% of cases – 91.8 per 100,000)

## Seasonality

Consistent peaks in summer months (Dec-Feb)

## Top serotypes in 2019 (% of all types *Salmonella*) - % change compared to 2018

1. Typhimurium (26%) - ↑1%
2. Enteritidis (11%) - ↑29%
3. Wangata (6%) - ↑11%
4. Paratyphi B Bv Java- (3%) - ↑9%
5. Virchow - (3%) - 0%

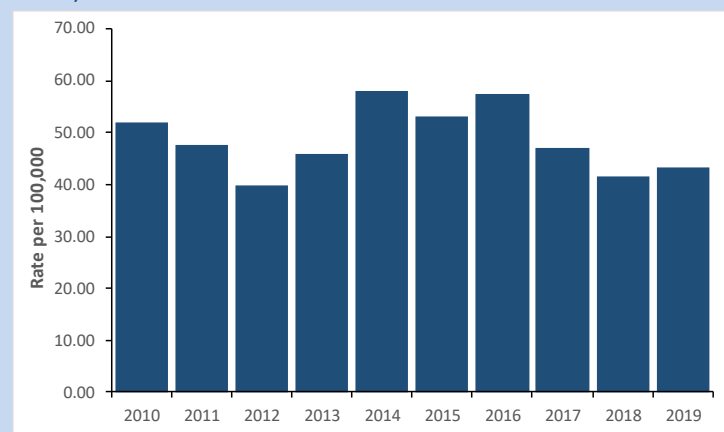
## Outbreaks

Cases found to be associated with a foodborne illness outbreak: 226 (6.4%) (pages 30-39)

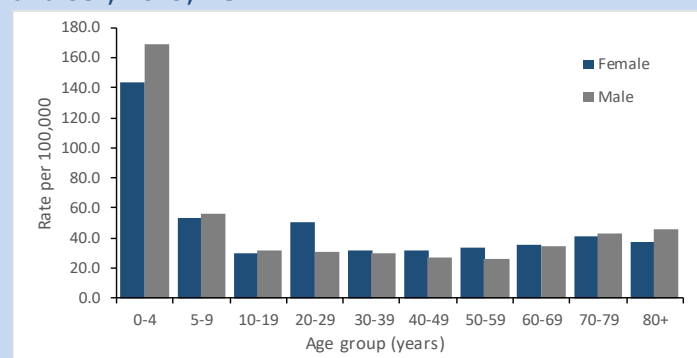
## Deaths

Four deaths related to invasive salmonellosis infection were recorded in 2019, all in adults. Three had known pre-existing medical conditions. Two cases were linked to an outbreak of *S. Typhimurium* MLVA 5-17-9-13-490 (pages 30-39). The other two deaths are not related to each other or any outbreak.

Notification rate per 100,000 population by year, 2010 – 2019, NSW



Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5Yr mean	2019
CC	175.0	148	42.5	52.2
FW	17.4	13	43.2	58.3
HNE	434.2	394	41.8	47.6
IS	183.2	134	32.2	45.2
M	149.2	151	67.6	68.9
MNC	147.8	128	52.6	61.3
NBM	162.0	136	35.3	44.0
NNSW	272.2	270	88.0	91.8
NS	566.0	478	50.6	61.9
SES	517	410	43.3	56.6
SWS	398.4	401	39.3	41.3
SNSW	90.0	71	26.5	35.0
SYD	319.4	255	37.1	48.7
WNSW	101.0	106	37.4	36.1
WS	409.0	413	40.2	43.1
NSW	3941.8	3510	43.5	50.9

\*grey shading – >50% increase compared to 5yr mean

# Salmonellosis continued

## Age group rates

Number and notification rate of salmonellosis in NSW in 2019, compared to the 5 year annual mean, by age group

Age Group	2019			5 year average (2014-2018)		
	Count	% of all cases	Rate	Count	% of all cases	Rate
0-4 yrs	835	24%	157.8	882.0	22%	176.1
5-9 yrs	286	8%	54.4	297.8	8%	59.8
10-19 yrs	294	8%	31.8	365.0	9%	39.7
20-39 yrs	786	22%	35.3	989.6	25%	45.1
40-59 yrs	611	17%	29.9	705.8	18%	35.5
60+ yrs	695	20%	38.5	694.4	18%	42.4

## Salmonella serotypes

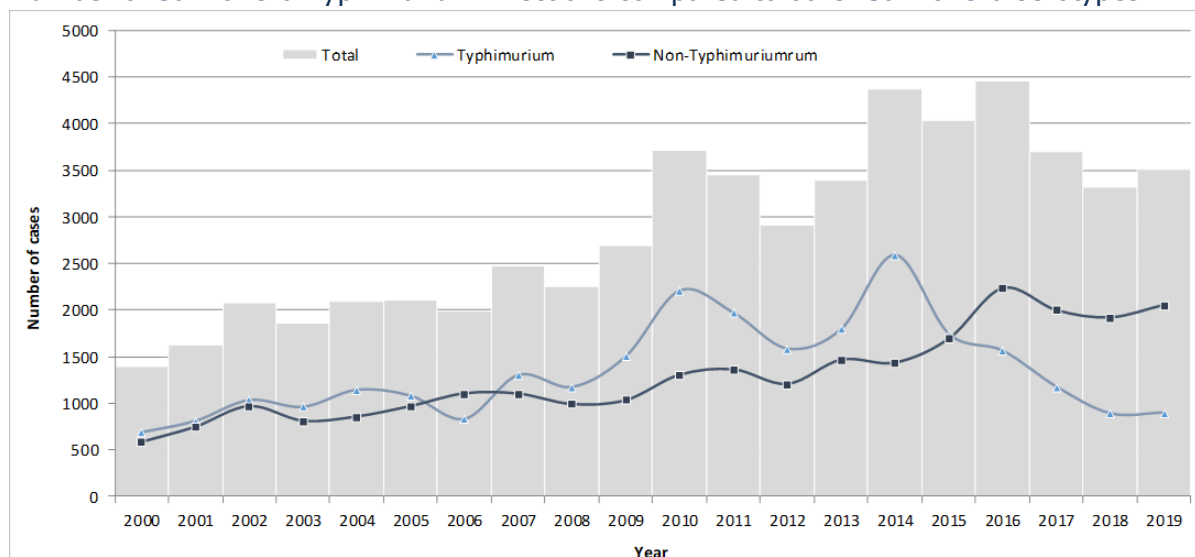
Top 5 *Salmonella* serotypes in NSW, 2015-2019 (number of notifications)

	2015	2016	2017	2018	2019
1	Typhimurium (1747)	Typhimurium (1565)	Typhimurium (1179)	Typhimurium (893)	Typhimurium (901)
2	Enteritidis (155)	Enteritidis (243)	Wangata (201)	Enteritidis (280)	Enteritidis (363)
3	Saintpaul (131)	Virchow (167)	Birkenhead (160)	Wangata (201)	Wangata (223)
4	Paratyphi B bv Java (122)	Saintpaul (142)	Enteritidis (156)	Ser 4,5,12:i:- (137)	Paratyphi B bv Java (120)
5	Wangata (105)	Paratyphi B bv Java (125)	Ser 4,5,12:I (134)	Birkenhead (121)	Virchow (119)

## Salmonella Typhimurium trends

*Salmonella* Typhimurium has been the predominant serotype identified in NSW for several years. In 2019, *Salmonella* Typhimurium notifications increased by 1% when compared to 2018.

Number of *Salmonella* Typhimurium infections compared to other *Salmonella* serotypes in NSW, 2000-2019





# SALMONELLA ENTERITIDIS INFECTION

While *Salmonella* Enteritidis is endemic in commercial poultry farms in most countries, it is not thought to be endemic in Australia. Most NSW cases are acquired overseas. All notified cases of *Salmonella* Enteritidis are investigated in NSW to determine likely place of acquisition (local vs overseas); locally acquired cases are further investigated.

## Summary 2019

- Case count: 363
- Reported hospitalisations: 81
- Reported deaths: 1
- Notification rate per 100,000: 4.5

## Overall trend

76% increase in the 2019 notification rate compared to the 5 year annual mean (2.6 per 100,000)

## Groups with highest notification rate in 2019

Age: <5 years (16% of cases – 10.8 per 100,000)

Sex: Female (52% of cases – 4.6 per 100,000)

LHD: Western Sydney (18% of cases – 6.3 per 100,000)

## Seasonality

Typically October peak, however in 2019 peak occurred in January.

## Place of acquisition in 2019

In NSW: 38%

In Australia & outside NSW: 1%

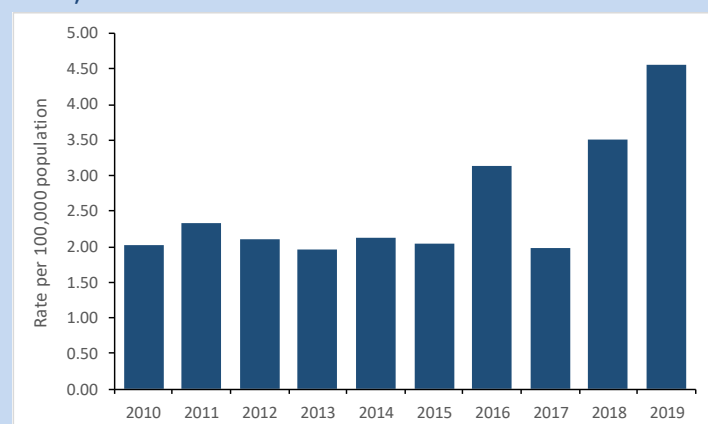
Overseas: 60%

Unknown: 2%

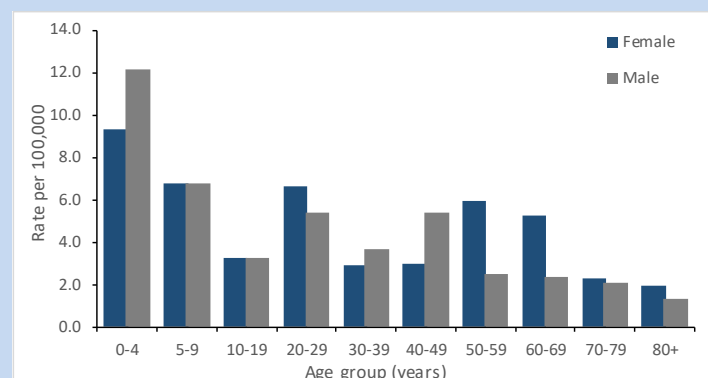
## Outbreaks

An outbreak of locally acquired *S. Enteritidis* linked to eggs occurred in NSW commencing in May 2018, with 107 cases linked to the outbreak in 2019.

Notification rate per 100,000 population by year, 2010 – 2019, NSW



Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	9.0	9	2.7	2.6
FW	0.6	0	2.0	0.0
HNE	19.6	27	2.1	2.9
IS	11.2	15	2.8	3.6
M	7.4	6	3.4	2.7
MNC	5.0	4	2.1	1.6
NBM	6.2	20	1.7	5.2
NNSW	10.4	13	3.5	4.2
NS	33.8	69	3.7	7.3
SES	32.4	57	3.5	6.0
SWS	18.2	34	1.9	3.3
SNSW	4.2	7	1.6	2.6
SYD	18.0	34	2.7	5.0
WNSW	3.4	5	1.2	1.8
WS	18.2	65	1.9	6.3
NSW	197.6	363	2.6	4.5

\*grey shading – >50% increase compared to 5yr mean

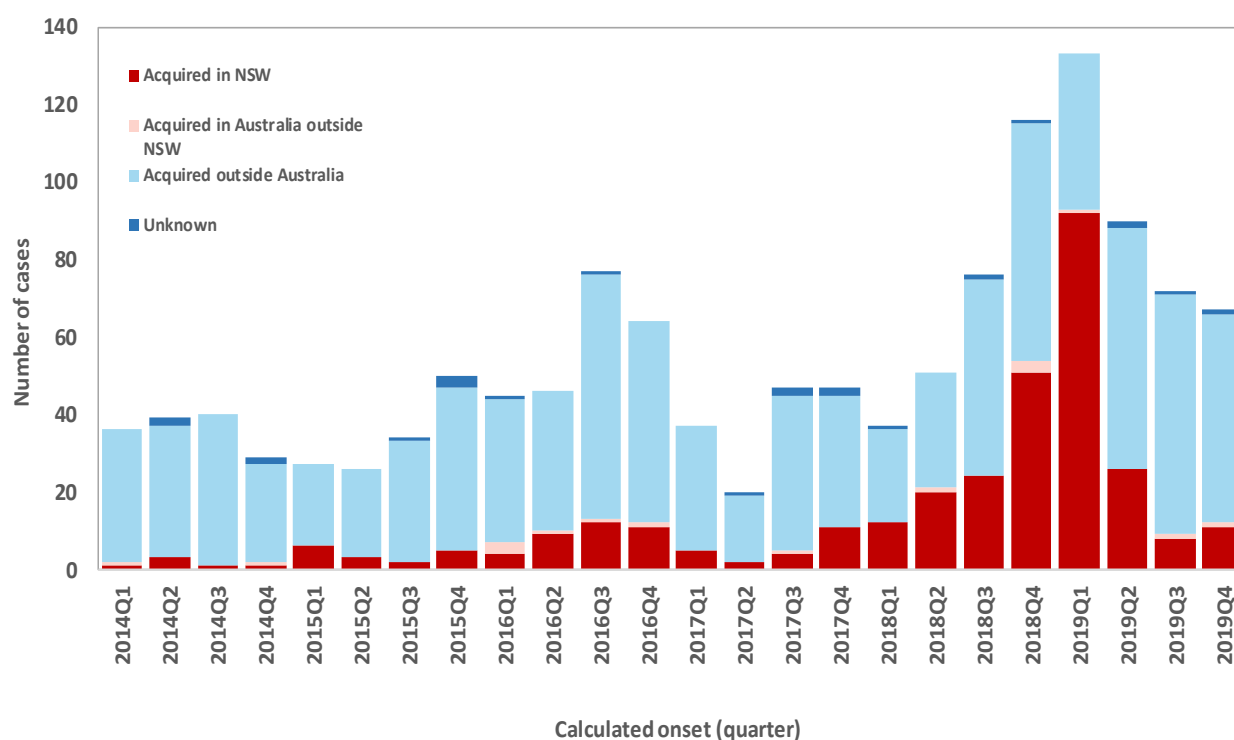
# Salmonella Enteritidis infection continued

## Place of acquisition

Number and rate of *Salmonella* Enteritidis notifications by place of acquisition and year, 2014-2019, NSW

Year	Count		Rate (per 100,000)	
	Acquired in NSW	Acquired outside NSW	Acquired in NSW	Acquired outside NSW
2014	6	134	0.08	1.78
2015	16	117	0.21	1.54
2016	36	191	0.46	2.47
2017	22	124	0.28	1.57
2018	107	170	1.34	2.13
2019	137	221	1.70	2.74

*Salmonella* Enteritidis notifications by quarter and place of acquisition, NSW, 1 Jan 2014 to 31 Dec 2019



# SALMONELLA PARATYPHI BIOVAR JAVA INFECTION

All *Salmonella* Paratyphi biovar Java cases are investigated in NSW because it is known to be associated with novel routes of infection. Cases are commonly associated with exposures such as overseas travel, sandpits (associated with outbreaks on the northern beaches of Sydney), aquariums in the home, and imported seafood (both associated with multi-antibiotic resistant *Salmonella* Paratyphi biovar Java organisms).

