

OzFoodNet

Enhancing Foodborne Disease Surveillance Across Australia

NSW ANNUAL REPORT

2017



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GLOSSARY

LHD	Local Health Districts	SES	South Eastern Sydney LHD
CC	Central Coast LHD	SNSW	Southern NSW LHD
FW	Far West LHD	SWS	South Western Sydney LHD
HNE	Hunter New England LHD	SYD	Sydney LHD
IS	Illawarra Shoalhaven LHD	WNSW	Western NSW LHD
M	Murrumbidgee LHD	WS	Western Sydney LHD
MNC	Mid North Coast LHD	NSW	New South Wales
NBM	Nepean Blue Mountains LHD	NSWFA	NSW Food Authority
NNSW	Northern NSW LHD	ICPMR	Institute of Clinical Pathology and Medical Research
NS	Northern Sydney LHD	Yr	Year

SUMMARY – ENTERIC INFECTIONS IN NSW

This report summarises NSW enteric disease surveillance data for viral, bacterial and parasitic pathogens for 2017, changes in notifications over time, and other activities in 2017. 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 2017

- Notifications of enteric conditions: 16,885
- Reported hospitalisations: 727
- Reported deaths: 6
- Notification rate per 100,000 population: 214.43

Notified incidence and reported hospitalisation due to enteric pathogens in NSW, 2017

	5Yr annual mean	N 2017	% change	Notified Rate	Reported Hospitalisation ^a
Campylobacteriosis ^b	n/a	6020	n/a	76.45	3
Salmonellosis	3835	3708	-3%	47.09	217
Giardiasis	2815	3124	11%	39.67	8
Cryptosporidiosis	894	1249	40%	15.86	67
Rotavirus	956	2314	142%	29.39	200
Shigellosis	192	230	20%	2.92	63
STEC	34	51	52%	0.65	24
Hepatitis A	60	70	17%	0.89	36
Typhoid	45	55	23%	0.70	51
Listeriosis	31	20	-35%	0.25	19
Paratyphoid	25	21	-15%	0.27	20
Hepatitis E	20	18	-12%	0.23	15
Haemolytic uremic syndrome	8	2	-75%	0.03	2
Botulism	1	1	0%	0.01	1
Cholera	1	2	100%	0.03	1
TOTAL	n/a	16885	n/a	214.43	727

^a Hospitalisations may be underestimated as counts are limited to those infections investigated by a public health unit

^b The number of campylobacteriosis cases reported in 2017 is for the partial year. Notification data prior to April 2017 is not available.

Notable changes in 2017 (compared to 5 year annual average, 2012-2016)

- Campylobacteriosis became a notifiable condition in NSW on 7 April 2017. Campylobacteriosis notifications exceeded all other enteric infections for this year.
- 3% decrease in the number of salmonellosis notifications (pages 6-12)
- 52% increase in Shiga toxinogenic *Escherichia coli* (STEC) and 75% decrease in haemolytic uraemic syndrome (HUS) notifications (pages 19-20)
- 34% increase in cryptosporidiosis notifications, although a similar number to 2014 and 2016 (page 21)
- Increase in notifications of enteric diseases was partially driven by the use of a more sensitive test.

Reported enteric disease outbreaks

- 38 foodborne or potentially foodborne disease outbreaks were reported affecting at least 437 people; a 46% decrease in the number of reported foodborne or probable foodborne disease outbreaks compared to 2016 (n=70)
- 921 viral or probable viral gastroenteritis outbreaks in institutions were reported, affecting at least 14,183 people; a 45% increase in the number of reported gastroenteritis outbreaks in institutions compared to 2016 (n=788)

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 2017

- Case count: 6020
- Reported hospitalisations: 3*
- Reported deaths: 0
- Notification rate per 100,000: 76.45

*Hospitalisations may be underestimated as most campylobacteriosis cases are not investigated

Overall trend

- Campylobacteriosis became a notifiable condition on 7 April 2017. Nevertheless notifications exceeded all other enteric diseases in 2017
- High notification rates were recorded in both urban and rural LHDs (North Sydney = 99.7 per 100,000; Murrumbidgee = 101.6 per 100,000).