## Summary 2019

- Case count: 120
- Reported hospitalisations: 24
- Reported deaths: 0
- Notification rate per 100,000: 1.5

## Place of acquisition in 2019

- In NSW: 35%
- In Australia & outside NSW: 1%
- Overseas 55%
- Unknown: 9%

(based on responses from 82% of cases)

## Overall trend

The notification rate remained stable when compared to the 5 year annual mean (1.5 per 100,000)

## Groups with highest notification rate in 2019

Age: <5 years (29% of cases – 6.6 per 100,000)

Sex: Female (54% of cases – 1.6 per 100,000)

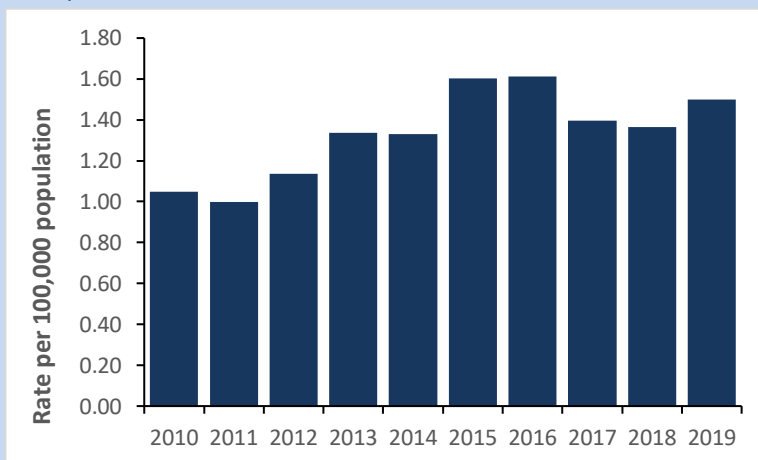
LHD: Northern Sydney (28% of cases – 3.6 per 100,000)

## Outbreaks

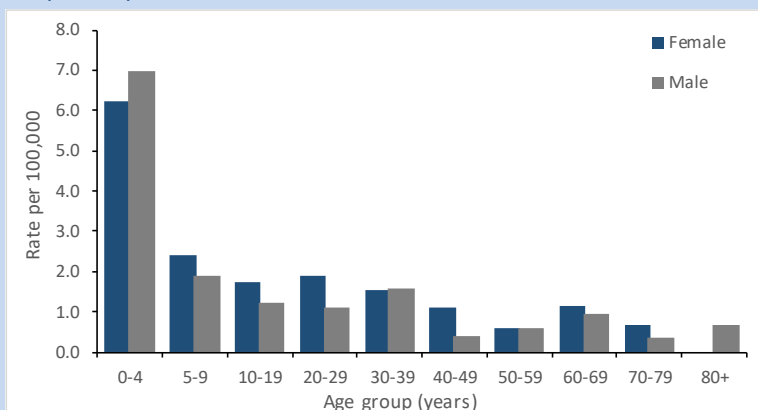
- Cases associated with an outbreak: 0%

**Note:** Although no cases were found to be associated with an outbreak, NSLHD continues to investigate the relationship between *Salmonella* Paratyphi biovar Java infections in preschool children and sandpits contaminated by local native fauna.

Notification rate per 100,000 population by year, 2010 – 2019, NSW



Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	4.6	10	1.4	2.9
FW	0.2	0	0.7	0.0
HNE	8.6	10	0.9	1.1
IS	4.2	4	1.0	1.0
M	0.8	0	0.4	0.0
MNC	1.4	1	0.6	0.4
NBM	5.2	6	1.4	1.6
NNSW	3.2	3	1.1	1.0
NS	47.8	34	5.2	3.6
SES	11	20	1.2	2.1
SWS	7.6	10	0.8	1.0
SNSW	1	0	0.4	0.0
SYD	5.4	8	0.8	1.2
WNSW	1.6	4	0.6	1.4
WS	9.6	10	1.0	1.0
NSW	112.4	120	1.5	1.5

\* grey shading – >50% increase compared to 5yr mean

# TYPHOID & PARATYPHOID FEVER

Typhoid & paratyphoid fever are caused by an infection with bacteria called *Salmonella Typhi* and *Salmonella Paratyphi*. In Australia, most diagnosed infections are acquired overseas by individuals ingesting contaminated food or water while visiting countries where typhoid or paratyphoid is endemic. All notified cases of typhoid and paratyphoid are investigated in NSW.

## Summary 2019

- Case count: 99
- Reported hospitalisations: 76
- Reported deaths: 0
- Notification rate per 100,000: 1.2

## Seasonality

Peaks typically in summer months (Jan-Feb)

## Place of acquisition in 2019

In NSW: 6%

Overseas: 94%

*(based on responses from 100% of cases)*

## Overall trend

36% increase in the 2019 notification rate compared to the 5 year annual mean (0.9 per 100,000)

## Groups with highest notification rate in 2019

Age: 5 - 9 years (25% of cases – 4.8 per 100,000)

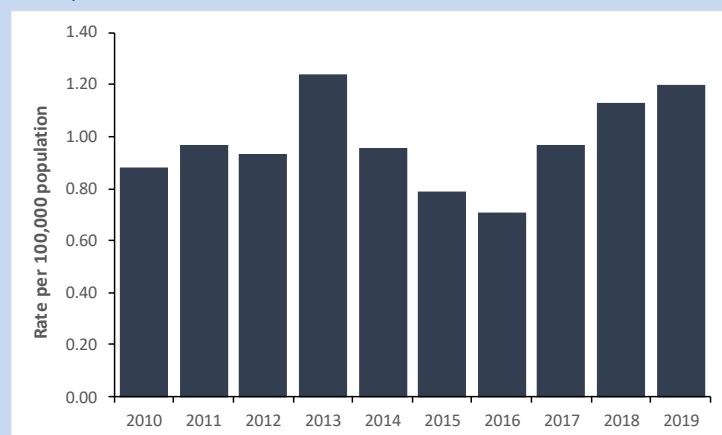
Sex: Male (60% of cases – 1.5 per 100,000)

LHD: Western Sydney (45% of cases – 4.3 per 100,000)

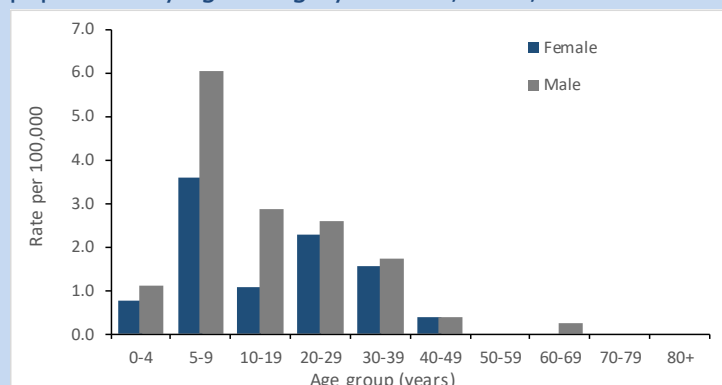
## Outbreaks

There have been no known local typhoid outbreaks in Australia since 1977

Notification rate per 100,000 population by year, 2010 – 2019, NSW



Typhoid and paratyphoid notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	0.8	2	0.2	0.6
FW	0	0	0.0	0.0
HNE	2.2	5	0.2	0.5
IS	1.2	1	0.3	0.2
M	0.4	0	0.2	0.0
MNC	0.4	0	0.2	0.0
NBM	1.6	4	0.4	1.0
NNSW	0.8	0	0.3	0.0
NS	7.2	6	0.8	0.6
SES	9.8	8	1.1	0.8
SWS	8.6	20	0.9	2.0
SNSW	0.4	1	0.2	0.4
SYD	10	8	1.5	1.2
WNSW	0.8	0	0.3	0.0
WS	25.6	44	2.7	4.3
NSW	69.8	99	0.9	1.2

\* grey shading – >50% increase compared to 5yr mean

# SHIGELLOSIS

Shigellosis is a disease caused by infection with *Shigella* bacteria. It causes diarrhoea and is easily spread among people. All cases of shigellosis are investigated in NSW to determine if the infection was acquired overseas or from local sources. *Shigella* can be spread person-to-person or via contaminated food.

## Summary 2019

- Case count: 856
- Confirmed cases: 265, Probable cases: 591
- Reported hospitalisations: 93
- Notification rate per 100,000: 10.60

## Overall trend

184% increase in the 2019 notification rate compared to the 5 year annual mean (3.7 per 100,000).

The change in the national case definition on 1 July 2019, to include probable cases accounts for some of the increase in notifications (page 16).

## Groups with highest notification rate in 2019

Age: 0-4 years (10% of cases – 16.3 per 100,000)

Sex: Male (58% of cases – 12.4 per 100,000)

LHD: Sydney (16% of cases – 20.2 per 100,000)

## Seasonality

No significant trend (highest counts in May and October)

## Place of acquisition in 2019

In NSW: 25%

In Australia & outside NSW: 1%

Overseas: 59%

Unknown: 15%

## Risk exposures reported (locally acquired only)\*

Men who have sex with men (MSM): 50%

Contact with a confirmed/possible case: 8%

Unknown: 42%

## Typing of confirmed cases

Sonnei: 72%

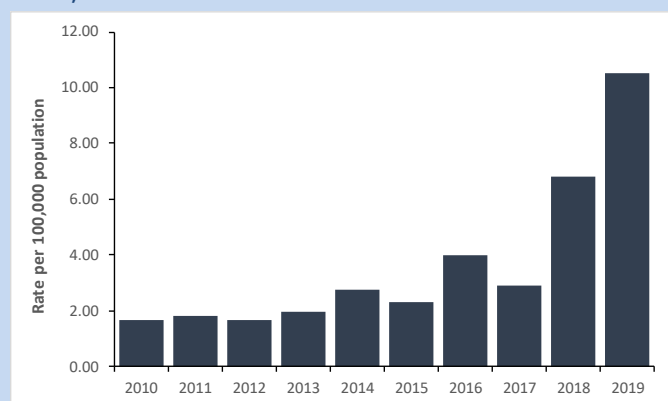
Flexneri: 20%

Boydii: 3%

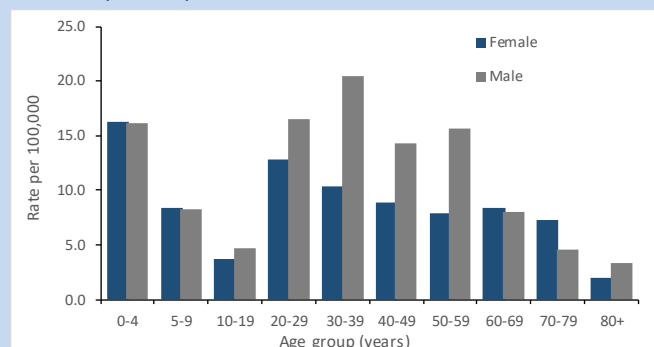
Dysenteriae: 1%

Untyped: 4%

Notification rate per 100,000 population by year, 2010 – 2019, NSW



Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	13	19	3.9	5.5
FW	0.4	1	1.3	3.3
HNE	14.2	46	1.6	4.9
IS	8	21	2.0	5.0
M	3	14	1.4	6.3
MNC	3.4	16	1.4	6.6
NBM	7.6	22	2.1	5.7
NNSW	12.6	50	4.2	16.3
NS	34	143	3.7	15.1
SES	76.8	190	8.4	20.0
SNSW	4.2	10	1.6	3.7
SWS	19.4	66	2.0	6.5
SYD	63.8	139	9.7	20.2
WNSW	3.2	10	1.1	3.5
WS	25.8	109	2.7	10.6
NSW	289.4	856	3.7	10.6

\* grey shading – >50% increase compared to 5yr mean

# Shigellosis continued

## **Emergence of multi-drug resistant *Shigella sonnei* biotype G**

In 2018 a multi-drug resistant (MDR) strain of *Shigella sonnei* biotype G emerged in NSW. Approximately a quarter of *sonnei* G isolates in 2018 were resistant to ciprofloxacin, cotrimoxazole, ampicillin/amoxicillin and azithromycin, which meant that there was no recommended oral antibiotic available for these infections. If a patient with this infection required antibiotic treatment (such as if they present with severe illness), they would need to be referred to hospital for intravenous antibiotics (ceftriaxone or cefotaxime). Whole genome sequencing of the isolates showed they were clonal and fell into one of three genetically related clusters. The vast majority of these MDR *Shigella* organisms were from patients who acquired their infection through male-to-male sexual contact in NSW.

In 2019, 162 (85%) were whole genome sequenced, of which half (80) clustered in the same MDR clusters identified in 2018. Other specimens, with slightly divergent sequencing result also showed the same MDR pattern. In October 2019 a new MDR pattern emerged in a small group of 9 (6%) cases with resistance to ceftriaxone or cefotaxime, cotrimoxazole, ampicillin/amoxicillin and azithromycin, but susceptible to the oral antibiotic ciprofloxacin.

In response to these findings NSW Health convened an expert panel, which advised on clinical guidelines and community messaging. An alert was sent to specialist clinicians, laboratories and hospital emergency departments. NSW community organisations have commenced an awareness campaign for MSM and HIV positive people. The information was shared with state and territory counterparts, and with Therapeutic Guidelines Limited.

NSW Health continues to investigate and respond to notifications of multi-drug resistant *Shigella sonnei* biotype G.

Further information can be found online at <https://www.health.nsw.gov.au/Infectious/alerts/Pages/shigella-drug-resistance.aspx>

# LISTERIOSIS

Listeriosis is an illness usually acquired after eating foods contaminated with the bacterium *Listeria monocytogenes*. Listeriosis is a serious disease in pregnant women and their fetuses, the elderly and people with weakened immune systems. All notified cases of listeriosis are investigated in NSW.

## Summary 2019

- Case count: 17
- Reported hospitalisations: 17
- Reported deaths: 5
- Notification rate per 100,000: 0.2

## Overall trend

32% decrease in the 2019 notification rate compared to the 5 year annual mean (0.3 per 100,000)

## Groups with highest notification rate in 2019

Age: 70-79 and 80+ years (24% of cases each – 1.1 per 100,000)

Sex: Male (53% of cases - 0.2 per 100,000)

LHD: Central Coast (18% of cases – 0.9 per 100,000)

## Deaths

Five deaths occurred in people aged 56-93 years, and from Sydney, South western Sydney and Western NSW regions.

## Place of acquisition in 2019

In NSW: 94%

In Australia & outside NSW: 0%

Overseas: 0%

Unknown: 6%

*(based on responses from 100% of cases)*

## Seasonality

Peak in summer (Dec-Feb)

## Outbreaks

Cases found to be associated with a foodborne illness outbreak: 9 (53%) (pages 30-39)

## Most common comorbidities reported

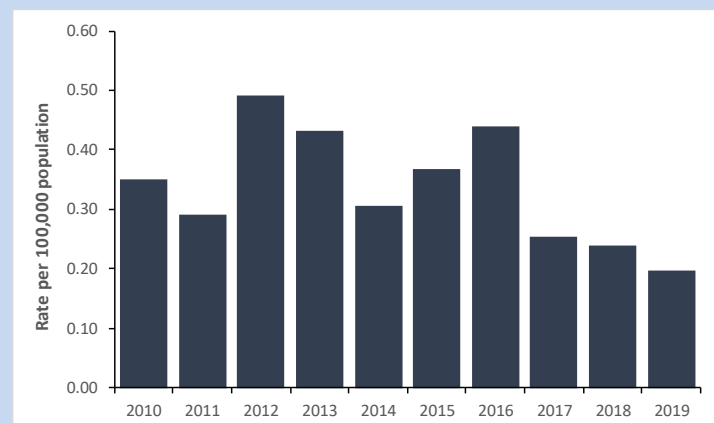
Heart disease: 7

Cancer: 6

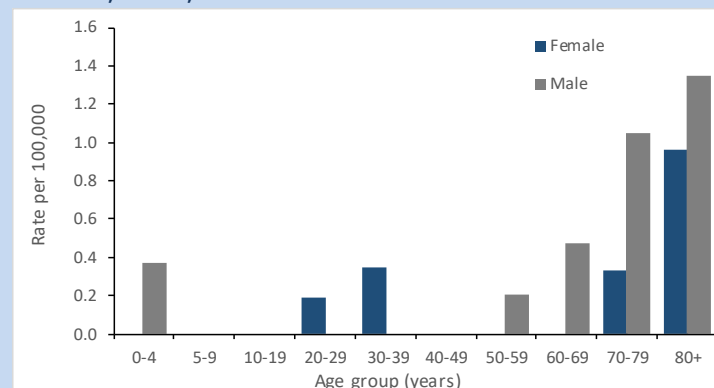
## Perinatal

There were two perinatal cases in 2019

## Notification rate per 100,000 population by year, 2010 – 2019, NSW



## Notification rate per 100,000 population by age category and sex, 2019, NSW



## Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	0.8	3	0.2	0.9
FW	0	0	0.0	0.0
HNE	1.8	2	0.2	0.2
IS	2	0	0.5	0.0
M	0.4	1	0.2	0.4
MNC	0.6	1	0.2	0.4
NBM	0.6	0	0.2	0.0
NNSW	0.6	0	0.2	0.0
NS	4.2	1	0.5	0.1
SES	3.6	2	0.4	0.2
SNSW	1.8	0	0.7	0.0
SWS	3.6	1	0.4	0.1
SYD	2.2	3	0.3	0.4
WNSW	0.6	1	0.2	0.4
WS	1.8	1	0.2	0.1
NSW	24.6	16	0.3	0.2

\* grey shading – >50% increase compared to 5yr mean

# SHIGA TOXIN PRODUCING *E. COLI* INFECTION (STEC)

STEC is a bacterial infection that can cause serious disease, including bloody diarrhoea, and sometimes haemolytic uraemic syndrome (HUS). Infection usually results from consuming contaminated food or water, or from contact with infected animals or people. All notifications of STEC infection are investigated in NSW.

## Summary 2019

- Case count: 78
- Reported hospitalisations: 44
- Reported deaths: 2
- Notification rate per 100,000: 1.0

## Overall trend

61% increase in 2019 notification rate compared to 5 year annual mean (0.6 per 100,000)

The introduction of a more sensitive test and a change in the case definition in 2015 may account for some of the increase in notifications.

## Groups with highest notification rate in 2019

- Age: 80+ years (15% of cases – 3.4 per 100,000)
- Sex: Males (55% of cases – 1.1 per 100,000)
- LHD: Western NSW (23% of cases – 6.3 per 100,000)

## Seasonality

- Peaks in spring and summer months (Oct-Jan)

## Place of acquisition in 2019

- In NSW: 79%
- In Australia & outside NSW: 3%
- Overseas: 8%
- Unknown: 10%

*(based on responses from 100% of cases)*

## Risk exposures reported (locally acquired only)

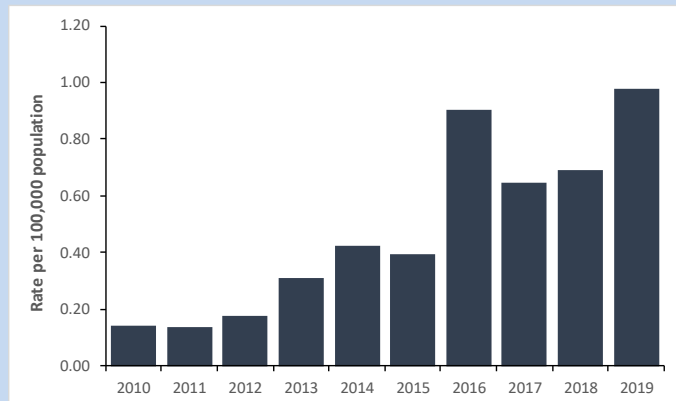
- Ate beef during incubation: 40%
- Any restaurant during incubation: 31%
- Animal contact: 36%
- Farm exposure: 24%

**Note:** Cases may report more than one risk factor

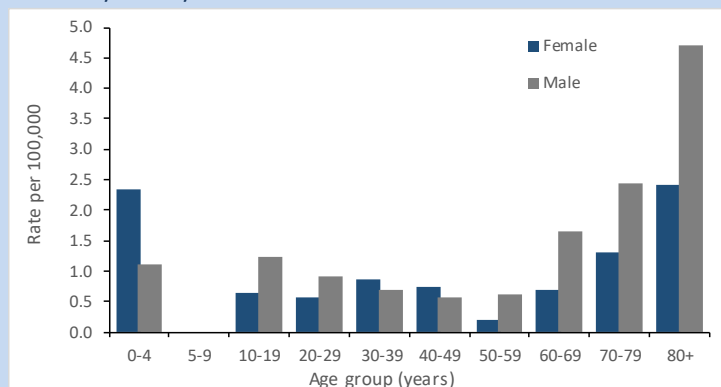
## Deaths

Two deaths occurred in people aged 68-70 yrs, who developed HUS and subsequent multi-organ failure. The infections are believed to have been acquired in NSW.

## Notification rate per 100,000 population by year, 2010 – 2019, NSW



## Notification rate per 100,000 population by age category and sex, 2019, NSW



## Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	1	1	0.3	0.3
FW	0.4	0	1.3	0.0
HNE	7.2	5	0.8	0.5
IS	1.8	0	0.4	0.0
M	6.6	15	2.7	6.2
MNC	0.0	0	0.0	0.0
NBM	0.8	2	0.2	0.5
NNSW	0.6	3	0.2	1.0
NS	0.6	2	0.1	0.2
SES	4.8	3	0.5	0.3
SNSW	6.6	9	2.6	3.4
SWS	0.8	3	0.1	0.3
SYD	0.6	1	0.1	0.1
WNSW	5	18	1.8	6.3
WS	9	15	0.9	1.5
NSW	46.4	78	0.6	1.0

\* grey shading – >50% increase compared to 5yr mean



# HAEMOLYTIC URAEMIC SYNDROME (HUS)

HUS is a clinical syndrome characterized by progressive renal failure that is associated with haemolytic anaemia and thrombocytopenia. In patients with HUS associated with diarrhoea, STEC is the primary cause. All notified cases of HUS are investigated in NSW.

## Summary 2019

- Case count: 5
- Reported hospitalisations: 5
- Reported deaths: 2
- Notification rate per 100,000: 0.1

## Overall trend

- the notification rate in 2019 is similar to 5 year annual mean (0.1 per 100,000)

## Groups with highest notification rate in 2019

- Sex: Female (60% of cases - 0.1 per 100,000)
- Age: 60-69 years (40% of cases – 0.23 per 100,000)
- LHD: Hunter New England (60% of cases – 0.30 per 100,000)

## Seasonality

- Peaks in summer months (Dec-Feb)

## Place of acquisition in 2019

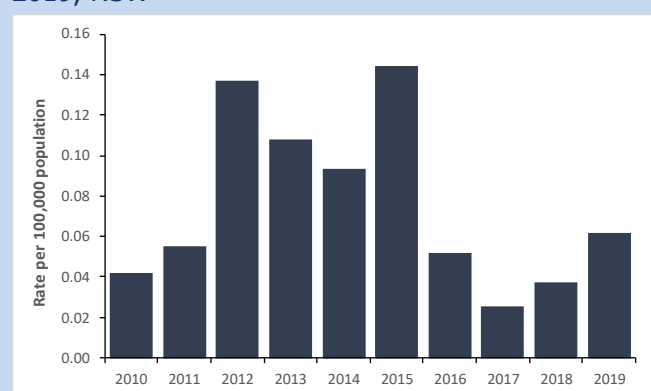
- In NSW: 80%
- In Australia & outside NSW: 0%
- Overseas: 0%
- Unknown: 20%

*(based on responses from 100% of cases)*

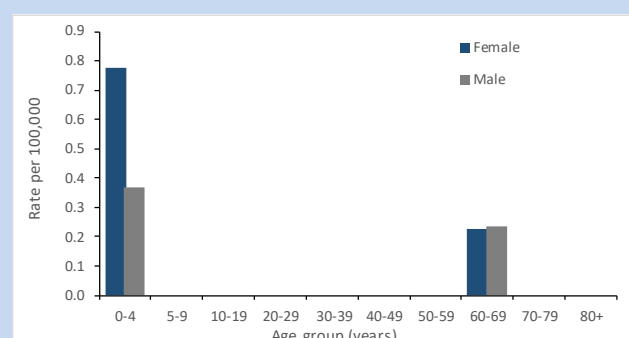
## Bacterial infection

- STEC infections were identified in 3 of the 5 notified HUS cases in 2019 (1=O111:Hnt; 2=serogroup unknown)
- No common source was identified for the three cases, none of which clustered in time by serogroup

Notification rate per 100,000 population by year, 2010 – 2019, NSW



Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	0.2	0	0.1	0.0
FW	0.2	0	0.7	0.0
HNE	1	3	0.1	0.3
IS	0.6	0	0.1	0.0
M	0	0	0.0	0.0
MNC	0	0	0.0	0.0
NBM	0.2	0	0.1	0.0
NNSW	0	0	0.0	0.0
NS	0.8	0	0.1	0.0
SES	0.6	0	0.1	0.0
SNSW	0	1	0.0	0.4
SWS	0.4	1	0.0	0.1
SYD	0.2	0	0.0	0.0
WNSW	0.4	0	0.1	0.0
WS	0.8	0	0.1	0.0
NSW	5.4	5	0.1	0.1

\* grey shading – >50% increase compared to 5yr mean

# CRYPTOSPORIDIOSIS

Cryptosporidiosis is a disease caused by swallowing the *Cryptosporidium* parasite, most commonly in contaminated water. It mainly causes diarrhoea and abdominal cramps. All cases of cryptosporidiosis are investigated in NSW. When an investigation finds multiple cases have attended the same recreational water facility, further investigation and controls may be initiated.

## Summary 2019

- Case count: 667
- Reported hospitalisations: 52
- Reported deaths: 1
- Notification rate per 100,000: 8.3

## Overall trend

- 31% decrease in the 2019 notification rate compared to 5 year annual mean (11.9 per 100,000)
- Increased use of a more sensitive tests may account for some of the increase in notifications in previous years (page 24)

## Groups with highest notification rate in 2019

- Age: <5 years (26% of cases – 33.6 per 100,000)
- Sex: Female (52% of cases – 8.5 per 100,000)
- LHD: Northern Sydney (18% of cases – 12.9 per 100,000)

## Seasonality

- Peaks in summer to autumn months (Dec-Apr)

## Place of acquisition in 2019

- In NSW: 72%
- In Australia & outside NSW: 2%
- Overseas: 20%
- Unknown: 6%

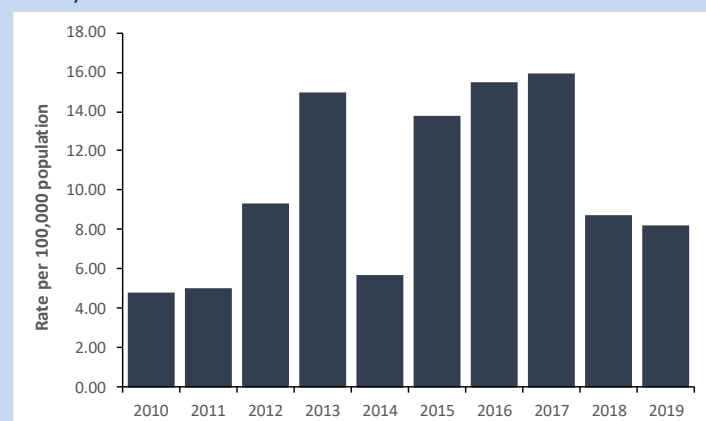
*(based on responses from 70% of cases)*

## Risk exposures reported (locally acquired only)

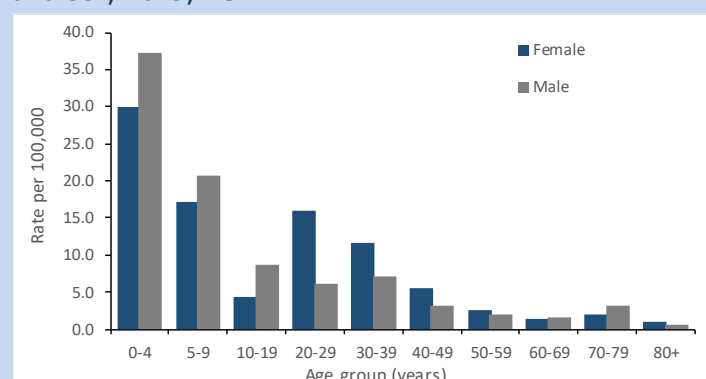
- Public swimming pool: 27%
- Farm animal exposure: 11%
- Tank water: 5%

**Note:** Some cases may report more than one risk factor

Notification rate per 100,000 population by year, 2010 – 2019, NSW



Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	37.2	16	11.1	4.6
FW	0.8	3	2.7	10.0
HNE	131.2	98	14.4	10.4
IS	56.4	50	13.9	12.0
M	39	26	16.2	10.7
MNC	28.6	18	13.2	8.1
NBM	41.6	30	11.3	7.8
NNSW	60.6	25	20.4	8.1
NS	124	122	13.6	12.9
SES	123.2	61	13.5	6.4
SNSW	18	7	7.0	2.6
SWS	63.4	67	6.6	6.6
SYD	64.4	44	9.8	6.4
WNSW	56.2	34	20.1	12.0
WS	78.6	66	8.3	6.4
NSW	923.2	667	11.9	8.3

\* grey shading – >50% increase compared to 5yr mean

# GIARDIASIS

Giardiasis is an infection mainly of the small intestine caused by the parasite *Giardia lamblia*. Giardiasis has been reported in humans and in a variety of animals. Notified cases of giardiasis are not routinely followed up in NSW.