Groups with highest notification rate in 2017

- Age: 0-4 years (10% of cases – 117.8 per 100,000)
- Sex: Male (55% of cases – 84.7 per 100,000)
- LHD: North Sydney (15% of cases – 99.7 per 100,000)

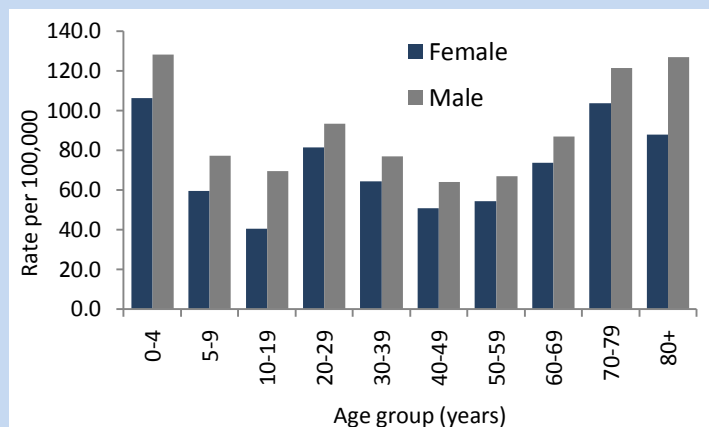
Seasonality

- Campylobacteriosis notifications were highest in the month of November 2017 (n=936)

Outbreaks

- Cases found to be associated with an outbreak: 29 (0.5%) (pages 29-38)

Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	n/a	197	n/a	57.0
FW	n/a	11	n/a	35.9
HNE	n/a	720	n/a	77.4
IS	n/a	241	n/a	59.0
M	n/a	246	n/a	101.6
MNC	n/a	170	n/a	76.5
NBM	n/a	252	n/a	65.5
NNSW	n/a	280	n/a	91.4
NS	n/a	913	n/a	99.7
SES	n/a	810	n/a	87.3
SNSW	n/a	142	n/a	66.3
SWS	n/a	640	n/a	64.6
SYD	n/a	591	n/a	90.3
WNSW	n/a	180	n/a	64.4
WS	n/a	627	n/a	64.6
NSW	n/a	6020	n/a	76.4

* 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; sometimes after close contact with another person with salmonellosis. Notified cases are usually only investigated if they are part of, or suspected to be part of, an outbreak.

Summary 2017

- Case count: 3708
- Reported hospitalisations: 217*
- Reported deaths: 1
- Notification rate per 100,000: 47.1

*Hospitalisations may be underestimated as not all *Salmonella* cases are investigated

Overall trend

- 8% decrease in the 2017 notification rate compared to 5 year annual mean (51.0 per 100,000)

Groups with highest notification rate in 2017

- Age: <5 years (23% of cases – 161.2 per 100,000)
- Sex: Male (50% of cases – 47.2 per 100,000)
- LHD: NNSW (9% of cases - 105.4 per 100,000)

Seasonality

- Consistent peaks in summer months (Jan-Mar)

Top serotypes in 2017 (% of all types salmonella) - % change compared to 2016

1. Typhimurium (38%) - ↓ 25%
2. Wangata (6%) - ↑ 89%
3. Birkenhead (5%) - ↑ 77%
4. Enteritidis (5%) - ↓ 36%
5. ser 4,5,12:i:- (4%) - ↑ 36%

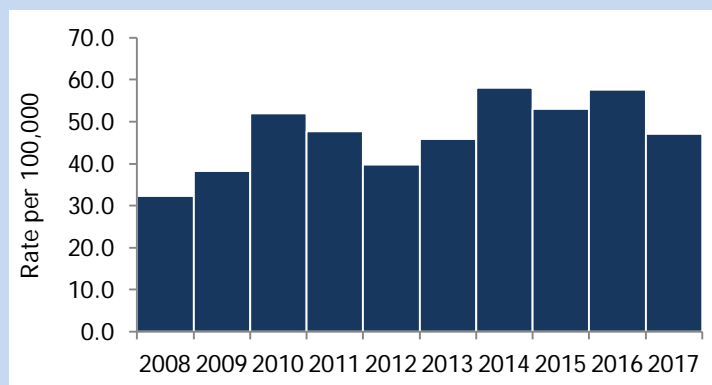
Outbreaks

- Cases found to be associated with an outbreak: 71 (2%) (pages 29-38)