## Summary 2019

- Case count: 3263
- Reported hospitalisations: 1\*
- Reported deaths: 0
- Notification rate per 100,000: 40.4

\*Hospitalisations may be underestimated as most giardiasis cases are not interviewed by public health officers

## Overall trend

- 2% decrease in 2019 notification rate compared to 5 year average (41.1 per 100,000)
- Increased use of more sensitive tests may account for some of the increase in notifications since 2013 (page 27)

## Groups with highest notification rate in 2019

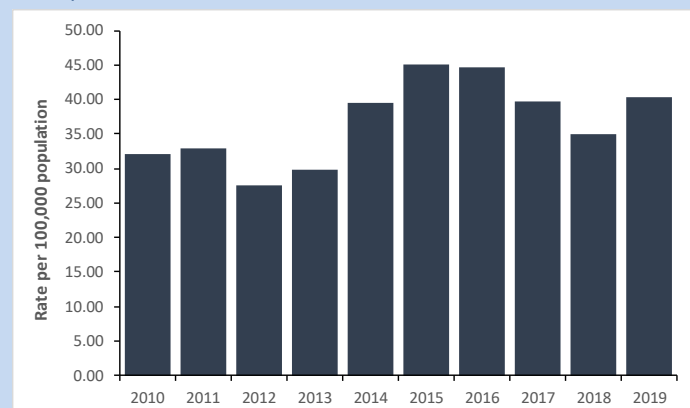
- Age: <5 years (19% of cases – 120.0 per 100,000)
- Sex: Male (53% of cases – 43.5 per 100,000)
- LHD: Northern NSW (7% of cases – 78.9 per 100,000)

## Seasonality

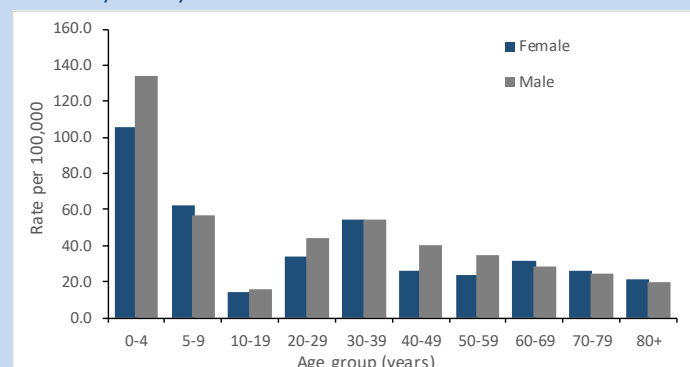
- Peaks in summer to autumn months (Jan-Apr)

**Note:** Risk factor information is not available as cases are not routinely followed up

Notification rate per 100,000 population by year, 2010 – 2019, NSW



Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	133.2	145	39.7	41.6
FW	4.4	16	14.8	53.2
HNE	400.6	348	43.9	36.9
IS	183.2	166	45.2	39.9
M	128.4	129	53.3	53.0
MNC	84	83	38.8	37.2
NBM	133.6	164	36.3	42.6
NNSW	140.8	242	47.5	78.9
NS	511.4	443	55.9	46.9
SES	549	520	60.1	54.9
SNSW	48	24	18.6	9.0
SWS	206.2	269	21.4	26.4
SYD	284	249	43.3	36.3
WNSW	123.2	121	44.1	42.7
WS	247.4	344	26.1	33.5
NSW	3177.8	3263	41.1	40.4

\* grey shading – >50% increase compared to 5yr mean

# HEPATITIS A

Hepatitis A is caused by a viral infection of the liver. The virus is mainly spread by the faecal-oral route, usually by consuming contaminated food or water or by direct contact with an infected person. All notified cases of hepatitis A are investigated in NSW.

## Summary 2019

- Case count: 57
- Reported hospitalisations: 37
- Reported deaths: 0
- Notification rate per 100,000: 0.7

## Overall trend

- 20% decrease in the 2019 notification rate compared to 5 year average (0.9 per 100,000)

## Groups with highest notification rate in 2019

- Age: 20-29 years (34% of cases – 1.9 per 100,000)
- Sex: Male (54% of cases – 0.8 per 100,000)
- LHD: Western Sydney (31% of cases – 1.7 per 100,000)

## Seasonality

- Peaks in summer to autumn (Jan-March)

## Place of acquisition in 2019

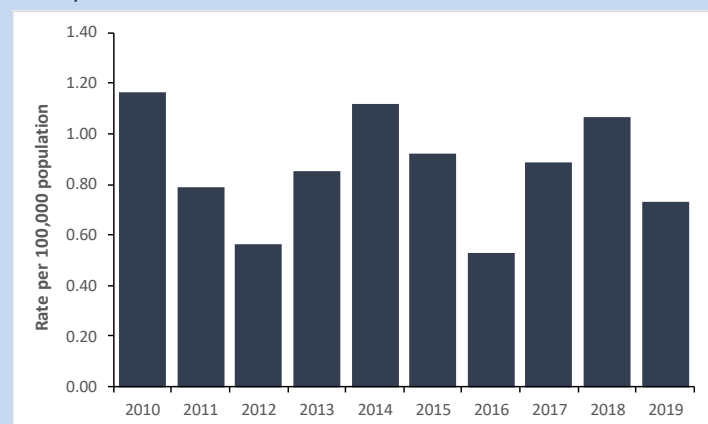
- In NSW: 27%
- In Australia & outside NSW: 0%
- Overseas: 73%
- Unknown: 0%

*(note: data available on 100% of cases)*

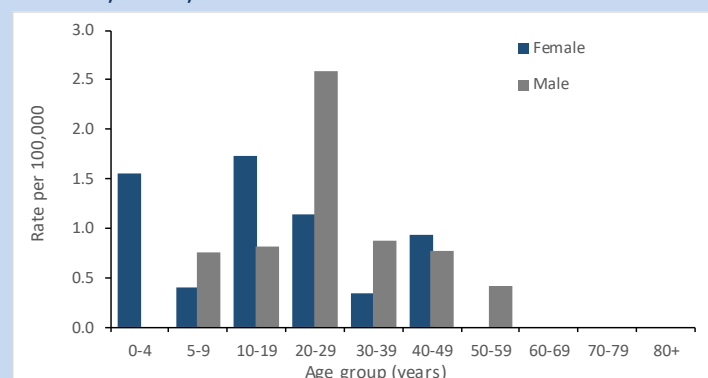
## Outbreaks

- 4 cases were linked to an outbreak where the implicated food was an imported product.

Notification rate per 100,000 population by year, 2010 – 2019, NSW



Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	1.8	0	0.5	0.0
FW	0.4	0	1.3	0.0
HNE	3	2	0.3	0.2
IS	2.4	3	0.6	0.7
M	0.6	2	0.2	0.8
MNC	0.6	0	0.3	0.0
NBM	2	3	0.5	0.8
NNSW	1.2	0	0.4	0.0
NS	6	10	0.7	1.1
SES	10.4	5	1.1	0.5
SNSW	0.2	0	0.1	0.0
SWS	10	7	1.0	0.7
SYD	9.8	6	1.5	0.9
WNSW	1.4	2	0.5	0.7
WS	18.4	17	1.9	1.7
NSW	68.2	57	0.9	0.7

\* grey shading – >50% increase compared to 5yr mean

# HEPATITIS E

Hepatitis E is caused by a viral infection of the liver. The virus is mainly spread by the faecal-oral route, usually by consuming contaminated food or water or by direct contact with an infected person. All cases of hepatitis E are investigated in NSW.

## Summary 2019

- Case count: 24
- Reported hospitalisations: 18
- Reported deaths: 0
- Notification rate per 100,000: 0.29

## Overall trend

- 6% increase in 2019 notification rate compared to 5 year average (0.27 per 100,000)

## Groups with highest notification rate in 2019

- Age: 40-49 years (21% of cases - 0.48 per 100,000)
- Sex: Male (65% of cases – 0.28 per 100,000)
- LHD: South western Sydney (33% of cases - 0.8 per 100,000 respectively)

## Place of acquisition in 2019

- In NSW: 33%
- In Australia & outside NSW: 0%
- Overseas: 67%
- Unknown: 0%

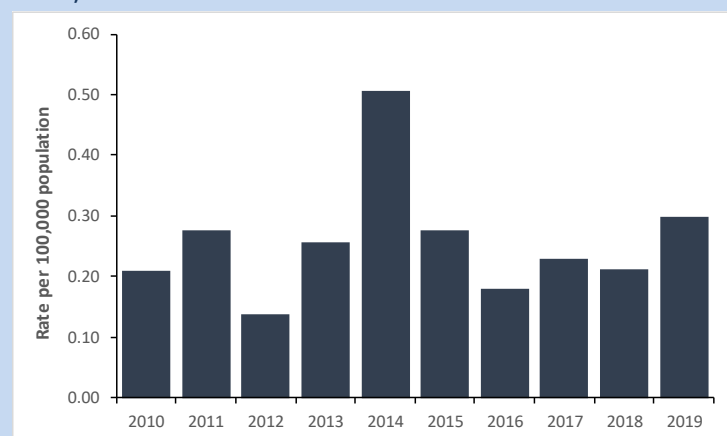
*(note: data available on 100% of cases)*

## Risk exposures reported (locally acquired)\*

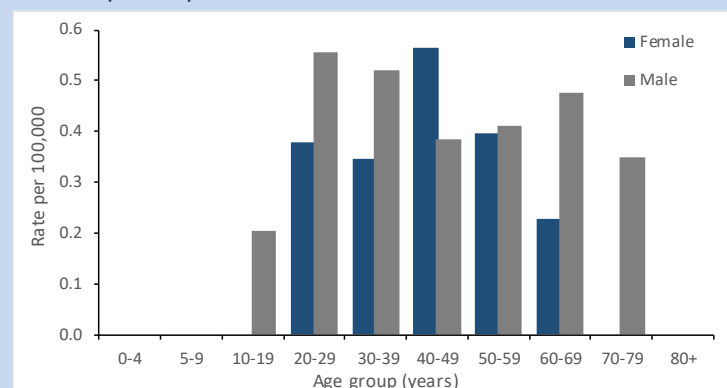
- Pork consumption: 43%
- Shellfish consumption: 29%

\*Note: Food consumption known for five of seven cases.

Notification rate per 100,000 population by year, 2010 – 2019, NSW



Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5yr mean	2019
CC	0.6	0	0.2	0.0
FW	0	0	0.0	0.0
HNE	0.8	0	0.1	0.0
IS	0	1	0.0	0.2
M	0.2	0	0.1	0.0
MNC	0.2	0	0.1	0.0
NBM	0.6	1	0.2	0.3
NNSW	0.2	0	0.1	0.0
NS	4.6	2	0.5	0.2
SES	2.4	0	0.3	0.0
SNSW	0	0	0.0	0.0
SWS	2.6	8	0.3	0.8
SYD	2.8	4	0.4	0.6
WNSW	0	0	0.0	0.0
WS	6	8	0.6	0.8
NSW	21	24	0.3	0.3

\* grey shading – >50% increase compared to 5yr mean

# ROTAVIRUS INFECTION

Rotavirus is a viral infection that causes gastroenteritis. Globally, rotavirus is the most common cause of severe gastroenteritis in early childhood. A vaccine is available and is provided free for children less than 6 months of age in NSW. Single notified cases of rotavirus are not routinely followed up in NSW.

## Summary 2019

- Case count: 1803
- Reported hospitalisations: 54\*
- Reported deaths: 1
- Notification rate per 100,000: 22.3

\*Hospitalisations may be underestimated as not all rotavirus cases are investigated

## Overall trend

- 52% increase in 2019 notification rate compared to 5 year average (14.5 per 100,000)

## Seasonality

- Peaks in spring to summer (Sep-Dec)

## Groups with highest notification rate in 2019

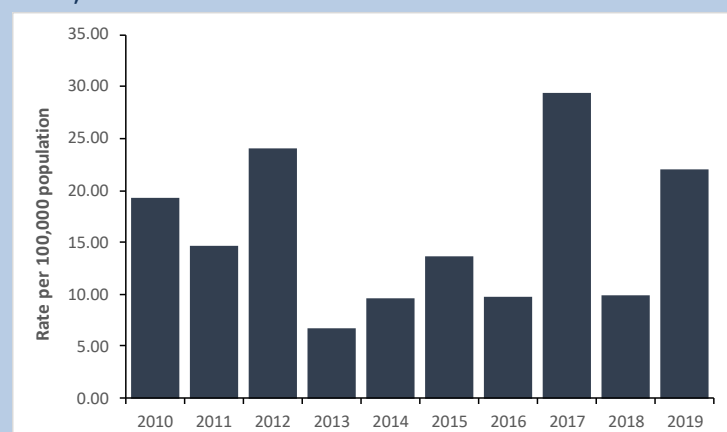
- Age: <5 years (46% of cases – 156.5 per 100,000)
- Sex: Female (50% of cases – 22.1 per 100,000)
- LHD: South Western Sydney (18% of cases – 32.0 per 100,000)

## Outbreaks

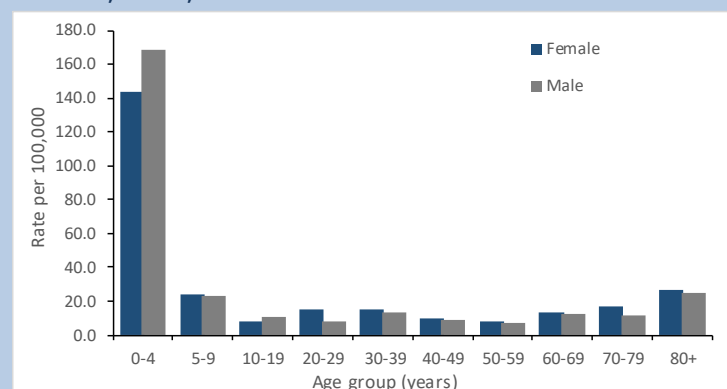
- Cases found to be associated with an institutional outbreak: 47 cases (0.1%) associated with 22 institutional outbreaks

Note: Rotavirus was made notifiable in 2010.