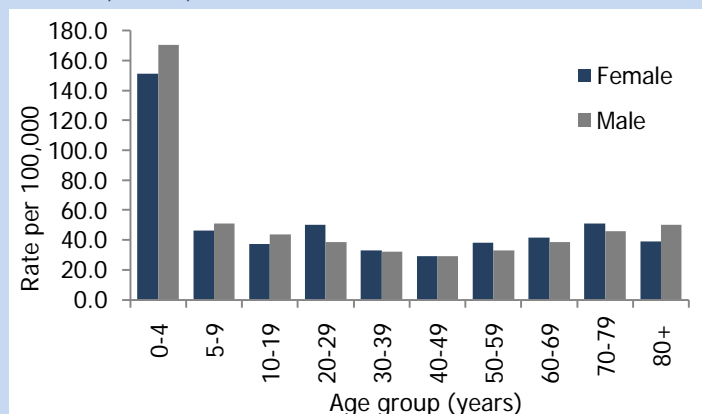
Deaths

A 4 month old female from the Sydney region was found to have *Salmonella* Typhimurium infection on post mortem, but had no clinical symptoms. The infection is thought to be an incidental finding.

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

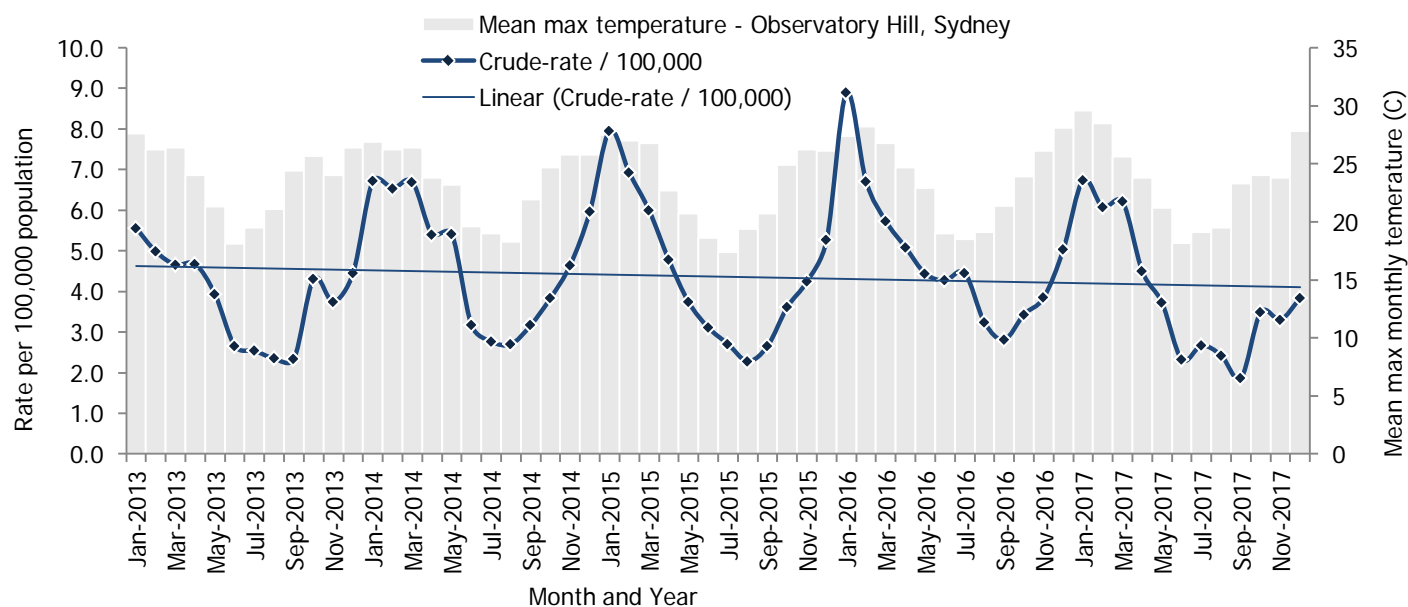
LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	155	221	46.7	64.0
FW	19.6	22	63.3	71.8
HNE	422	404	46.7	43.5
IS	182.2	195	45.9	47.7
M	137.4	165	57.2	68.1
MNC	142	172	66.8	77.4
NBM	159.2	147	43.9	38.2
NNSW	243.2	323	82.5	105.4
NS	565.2	457	63.3	49.9
SES	511.8	416	57.8	44.8
SNSW	90.4	92	44.6	43.0
SWS	384.2	357	41.4	36.1
SYD	324	276	52.5	42.2
WNSW	102.2	104	36.9	37.2
WS	395	357	43.4	36.8
NSW	3834.8	3708	50.9	47.1