Notification rate per 100,000 population by year, 2012 – 2019, NSW



Notification rate per 100,000 population by age category and sex, 2019, NSW



Number of cases and rates (per 100,000) by Local Health District, 2019, NSW

LHD	Count		Rate	
	5Yr mean	2019	5Yr mean	2019
CC	29.2	51	8.7	14.6
FW	4.4	3	14.8	10.0
HNE	89.2	133	9.8	14.1
IS	26.4	61	6.5	14.7
M	32.8	40	13.6	16.4
MNC	6	15	2.8	6.7
NBM	47	110	12.8	28.6
NNSW	59.4	78	20.0	25.4
NS	172.2	235	18.8	24.9
SES	178.2	199	19.5	21.0
SNSW	13.2	18	5.1	6.7
SWS	143.6	326	14.9	32.0
SYD	110	176	16.8	25.6
WNSW	45.6	81	16.3	28.6
WS	164.6	277	17.4	27.0
NSW	1121.8	1803	14.5	22.3

\* grey shading – >50% increase compared to 5yr mean

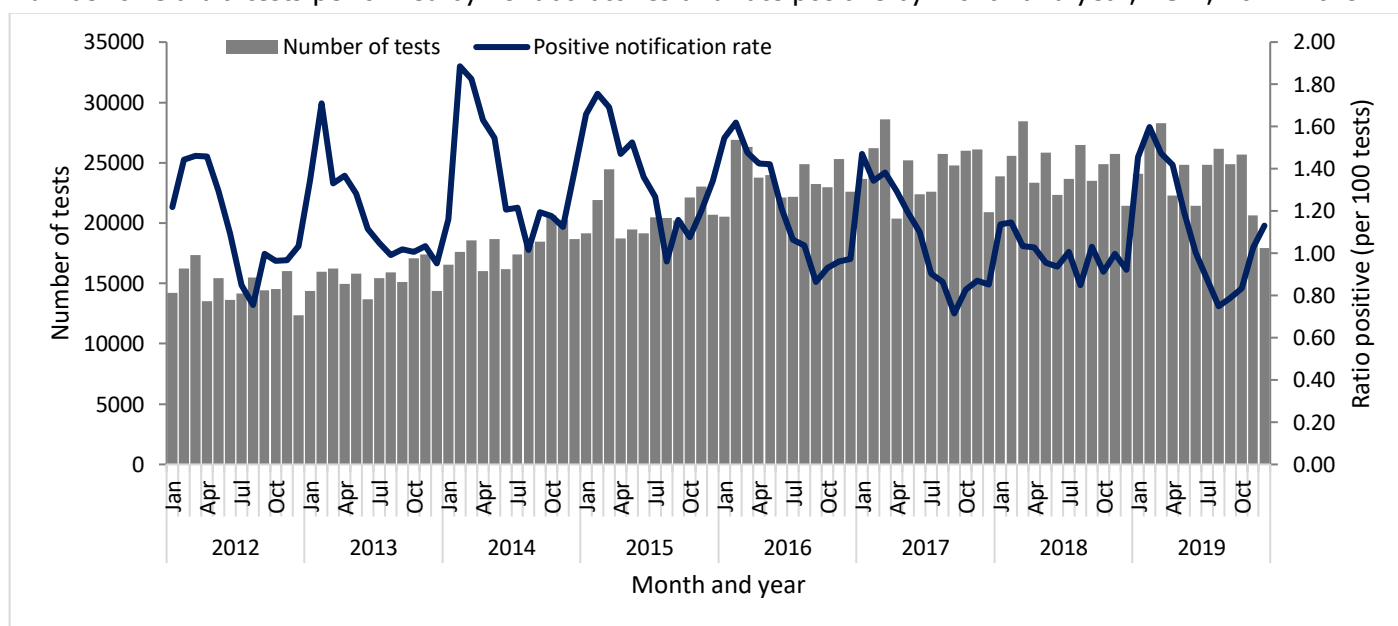
# DENOMINATOR DATA

Laboratory testing data from 14 public and private laboratories was collected for *Cryptosporidium*, *Giardia*, *Salmonella* and *Shigella* from 2012. In January 2014, an additional private laboratory was added. The positive notification ratio is the ratio of positive results to total laboratory tests performed from participating laboratories.

Summary for 2019:

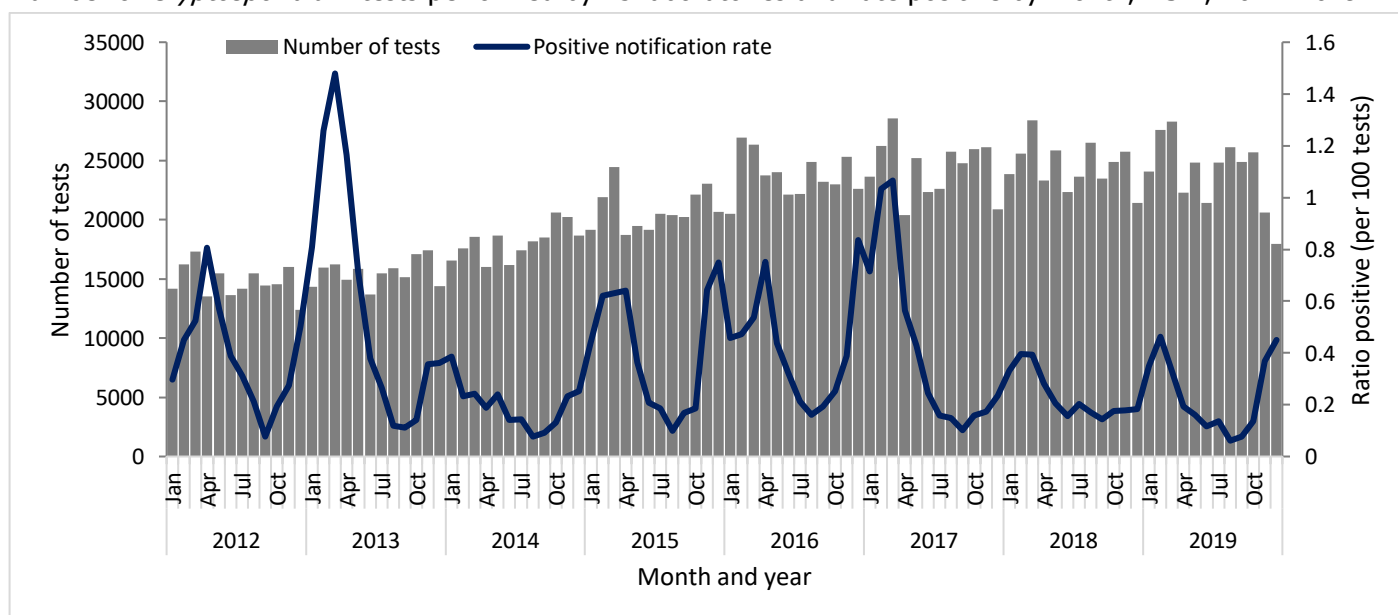
- *Giardia* positive notification rates peaked during late-summer at 1.60 (per 100 tests performed)
- *Cryptosporidium* positive notification rates peaked during late-summer at 0.46 (per 100 tests performed)
- *Salmonella* positive notification rates followed the seasonal pattern, peaking in January at 1.78 (per 100 tests performed)
- *Shigella* positive notification rate was highest in May at 0.39 (per 100 tests performed)

Number of *Giardia* tests performed by 15 laboratories and rate positive by month and year, NSW, 2012–2019\*



\* These 15 laboratories account for approximately 90% of all tests performed in NSW.

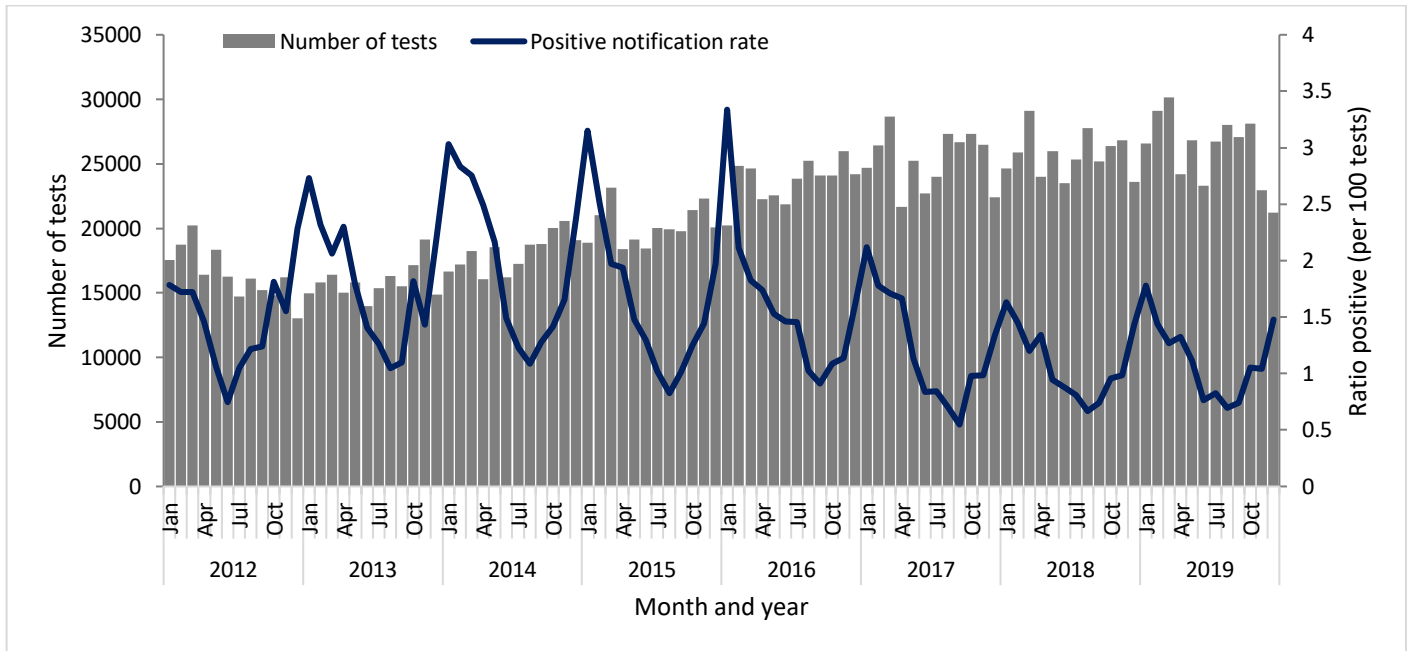
Number of *Cryptosporidium* tests performed by 15 laboratories and rate positive by month, NSW, 2012–2019\*



\* These 15 laboratories account for approximately 90% of all tests performed in NSW.

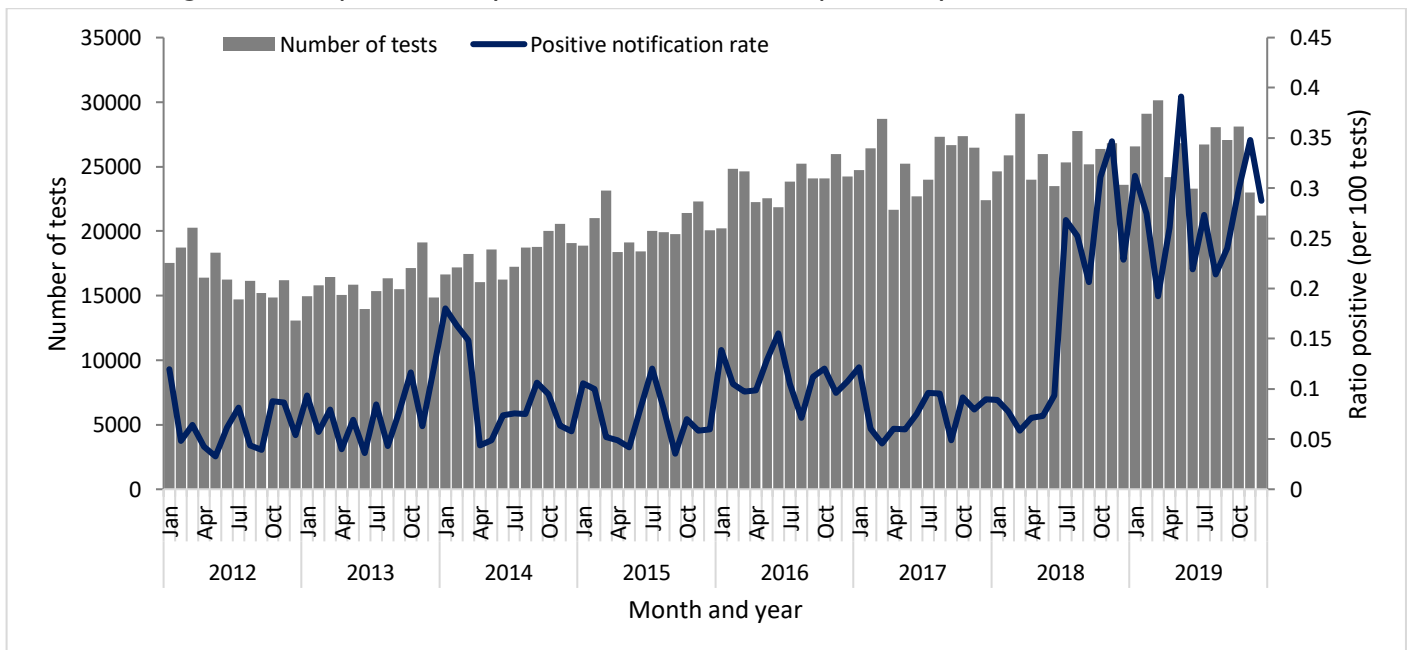
# Denominator data continued

Number of *Salmonella* tests performed by 15 laboratories and rate positive by month, NSW, 2012–2019\*



\* These 15 laboratories account for approximately 90% of all tests performed in NSW.