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

Salmonellosis continued

Seasonality and temperature effects

Crude monthly salmonellosis notification rate per 100,000 population and mean maximum monthly temperature* in NSW, 2013 – 2017



*Bureau of Meteorology, mean maximum monthly temperatures taken from Observatory Hill in Sydney

Age group rates

Number and notification rate of salmonellosis in NSW in 2017, compared to the 5 year annual mean, by age group

Age Group	2017			5 year average (2012-2016)		
	Count	% of all cases	Rate	Count	% of all cases	Rate
0-4 yrs	855	23%	161.2	843.6	22%	173.4
5-9 yrs	241	7%	48.7	313.6	8%	67.5
10-19 yrs	380	10%	41.0	377.6	10%	41.4
20-39 yrs	826	22%	38.1	1010	26%	49.0
40-59 yrs	655	18%	32.2	660.6	17%	33.7
60+ yrs	749	20%	43.5	626.8	16%	41.0

Salmonella serotypes

Top 5 *Salmonella* serotypes in NSW, 2013-2017 (number of notifications)

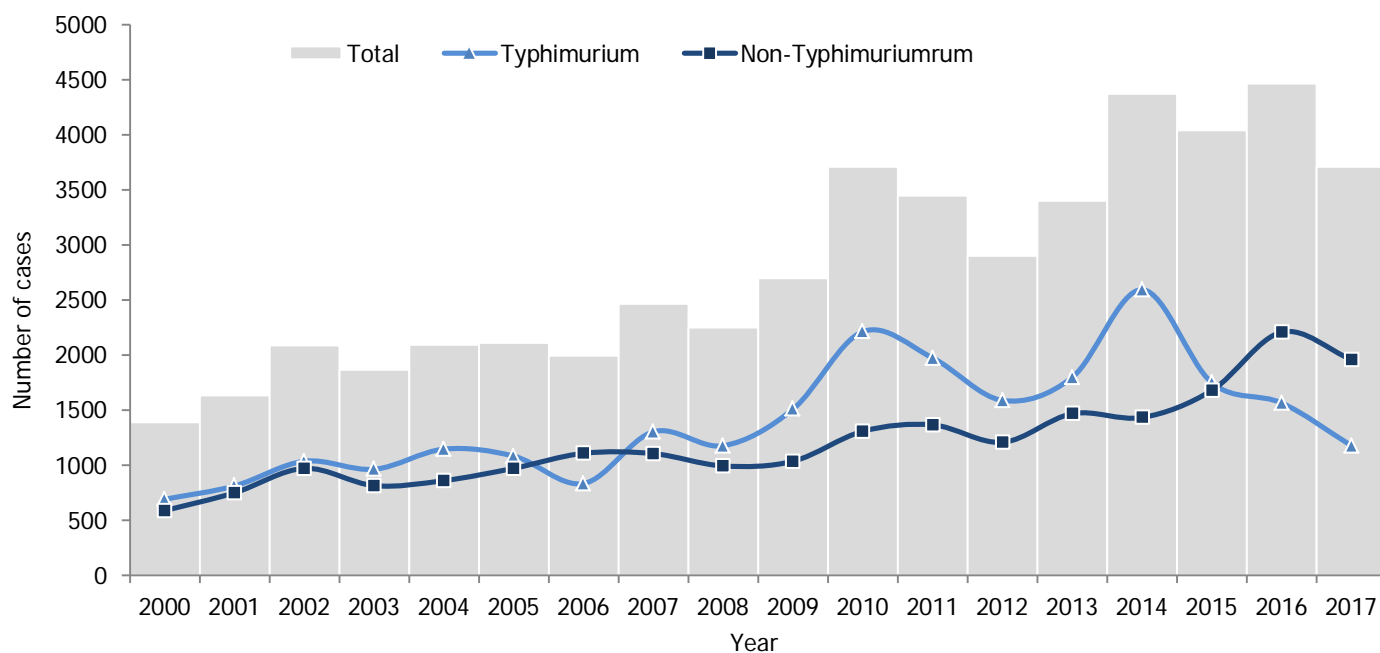
	2013	2014	2015	2016	2017
1	Typhimurium (1798)	Typhimurium (2592)	Typhimurium (1747)	Typhimurium (1563)	Typhimurium (1175)
2	Enteritidis (147)	Enteritidis (159)	Enteritidis (155)	Enteritidis (243)	Wangata (197)
3	Virchow (116)	Virchow (122)	Saintpaul (131)	Virchow (166)	Enteritidis (156)
4	Paratyphi B bv Java (99)	Paratyphi B bv Java (100)	Paratyphi B bv Java (122)	Saintpaul (141)	Birkenhead (156)
5	Birkenhead (76)	Wangata (92)	Wangata (105)	Paratyphi B bv Java (125)	ser 4,5,12:i:- (133)

Salmonellosis continued

Salmonella Typhimurium trends

In 2017, *Salmonella* Typhimurium notifications decreased by 25% when compared to 2016. The NSW Food Authority Foodborne Illness Reduction Strategy has a focus on reducing *Salmonella* Typhimurium and may account for some of the decrease since 2014.

Number of *Salmonella* Typhimurium infections compared to other *Salmonella* serotypes in NSW, 2000-2017



Salmonella Typhimurium MLVA profiles

MLVA (multiple locus variable number of tandem repeats analysis) is a method used by microbiologists to generate a DNA fingerprint of bacteria, and is used in NSW to distinguish different strains of *Salmonella* Typhimurium.

Top 10 *Salmonella* Typhimurium MLVA profiles, 2013-2017, NSW

	2013	2014	2015	2016	2017
1	3-17-9-12-523 (159)	3-17-9-11-523 (210)	3-12-11-14-523 (100)	3-26-13-8-523 (202)	3-17-9-11-523 (43)
2	3-9-8-13-523 (83)	3-12-11-14-523 (149)	3-17-9-11-523 (92)	3-25-18-12-523 (56)	3-12-13-9-523 (40)
3	3-9-7-13-523 (74)	3-12-12-9-523 (141)	3-12-12-9-523 (82)	3-12-12-9-523 (49)	3-16-9-7-523 (39)
4	3-10-14-12-496 (61)	3-10-7-12-523 (99)	3-12-13-9-523 (56)	3-12-11-14-523 (46)	3-17-9-12-523 (34)
5	3-10-7-14-523 (55)	3-9-7-12-523 (98)	3-24-13-10-523 (53)	3-10-14-11-496 (44)	3-16-9-11-523 (32)
6	3-13-11-9-523 (48)	3-9-8-12-523 (97)	3-10-8-12-523 (42)	3-9-7-12-523 (39)	3-9-7-14-523 (31)
7	3-9-7-14-523 (45)	3-16-9-11-523 (94)	3-9-7-12-523 (41)	3-24-13-10-523 (36)	3-12-12-9-523 (27)
8	3-23-23-11-523 (43)	3-17-10-11-523 (94)	3-17-8-11-523 (39)	3-17-9-11-523 (30)	3-9-7-12-523 (27)
9	3-10-8-9-523 (39)	3-10-13-11-496 (52)	3-16-9-11-523 (37)	3-10-15-11-496 (27)	3-12-12-10-523 (25)
10	3-17-9-11-523 (39)	3-16-9-12-523 (50)	3-24-14-10-523 (33)	3-9-12-11-496 (23)	3-10-7-12-523 (22)

*colour code indicates closely related MLVA patterns

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 cases of *Salmonella* Enteritidis are investigated in NSW to determine likely place of acquisition (local vs overseas); locally acquired notified cases are further investigated.