Number of *Shigella* tests<sup>^</sup> performed by 15 laboratories and rate positive by month, NSW, 2012–2019\*



\* These 15 laboratories account for approximately 90% of all tests performed in NSW.

<sup>^</sup> 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 (PCR).



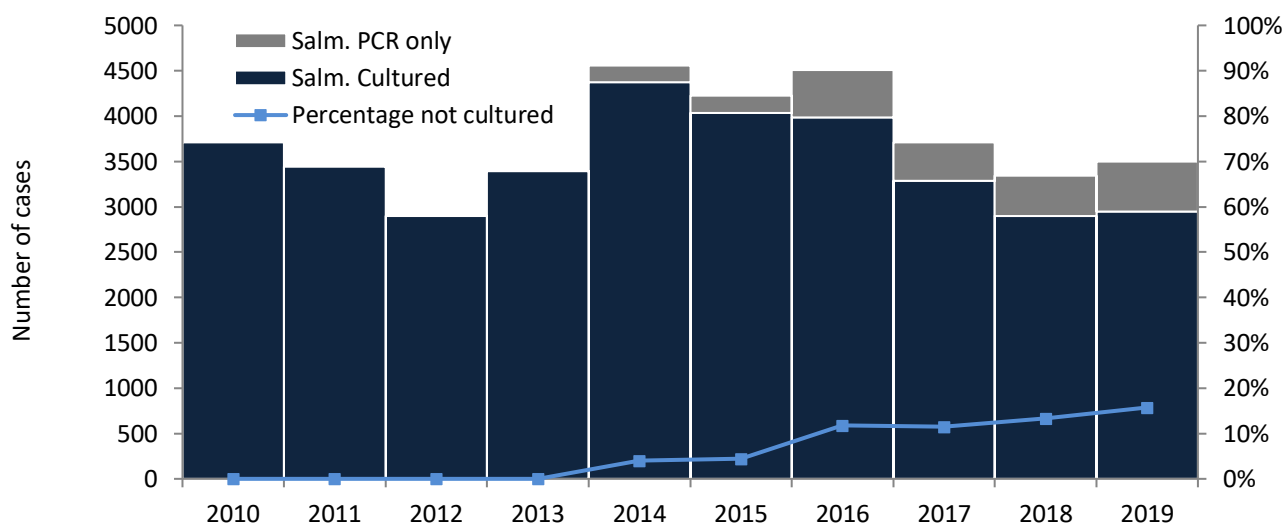
# CULTURE INDEPENDENT TESTING

Culture independent testing (CIDT) does not require isolation and identification of living micro-organisms but works by detecting the presence of specific antigens using polymerase chain reaction (PCR). CIDT was introduced by NSW laboratories in 2014. These tests can be conducted more rapidly and yield results sooner than can be reached through traditional culturing methods. Culture is needed, however, to further characterise the organisms that cause infections.

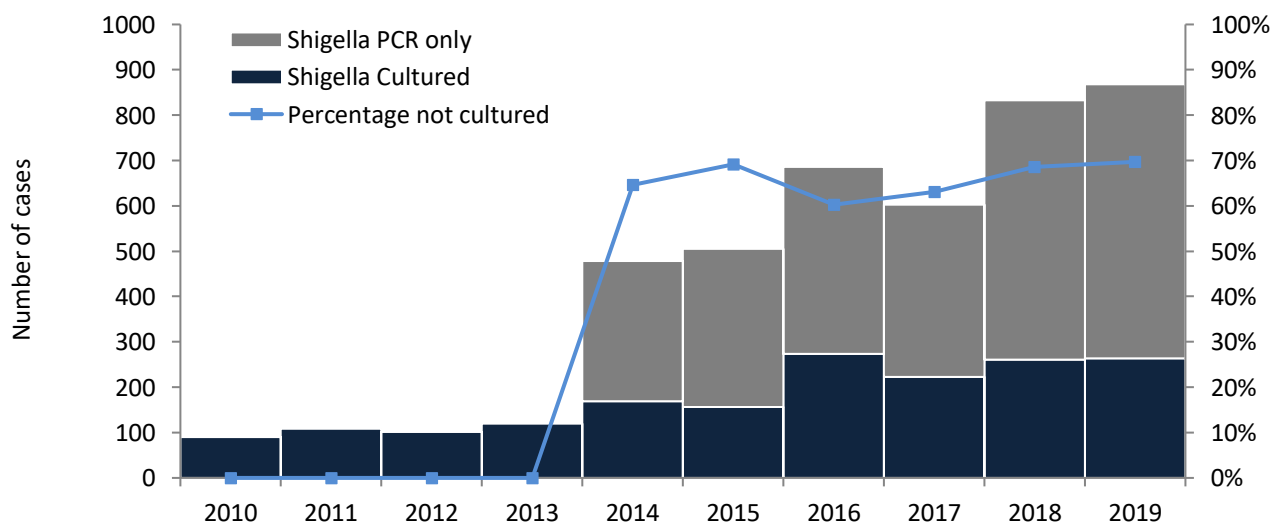
Summary for 2019:

- 16% of *Salmonella* notifications in 2019 were based on diagnosis by PCR methods only.
  - Some laboratories in NSW do not culture *Salmonella* unless it has been requested by the treating doctor.
- 70% of *Shigella* notifications in 2019 could not be cultured or were not cultured.
  - 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).
  - PCR positive *Shigella* samples should be routinely cultured because the antigen target for *Shigella* is also found in enteroinvasive *E. coli*. As such *Shigella* PCR reports that are not culture confirmed are not counted as confirmed cases in NSW.
  - Culture for *Shigella* has a high false negative rate due to the fastidious nature of the organism.

The number of *Salmonella* notifications, by test type, and the percentage PCR only, in NSW, 2010 – 2019



The number of *Shigella* notifications, by test type, and the percentage with only PCR positive result in NSW, 2010 - 2019



# SURVEILLANCE OF FOODBORNE OUTBREAKS

A food-borne disease outbreak may be defined as a situation where two or more people who are linked in time or place report acute onset of enteric or other symptoms caused by ingestion of infectious agents or toxins that may have been acquired by consuming contaminated food or drink. These investigations follow the identification of disease clusters or reports of illness in two or more people who consumed the same food. Investigations are commenced when complaints are received by the NSW Food Authority, or when reported directly to public health units.

## Summary 2019

- Foodborne outbreaks investigated: 53
- Outbreak related cases: 598

## Overall trend

- Similar number of outbreaks compared to 5 year annual mean (52 outbreaks)
- 19% decrease in the number of outbreak-related cases compared to 5 year annual mean (736 people ill)

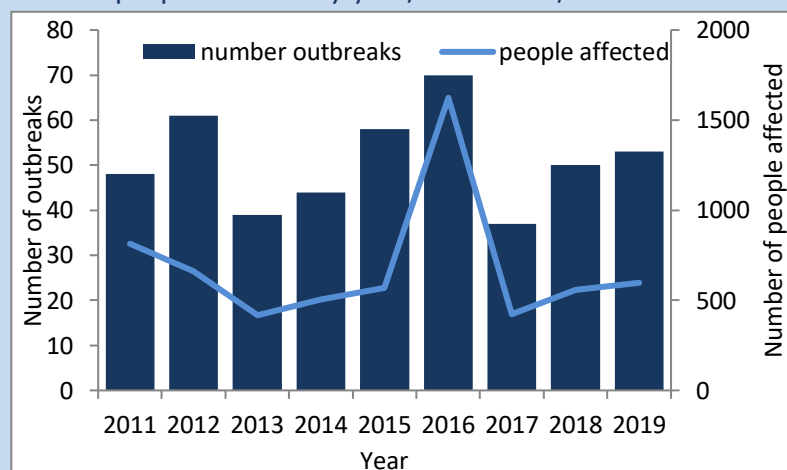
## Top 5 Causative agent in 2019

- *Salmonella*: 47%
- Unknown: 23%
- Fish poisoning: 13%
- Norovirus: 6%
- *Listeria monocytogenes*: 4%

## Contributing factors in 2019

- Unknown: 53%
- Improper food handling/preparation: 19%
- Inadequate cleaning/sanitisation: 15%
- Biotoxins in fish: 13%
- Ingestion of contaminated raw food: 6%

Number of foodborne or suspected foodborne outbreaks and number people affected by year, 2010-2019, NSW



Number of foodborne outbreaks and number of people affected by local health district, 2019, NSW

LHD	2019	No. ill
CC	1	2
HNE	8	62
IS	4	35
M	1	44
MNC	1	3
NBM	1	17
NS	4	35
SES	10	153
SNSW	1	74
SWS	6	37
Syd	2	10
WNSW	1	3
WS	5	28
NSW*	10	153

Foodborne outbreak by causative agent and year, 2014-2019, NSW

Causative agent	2014	2015	2016	2017	2018	2019
Unknown	8	25	34	21	27	12
<i>Salmonella</i> (all serotypes)	26	23	20	5	11	25
<i>Salmonella</i> Typhimurium	26	19	14	4	6	13
Norovirus	1	2	6	3	1	3
<i>Campylobacter</i>	0	2	2	3	1	1
<i>Clostridium perfringens</i>	0	1	0	0	1	0
Fish poisoning	4	4	4	1	7	7
<i>Listeria</i>	1	0	1	0	1	2
Hepatitis E	1	0	0	0	0	1
STEC	1	0	0	0	0	0
Hepatitis A	0	1	0	0	1	1
<i>Shigella</i>	1	0	2	0	0	0
Other	0	0	0	0	0	1
Total outbreaks	44	58	69	37	50	53

\*Outbreaks affecting more than one LHD, counting NSW resident cases only \*\*

# Foodborne outbreaks continued

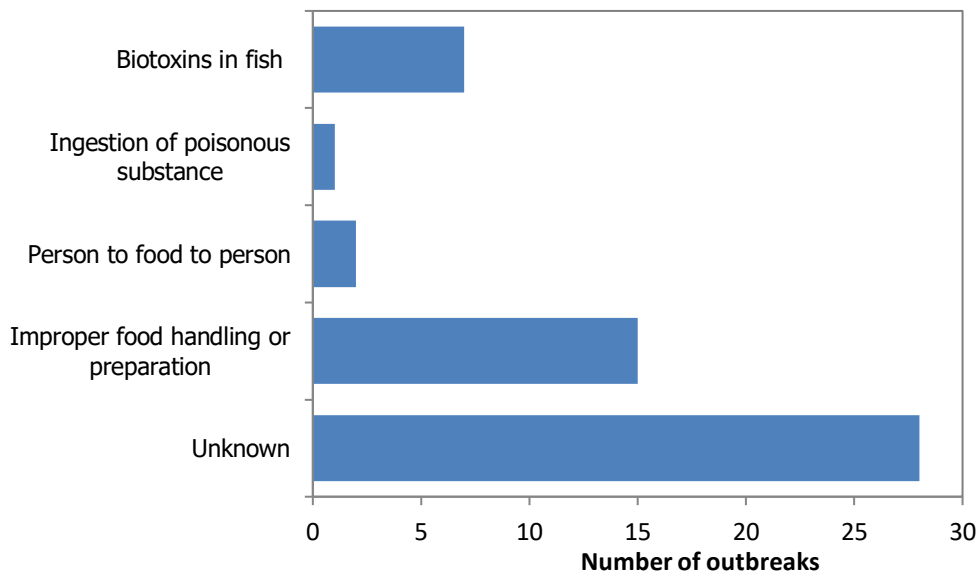
## Description of outbreaks by causative agent

Number of outbreaks, number ill and number hospitalised by causative agent, 2019, NSW

Causative agent/illness	Number of outbreaks	Number ill	Ratio ill per outbreak	Number hospitalised	Ratio hospitalised per outbreak
<i>Salmonella</i> Typhimurium	13	112	8.6	16	1.2
Unknown	12	200	15.6	1	0.1
Other <i>Salmonella</i>	12	117	9.8	30	2.5
Fish Poisoning	7	34	4.8	4	0.6
Norovirus	3	112	37.3	1	0.3
<i>Listeria monocytogenes</i>	2	9	4.5	6	3.0
<i>Campylobacter</i>	1	5	5.0	1	1.0
Hep A	1	4	4.0	4	4.0
Hep E	1	3	3.0	3	3.0
Methemoglobinemia	1	2	2.0	2	2.0
<b>Total</b>	<b>53</b>	<b>598</b>	<b>11.2</b>	<b>68</b>	<b>1.3</b>

## Summary foodborne outbreaks by contributing factors

Foodborne outbreaks by contributing factors\*, 2019, NSW



\* Contributing factors are not mutually exclusive per outbreak

# OUTBREAK SUMMARY 2019

Foodborne and potentially foodborne disease outbreaks investigated in NSW, 2019

PHU ID number	Month of onset	Setting	Pathogen	No. ill	Lab confirmed	No. hospitalised	Evidence*	Suspected / Responsible vehicle	Contributing factors
WS201901	January	Private residence	<i>Salmonella</i> Enteritidis	6	1	1	D	Eggs	Unknown
NS201901	January	Restaurant	<i>Salmonella</i> Enteritidis	14	10	4	D, M	Eggs	Cross contamination/ inadequate sanitising
SES62035	January	Restaurant	<i>Salmonella</i> Enteritidis	21	12	8	A, D, M	Fried ice cream (eggs)	Improper food handling
HNE0526	January	Restaurant	<i>Salmonella</i> Typhimurium (MLVA 5-17-9-13-490)	2	2	1	D	Eggs	Unknown
HNE0527	January	Restaurant	<i>Salmonella</i> Typhimurium (MLVA 5-17-9-13-490)	3	3	2	D	Eggs	Unknown
SWS201901	January	Restaurant	Scombroid	2	0	2	D	Tuna steak	Toxic substance or part of tissue
SWS62124	February	Restaurant	<i>Campylobacter</i>	5	2	1	A, D	Chicken liver pate	Insufficient cooking time or temperature
WS62374	February	Take-away	<i>Salmonella</i> Enteritidis	8	7	5	D	Eggs, Vietnamese rolls	Cross contamination/ inadequate sanitising
SES62248	February	Restaurant	<i>Salmonella</i> Saintpaul	11	6	0	D	Unknown	Inadequate cleaning of equipment
HNE0528	February	Restaurant	<i>Salmonella</i> Typhimurium (MLVA 5-17-9-13-490)	3	2	0	D	Eggs	Unknown
MNC201901	February	Commercial caterer	<i>Salmonella</i> Typhimurium (MLVA 5-17-9-13-490)	3	3	2	D	Eggs	Unknown

\* 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.