Summary 2017

- Case count: 156
- Reported hospitalisations: 29
- Reported deaths: 0
- Notification rate per 100,000: 1.98

Overall trend

- 13% decrease in 2017 notification rate compared to 5 year annual mean (2.28 per 100,000) (page 10)

Groups with highest notification rate in 2017

- Age: 80+ years (8% of cases – 3.5 per 100,000)
- Sex: Male (51% of cases – 2.0 per 100,000)
- LHD: Murrumbidgee (6% of cases - 4.1 per 100,000)

Seasonality

- October peak

Place of acquisition in 2017

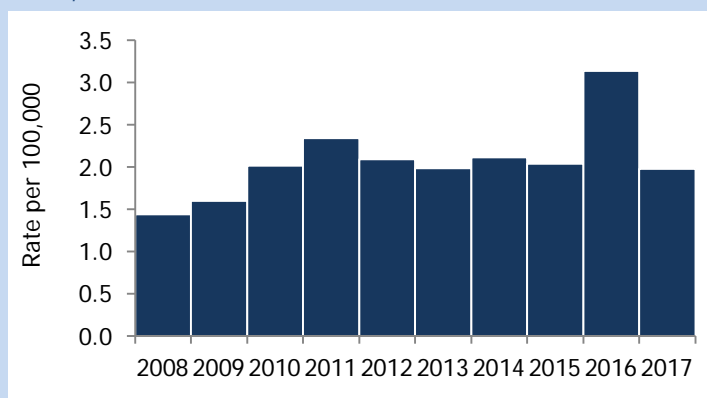
- In NSW: 17%
- In Australia & outside NSW: 1%
- Overseas: 80%
- Unknown: 3%

(based on responses from 98% of cases)

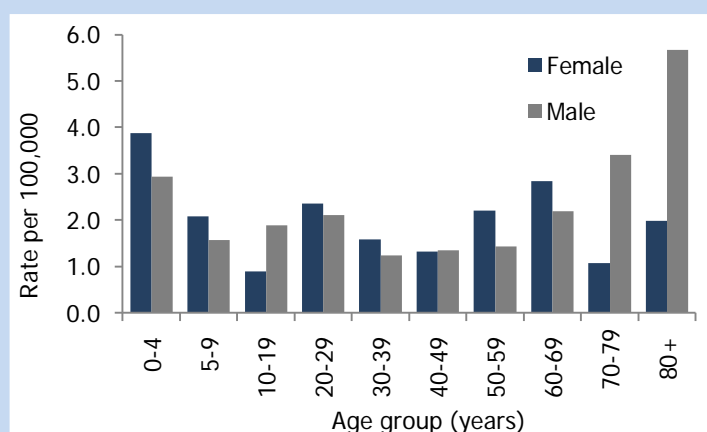
Outbreaks

- Cases found to be associated with an outbreak: 13 (8%) (pages 29-38)

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	8.6	9	2.6	2.6
FW	0.6	0	1.9	0.0
HNE	19.6	8	2.2	0.9
IS	9.6	7	2.4	1.7
M	2.4	10	1.0	4.1
MNC	5.6	8	2.6	3.6
NBM	4.6	6	1.3	1.6
NNSW	8	11	2.7	3.6
NS	30	29	3.4	3.2
SES	32	24	3.6	2.6
SNSW	3.8	3	1.9	1.4
SWS	14	17	1.5	1.7
SYD	16.4	12	2.7	1.8
WNSW	3	3	1.1	1.1
WS	13.2	9	1.4	0.9
NSW	171.4	156	2.3	2.0

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

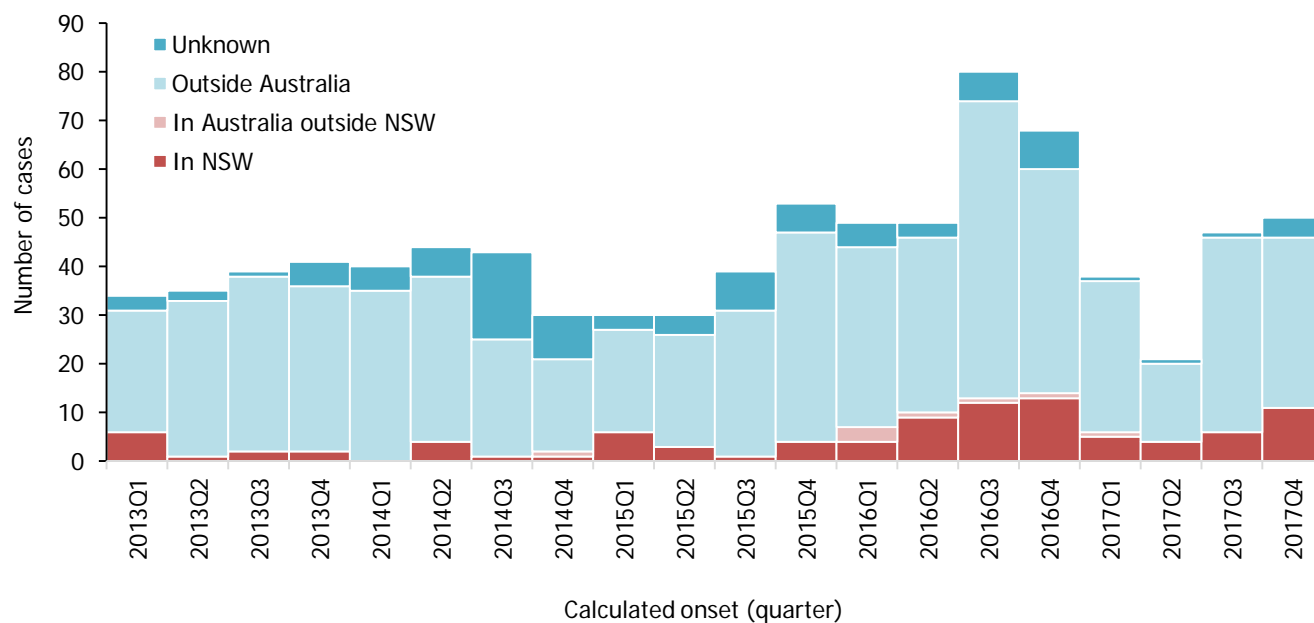
S. Enteritidis continued

Place of acquisition

Number and rate of *Salmonella* Enteritidis notifications by place of acquisition and year, 2012-2017, NSW

Year	Count		Rate (per 100,000)	
	Acquired in NSW	Acquired outside NSW	Acquired in NSW	Acquired outside NSW
2012	8	126	0.11	1.72
2013	11	125	0.15	1.69
2014	6	115	0.08	1.53
2015	14	120	0.18	1.58
2016	38	183	0.49	2.36
2017	26	123	0.33	1.56

Salmonella Enteritidis notifications by quarter and place of acquisition, NSW, 1 Jan 2013 to 31 Dec 2017



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 2017

- Case count: 108
- Reported hospitalisations: 15
- Reported deaths: 0
- Notification rate per 100,000: 1.37

Place of acquisition in 2017

- In NSW: 44%
- In Australia & outside NSW: 0%
- Overseas 50%
- Unknown: 6%

(based on responses from 80% of cases)

Overall trend

- 2.5% decrease in 2017 notification rate compared to 5 year annual mean (1.41 per 100,000)

Groups with highest notification rate in 2017

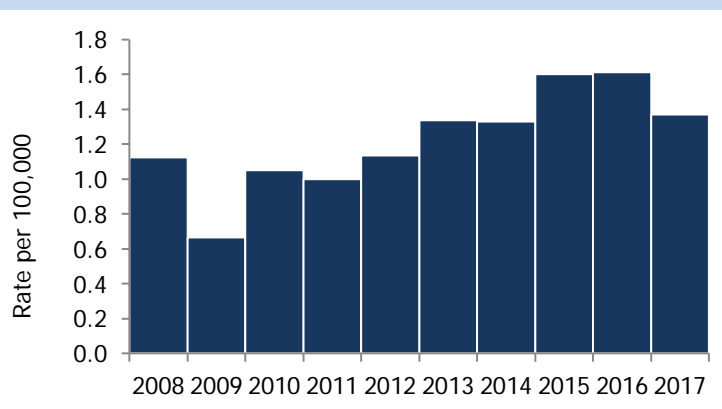
- Age: <5 years (32% of cases - 6.6 per 100,000)
- Sex: Male (61% of cases - 1.7 per 100,000)
- LHD: Northern Sydney (37% of cases - 4.4 per 100,000)