^ MJOI201904 = 99 cases nationally, including 25 cases in NSW

^^ MJOI201903 = 5 cases nationally, including 2 cases in NSW

^^^ MJOI201905 = 5 cases nationally, including 2 cases in NSW

PHU ID number	Month of onset	Setting	Pathogen	No. ill	Lab confirmed	No. hospitalised	Evidence*	Suspected / Responsible vehicle	Contributing factors
NSW201901	February	Bakery	<i>Salmonella</i> Typhimurium (MLVA 5-17-9-13-490)	43	24	6	D	Eggs	Inadequate cleaning of equipment
HNE0529	February	Restaurant	Unknown	2	0	0	D	Ham sandwiches	Unknown
SES201902	February	Restaurant	Unknown	5	0	0	D	Unknown	Unknown
SES62299	February	Restaurant	Unknown	9	0	0	D	Unknown	Unknown
CC201902	March	Private residence	Scombroid	2	0	0	D	Tuna steak	Toxic substance or part of tissue
IS62436	March	Take-away	Unknown	13	0	1	D	Unknown	Unknown
NS62767	April	Bakery	<i>Salmonella</i> Typhimurium (MLVA 5-17-9-13-490)	6	6	1	D	Eggs	Inadequate cleaning of equipment
SWS63156	April	Restaurant	<i>Salmonella</i> Typhimurium (MLVA 5-17-9-13-490)	7	6	2	D	Eggs	Inadequate cleaning of equipment
HNE0530	April	Bakery	<i>Salmonella</i> Typhimurium (MLVA 5-17-9-13-490)	3	3	1	D	Eggs	Unknown
IS201901	April	Restaurant	<i>Salmonella</i> Typhimurium	3	3	1	D	Unknown	Unknown
SES201903	April	Restaurant	Unknown	40	0	Unknown	D	Curry or rice	Poor temperature control
SES201905	May	Restaurant	Norovirus	25	2	0	D	Unknown	Unknown
M201901	May	Restaurant	Norovirus	44	4	Unknown	D	Unknown	Improper food handling and cleaning and sanitation issues
SWS201902	May	Bakery	<i>Salmonella</i> Enteritidis	3	3	0	D	Raw egg mayonnaise	Improper food preparation

\* 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.

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PHU ID number	Month of onset	Setting	Pathogen	No. ill	Lab confirmed	No. hospitalised	Evidence*	Suspected / Responsible vehicle	Contributing factors
SES201904	May	Restaurant	Scombroid	2	0	0	D, M	Tuna burger patties	Toxic substance or part of tissue
SES201907	June	Cargo Ship	<i>Salmonella</i> Enteritidis	19	3	0	D	Unknown	Unknown
WS201903	June	Restaurant	Unknown	4	0	0	D	Unknown	Improper food preparation
WS63558	July	Private residence	Ciguatera	5	0	0	D	Redthroat emperor fish	Toxic substance or part of tissue
NSW201902	July	Community	Hepatitis A	4	4	4	A, D	Imported products/ Unknown	Ingestion of contaminated raw products
MJOI201903^^	July	Community	<i>Listeria monocytogenes</i>	2	2	2	A, M, D	Smoked salmon	Unknown
WNSW63653	July	Restaurant	<i>Salmonella</i> Typhimurium	3	3	0	D	Raw egg aioli	Improper food perpetration
SES63681	July	Restaurant	Unknown	9	0	0	D	Unknown	Unknown
IS63586	July	Restaurant	Unknown	15	0	0	A, D	Garden salad	Unknown
NSW201903	August	Community	<i>Salmonella</i> Typhimurium	10	10	0	M	Raw chicken	Unknown
SYD63972	August	Restaurant	Unknown	8	0	0	D	Unknown	Inadequate or failed disinfection
SNSW201901	August	Camp	Unknown	74	0	0	D	Unknown	Unknown
HNE201902	September	Takeaway	Salmonella	4	1	0	D	Unknown	Unknown
SWS201903	September	Private residence	<i>Salmonella</i> Typhimurium	17	7	Unknown	D	Raw egg icing	Ingestion of contaminated raw products
HNE201904	October	Restaurant	Norovirus	43	2	1	D	Person to person	Inadequate or failed disinfection
MJOI201904^	October	Community	Salmonella Weltevreden	25	25	9	A,D,M	Core Powerfoods meals	Unknown

\* 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.

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^^^ MJOI201905 = 5 cases nationally, including 2 cases in NSW

PHU ID number	Month of onset	Setting	Pathogen	No. ill	Lab confirmed	No. hospitalised	Evidence*	Suspected / Responsible vehicle	Contributing factors
WS201902	October	Community	Scombroid	5	5	1	A	Marlin	Toxic substance or part of tissue
IS201902	October	Restaurant	Unknown	4	0	0	D	unknown	Unknown
SWS201904c	November	Community	Hep E	3	3	3	M	unknown	Unknown
NSW201904c	November	Community	<i>Listeria monocytogenes</i>	7	4	4	A,D	Unknown	Unknown
SYD201902	November	Restaurant	Methemoglobinemia	2	0	2	D	Sodium nitrate	Misuse of food processing aid
MJOI201905 <sup>^^^</sup>	November	Community	Salmonella Enteritidis	2	2	2	A,M	Chicken linked by WGS	Unknown
HNE201903	November	Restaurant	Salmonella Wangata	2	1	1	D	unknown	Unknown
NS201903	November	Restaurant	Scombroid	6	0	1	D	Mahi Mahi	Toxic substance or part of tissue
NBM201901	November	Camp	Unknown	17	0	0	D	unknown	Unknown
NSW201905c	December	Community	<i>Salmonella</i> Enteritidis	2	2	0	M	unknown	Unknown
NS201902	December	Restaurant	<i>Salmonella</i> Typhimurium	9	4	0	A,D	Raw egg chocolate mousse	Ingestion of contaminated raw products
SES201908	December	<b>Commercial caterer</b>	Scombroid	12	0	0	D, M	Tuna	Toxic substance or part of tissue

\* 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.

<sup>^</sup> MJOI201904 = 99 cases nationally, including 25 cases in NSW

<sup>^^</sup> MJOI201903 = 5 cases nationally, including 2 cases in NSW

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# SIGNIFICANT ENTERIC OUTBREAKS 2019

## **Update NSW *Salmonella* Enteritidis outbreak linked to local eggs – MJOI201901**

The initial investigation and subsequent recall of eggs relating to an increase in locally acquired *S. Enteritidis* cases in the metropolitan Sydney area was described in the 2018 annual report. Following the egg recall in September 2018, locally acquired *S. Enteritidis* cases with the outbreak strain continued to be detected during the first half of 2019 and the increase remained under active investigation.

Five point source clusters were linked to the outbreak during 2019, with two occurring in restaurants, two in a take-away venues and one at a private residence.

In the first point source cluster, at least 14 people from five unrelated dining groups became unwell after dining at an Asian restaurant in metropolitan Sydney (NS201901). Ten of these were tested and found to have a *S. Enteritidis* infection. Symptoms appeared between 30 December 2018 and 23 January 2019. Food history information varied, and no common food items were identified between the unwell diners. The NSW Food Authority inspected the venue with the local council and identified hygiene and cross-contamination issues at the restaurant. The business was found to not be using adequate sanitiser and voluntarily agreed to close the premises to improve cleaning practices. Four food samples collected during the initial inspection returned positive for *S. Enteritidis*, including raw meat, cooked prawn, canned meat and ham. Findings indicated that poor sanitising and food handling is likely to have contributed to the spread of *S. Enteritidis*. A prohibition order was issued and the business closed until the contamination risk had been addressed.

Trace-back of ingredients supplied to the restaurant led to a NSW Food Authority inspection of the supplying egg farm. This egg producer had two properties which were both subsequently found to be contaminated with *S. Enteritidis*, which was subsequently linked by WGS to the original outbreak. A consumer advisory was issued on 1 February 2019. This egg producer was later found

to have links to the first contaminated farm identified in September 2018.

The second point source outbreak occurred at a different restaurant linked to the same egg farms. At least 21 people from six unrelated dining groups became unwell following dining at a restaurant in metropolitan Sydney (SES62035), of which 12 were confirmed to be *S. Enteritidis*. Symptom onsets occurred between 1 January 2019 and 29 January 2019. A survey was sent to 15 cases to establish any common food exposures. Of the 11 responses received, nine people reported consumption of fried ice cream (82%) and BBQ chicken (82%). The NSW Food Authority inspected the venue and found the restaurant was using raw eggs to make fried ice cream. NSW Food Authority samples of the fried ice cream were positive for *S. Enteritidis*. A prohibition order was served on the business and the venue was closed for two weeks.

In the third point source cluster, eight people from seven unrelated dining groups became unwell after consuming take-away at a venue in metropolitan Sydney (WS62374). Of these, six were confirmed to be *S. Enteritidis*, one *Salmonella* PCR positive only, and one did not submit specimens for testing. Symptom onsets occurred between 15 February 2019 and 21 February 2019. All seven *Salmonella* cases reported consuming Vietnamese rolls, of which five ate pork rolls, one ate a chicken roll, and one ate a roll with unspecified meat. NSW Food Authority conducted an inspection of the venue and found the take-away used eggs supplied by the producer identified in the above outbreaks. The eggs should not have been onsite. The take-away was issued a prohibition order.

In the fourth cluster, three unrelated cases of *Salmonella* Enteritidis were identified as having consumed Vietnamese rolls from the same bakery in metropolitan Sydney. Symptom onsets ranged between 17 and 21 May 2019. All cases consumed either a pork, chicken or salad Vietnamese style roll containing mayonnaise. The NSW Food Authority inspected the venue and found the business was making a raw egg mayonnaise and was not following raw egg handling guidelines. Swabs and



samples collected during the inspection did not return any positives for *Salmonella*. A prohibition order regarding raw egg use was issued. The egg distributor which supplied the eggs to the business was subsequently found to have positive detections of *S. Enteritidis* on site and an [egg recall](#) was issued on 14 June 2019.

Three additional egg recalls occurred in NSW during quarter 2 as a result of NSW DPI and LLS active surveillance of egg farms and grading facilities for *S. Enteritidis*: [Southern Highland Organic Eggs](#) on 6 April 2019, [Steve's Farm Fresh Eggs](#) on 16 April 2019, and [Port Stephens Eggs](#) on 7 May 2019. All of the five properties found to be affected since the start of the outbreak (since September 2018) were found to have links to each other through transfer of materials or people.

There were a total of 245 *Salmonella* infections linked to this outbreak strain of *S. Enteritidis*, including 234 cases confirmed by Whole Genome Sequencing (WGS), six cases positive by *Salmonella* PCR only and five secondary infections. Of these, 190 were residents of NSW. Action taken to address *S. Enteritidis* risk included six egg recalls (five in NSW and one in Victoria), the provision of consumer advisory information (in NSW), and the issuance of biosecurity directions to several egg production properties and grading facilities following detection of *S. Enteritidis*.

In parallel to the above investigations, NSW Department of Primary Industries (DPI) and NSW Local Land Services (LLS) worked with egg farmers to address the risk of *S. Enteritidis* on farm. This included issuing biosecurity directions that limited access to and movement on affected farms as well as depopulation. On 1 August 2019, a Biosecurity Control Order was issued by DPI, placing additional requirements on all egg farms in NSW to prevent further spread of SE across the industry.

### **Update *Salmonella* Typhimurium outbreak with MLVA profile 5-17-9-13-490 linked to an egg farm**

The initial investigation into an outbreak of *Salmonella* Typhimurium with novel MLVA profile 5-17-9-13-490 was described in the 2018 annual report. The outbreak strain continued to be detected during this first half of 2019 and remained under active investigation.

Eight point source clusters linked to the outbreak were identified during the first half of 2019, with four occurring in restaurants, three in a bakery, and one in a commercial catering business serving older people. Five of these point sources were small in size, with only two or three people able to be identified. Regardless, each cluster was investigated by either NSW Food Authority or local council. While no environmental samples were positive for *Salmonella* at any of these food venues, traceback of ingredients did find that eggs in use at the time of these illnesses were supplied by the same egg grading facility.

The sixth point source outbreak in this investigation was significantly larger. At least 43 people from 17 unrelated dining groups became unwell with gastroenteritis symptoms after consuming, amongst other things, cake items purchased at ten retail outlets of the same bakery chain across metropolitan Sydney (NSW201901). Twenty-four people were confirmed to have a *Salmonella* infection, of which 23 were confirmed with *Salmonella* Typhimurium MLVA profile 5-17-9-13-490. One infection was confirmed by PCR and could not be typed. The remaining people reported to be unwell were not tested. Half of the confirmed *Salmonella* cases were male, and were aged between two to 85 years. Onset of symptoms occurred between 3 February and 21 February 2019, with a median incubation period of one day. Eleven people presented to a hospital, and the median illness duration was seven days. A variety of cake items were reported to have been consumed, with many reported to feature a cream element.

A sample (6) of these cases underwent WGS and the infections were found to be related to the earlier outbreak.

The NSW Food Authority investigated the outbreak with the assistance of local councils. The central kitchen of the cake supplier was found to be using large industrial size mixers to mix cake mix (including raw egg ingredients) and/or ready to eat fillings. One potential issue identified on inspection was ineffective sanitation, including dishwashers not reaching adequate temperatures. This was identified as a potential source of contamination. However, swabs and samples collected from the central kitchen did not confirm a link to the

outbreak as *Salmonella* Typhimurium was not detected.

In the seventh point-source cluster, six cases of *S. Typhimurium* MLVA 5-17-9-13-490 became unwell with gastrointestinal illness after consuming items purchased at a bakery chain in metropolitan Sydney during March and April 2019. Half of the cases were male, and ages ranged from 10-74 years of age (median age 19 years). Onset of symptoms occurred between 7 March and 20 April 2019. One case was admitted to hospital. The range of items consumed by cases varied but included custard/fruit tarts, a custard filled chocolate bun and a profiterole cake. Cases reported purchasing the items from five different shop fronts associated with the bakery chain. The NSW Food Authority inspected the central kitchen, and found no raw egg ready to eat product was being made, yet issues were found with sanitisation, cleaning, hygiene and pest control. However, swabs and samples collected from the central kitchen did not confirm a link to the outbreak as *Salmonella* Typhimurium was not detected.

In the eighth point-source cluster, at least seven people from six different dining groups were reported to have become unwell with gastrointestinal illness after consuming meals at a restaurant in metropolitan Sydney in April 2019. Six people were confirmed to have an infection with *S. Typhimurium* MLVA 5-17-9-13-490, and one person was not tested. All of those unwell were female, aged 18-34 years of age (median 24 years). Onset of symptoms from 25 April to 27 April 2019. Two cases were admitted to hospital. One case was identified as both working at the venue and having consumed a meal at the venue, however this person had not worked while symptomatic. Items consumed by cases included: French toast, eggs, avocado on toast, bacon & eggs, and pancakes with chocolate sauce. The NSW Food Authority inspected the venue and found the business did not make or supply ready to eat raw egg products. Swabs and samples collected did not confirm a link to the outbreak as *Salmonella* Typhimurium was not detected, however, the dishwasher on site was not reaching an adequate sanitisation temperature.

There were a total of 233 confirmed cases of this outbreak strain of *S. Typhimurium* with MLVA pattern 5-17-9-13-490 and related MLVA patterns, and two *Salmonella* PCR positive cases linked to this outbreak. Of these, 215 cases were residents of NSW. There have been five deaths during the outbreak (two in the community and three in residents of an Aged Care Facility) in persons who had acquired a *Salmonella* infection.

A common egg supplier was identified during the NSW Food Authority investigation. The NSW Food Authority continued to work with the farm to reduce *Salmonella* transmission risks, including the implementation of significant improvements to cleaning and sanitising of the egg grading and packing area. New flocks introduced to the farm were also vaccinated against *Salmonella* Typhimurium.

Eggs are a healthy and nutritious food; however, this outbreak highlights that eggs need careful handling to keep them safe. Foods containing undercooked eggs and contamination of foods with raw egg during food preparation are the most common source of salmonellosis in NSW. To reduce the risk of *Salmonella* infection from eggs at home, people are advised to follow the NSW Food Authority's [egg safety recommendations](#). Restaurants, cafes, bakeries, caterers and manufacturers that use raw (unpasteurised) egg to make dressings, desserts and sauces are required to follow [Food Safety Guidelines for the Preparation of Raw Egg Products](#) or use alternatives to raw eggs in ready to eat foods. Safer alternatives include commercially produced dressings and sauces, or pasteurised egg products.

### ***Campylobacter* linked to chicken liver pate - SWS62124**

A small cluster of *Campylobacter* in a metropolitan Sydney local health district was investigated by the local public health unit in February 2019. Five people from a group of 16 became unwell after attending a birthday lunch celebration at a restaurant on 26 January 2019. Two of the unwell people tested positive for *Campylobacter*, and one person was hospitalised. Those positive for *Campylobacter* were aged between 60 to 90 years of age.

All five unwell people reported consuming chicken liver pate, along with one person who remained well. Univariate analysis of food histories indicated that the people who consumed the chicken liver pate were 4.8 times more likely to be ill, than those who did not, however this was not statistically significant.

One week after this event, a worker at the restaurant was hospitalised with *Campylobacter* infection. However the investigation by the public health unit and NSW Food Authority found that despite the epi-link, the worker did not have any involvement in the kitchen during the incubation period. It is thought that the worker was most likely exposed to the same food source. Efforts were made to obtain isolates from at least two samples for WGS and phylogenetic analysis. Since only one culture positive isolate was available, the phylogenetic analysis was not able to be completed.

The local council inspected the venue and found that the chicken liver pate was undercooked, and this item was subsequently removed from the menu.

### **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 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 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 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 5.13. 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 local health district was identified in September 2019. It was identified that 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). Six of the seven *Salmonella* cases were male (86%), and the median age was 11 years (range 8-31 years). 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 10 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 trace

backed to the one processing facility, which underwent a review of food safety practices.

This outbreak highlighted the importance of safe handling and appropriate cooking of raw produce 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. All cases were South Korean born residents of NSW. Cases had no recent travel except one who spent approximately 20% of the 50-day 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 year to date in South Korea as at September. Reports indicated possible links with salt clams (jeotgal). The sequence also matched a historical (2016) NSW case who was also a South Korean national who had not travelled outside of NSW in their incubation period.

A Korean specific food questionnaire was developed to capture imported Korea 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.

### **Salmonella Weltevreden outbreak linked to frozen microwave meals – MJOI201904**

During October 2019, a notable increase in *S. Weltevreden* notifications was detected through routine surveillance in NSW and several other Australian states. Interviews of cases quickly identified that a particular brand of frozen microwave meal as the potential source of the outbreak. Whole genome sequencing confirmed that this was unique strain pointing to a point source outbreak.

Between 17 September 2019 and 16 December 2019 a total of 99 *S. Weltevreden* infections were notified nationally that met the confirmed case definition for the outbreak, including 25 from NSW. Seventy-two percent of cases that were interviewed could recall eating one of the frozen microwave meals in question. A consumer level recall of the implicated products was implemented on 19 October 2019.

Samples of the food in retail were collected and tested by multiple state and territory food agencies and were found to contain the same strain of *S. Weltevreden* as the people who had consumed the product. Investigation of ingredients in the meals was conducted but all individual ingredients sampled did not detected *Salmonella*, and the original source of the contamination could not be determined. The maker of the product ceased production and instituted cleaning measures, and additional kill step measures into the preparing of the microwave meals to prevent this from occurring again.

### **Methemoglobinemia linked to consumption of prawns at a restaurant - SYD201902**

Two unrelated women from separate dining groups ate prawn dishes at a restaurant on 12 December 2019 and both developed dizziness, nausea and fainting episodes within 10-15 minutes of consuming their meals. Both women attended their local Emergency Department that afternoon and were diagnosed with Methemoglobinemia. There were reports of a third person who fainted in the restaurant, but their details were not collected to allow further investigation.

The restaurant reported that this dish was served to about 20 patrons over the course of the day. A container of sodium nitrate found onsite, and it was

revealed that kitchen staff were using it as a processing aid in the prawn dish, contrary to the Food Code. The restaurant ceased the practice and was fined.

### ***Salmonella* Typhimurium outbreak associated with raw egg chocolate mousse - NS201902**

A Sydney metropolitan public health unit investigated two complaints of illness following a meal at a restaurant on 6 December 2019. The complaints were from two separate dining groups of 25 people each, eight people in the first and four in the second all developed illness approximately a day later. *Salmonella* Typhimurium was confirmed in two people from each group, whole genome sequencing confirmed both had the same strain of *Salmonella*. The diners ate a variety of dishes, but what was common to all ill people was a chocolate mousse. Upon inspection it was found that the business was using raw eggs in the chocolate mousse. Specimens and swabs were taken at the restaurant, but no *Salmonella* was detected. The outbreak was likely due to the use of a contaminated egg in the raw egg chocolate mousse. If food businesses are to use raw egg, they must take steps to ensure *Salmonella* cannot grow, such as acidification or using a pasteurised product. This business ceased using raw egg to prepare the chocolate mousse.

# INSTITUTIONAL GASTROINTESTINAL OUTBREAKS

Viral gastroenteritis is highly infectious and outbreaks are very common and can be difficult to control. Outbreaks often occur in institutional settings, such as residential care facilities, educational institutions, or health care facilities. Gastroenteritis among two or more people of any age from an institution and linked in time should be notified to the local PHU. This is to ensure that the institution implements appropriate control and prevention strategies.

## Summary 2019

- Number of outbreaks: 1225
- Number of people affected: 15935
- Number of outbreaks with at least one stool sample collected: 345 (28%)

## Overall trend (compared to 5 year average)

- 75% increase in the number of outbreaks
- 52% increase in the number of people affected

## Seasonality

- Childcare centres: Peaked in February and August
- Aged care facilities and hospitals: Peaked in August

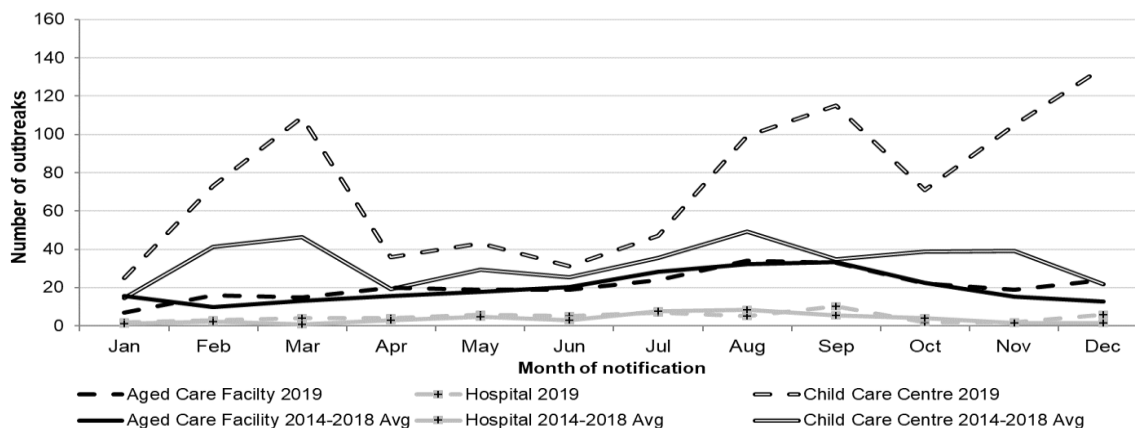
## Groups with highest frequency in 2019

- Facility type: childcare centres, 445 (73%) of outbreaks
- Attack rate in staff: child care at 14%
- Attack rate in non-staff: hospital patients at 37%
- Average duration of outbreaks: schools at 13 days

## Causative agent

- Norovirus (laboratory confirmed): 14% of outbreaks (48% of outbreaks with a stool sample collected)

Number of reported outbreaks of gastrointestinal illness in institutions in 2019 and average of the previous 5 years by month and facility type



Characteristics of outbreaks of gastrointestinal illness in institutions reported to NSW in 2019

Setting	No of Outbreaks (n)	Staff Affected (n: attack rate)	Non-staff affected (n: attack rate)	Avg duration of outbreak (days)	Outbreaks with stool collected (n: %)	Outbreaks with cause found (n: pathogen)
Aged Care	252	1035: 6%	3211: 19%	6	194: 77%	108: norovirus 6: rotavirus
Child care	889	1957: 14%	8530: 13%	8	92: 10%	25: norovirus 14: rotavirus
Hospital	56	208: 11%	426: 37%	6	52: 93%	31: norovirus 2: rotavirus
School	10	49: 10%	362: 11%	13	1: 10%	0
Other*	18	18: 10%	137: 31%	3	6: 33%	2: norovirus
<b>TOTAL</b>	<b>1225</b>	<b>3267: 12%</b>	<b>12666: 16%</b>	<b>8</b>	<b>345: 28%</b>	<b>166: norovirus 22: rotavirus</b>

\*Camps, & other educational or residential care facilities

# 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).

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 developing enteric disease policy. 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.

## 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. In 2015 paratyphoid was separated from *Salmonella* into a separate disease. 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.

## Methods

We analysed data for the following notifiable enteric pathogens; *Salmonella*, *Salmonella* Paratyphi, *Salmonella* Typhi, *Listeria monocytogenes*, *Shigella*, HUS and STEC, *Cryptosporidium*, *Giardia*, *Campylobacter*, rotavirus and hepatitis A & E viruses. There were no cases of botulism or cholera in 2019.

On 30 March 2019, 2018 data was extracted from NCIMS using Secure Analytics for Population Health Research and Intelligence (SAPHaRI)<sup>ii</sup> using the

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<sup>i</sup> We define *Salmonella* as all *Salmonella* serovars, excluding *S. Typhi* and *S. Paratyphi*, in accordance with the definition of *Salmonella* endorsed by the Communicable Diseases Network of Australia (CDNA).

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

## Methods continued

date of onset of disease. The counts of each notifiable enteric disease<sup>iii</sup> for 2019 were compared with the average annual count for the years 2013 to 2017. The NSW estimated resident population for 30 June of each year from 2014-2019 was used to calculate crude incidence rates for each disease.<sup>iv</sup>

Individual factors such as place of acquisition, possible risk exposures, and hospitalisation 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.

Laboratory testing data from 14 public and private laboratories is available for 2012 and 2013 for *Cryptosporidium*, *Giardia*, *Salmonella* and *Shigella*. In January 2014, an additional private laboratory was added. Care should be taken when interpreting trends using data prior to 2014. In addition, there is some duplication of the number of tests undertaken where more than one method of testing is used. Faecal specimens are tested for both *Cryptosporidium* and *Giardia* by nucleic acid amplification test (NAAT). The laboratory testing data does not provide any information on whether

there are repeat tests performed on the same individual.

Notification data for *Campylobacter*, *Cryptosporidium*, *Giardia*, *Salmonella* and *Shigella* were analysed for the period between 1 January 2013 and 31 December 2019, based on the specimen date. The ratio of positive notifications was calculated by dividing the overall positive results notified to NSW Health by all laboratories, by the total number of tests performed as reported from the participating laboratories. The overall positive results included in the analysis are for individual people notified with each condition reported from all laboratories. However, the testing data are for individual tests reported from participating laboratories and may include multiple specimens per individual. As such, the ratio of positive notifications per test may be an underestimate of the per cent of people tested that are positive for the condition.

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 Health Protection NSW.

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<sup>iii</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

<sup>iv</sup> Australian Bureau of Statistics. Estimated resident populations based on 2011 Census counts and mid-series experimental population projections.



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The NSW OzFoodNet Annual Report 2019 was possible due to the collaborative work of many people, some mentioned by name here, who contribute in varying capacities to the management of communicable enteric diseases in NSW:

- NSW Public Health Unit staff for surveillance, reporting and investigation of enteric disease cases, clusters and outbreaks
- HAPS, ICPMR, IMVS, MDU and other public and private laboratory staff in New South Wales, Queensland, Victoria and South Australia
- Enteric diseases and OzFoodNet team, Communicable Diseases Branch, Health Protection, NSW
- Hunter New England OzFoodNet team and Dr Tony Merritt, Dr Craig Dalton and Dr David Durrheim, Hunter New England Local Health District
- Dr Vicky Sheppard, Director, Communicable Diseases Branch
- Dr Jeremy McAnulty, Director, Health Protection, NSW
- Clinicians across NSW who assist in the diagnosis and follow up enteric disease
- The New South Wales Food Authority for management of environmental aspects of outbreak investigations
- Local Councils in NSW that contribute to enteric disease investigations
- Sheena Adamson, Laboratory Liaison Officer and Daneeta Hennessy, WGS Epidemiologist with Health Protection, NSW
- All OzFoodNet epidemiologists and collaborators
- Partners in NSW Department of Primary Industries and associated stakeholders