Outbreaks

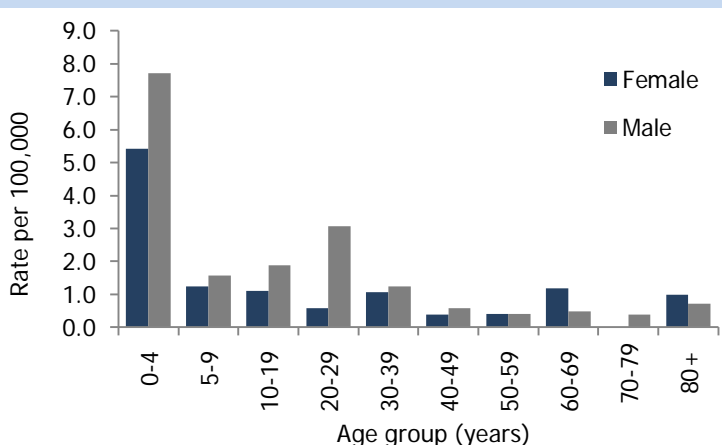
- Cases associated with an outbreak: 0%

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, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	3.8	6	1.1	1.7
FW	0.2	0	0.6	0.0
HNE	8	8	0.9	0.9
IS	4	6	1.0	1.5
M	0.6	3	0.3	1.2
MNC	1.2	1	0.6	0.4
NBM	5.2	6	1.4	1.6
NNSW	2.2	7	0.7	2.3
NS	46.8	40	5.2	4.4
SES	11	14	1.2	1.5
SNSW	0.8	0	0.4	0.0
SWS	5.4	6	0.6	0.6
SYD	6.6	5	1.1	0.8
WNSW	1.6	0	0.6	0.0
WS	8.4	6	0.9	0.6
NSW	105.8	108	1.4	1.4

* 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 2017

- Case count: 76
- Reported hospitalisations: 71
- Reported deaths: 0
- Notification rate per 100,000: 0.97

Overall trend

- 4.6% increase in 2017 notification rate compared to 5 year annual mean (0.92 per 100,000)

Groups with highest notification rate in 2017

- Age: 20-29 years (36% of cases - 2.6 per 100,000)
- Sex: Female (55% of cases – 1.1 per 100,000)
- LHD: Western Sydney (39% of cases – 3.1 per 100,000)

Seasonality

- Peaks typically in summer months (Jan-Feb)

Place of acquisition in 2017

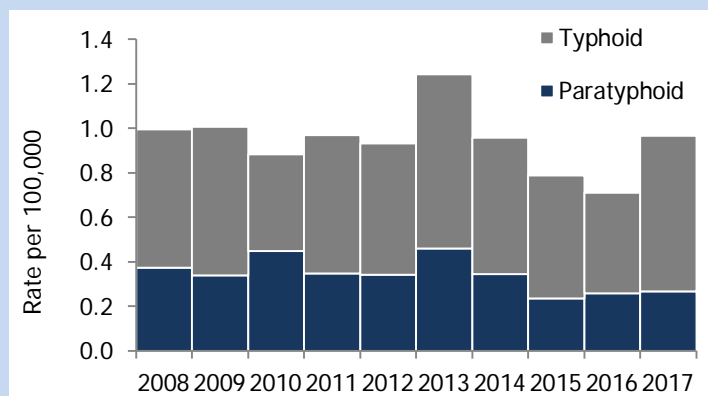
- In NSW: 0%
- In Australia & outside NSW: 1%
- Overseas: 97%
- Unable to be determined: 0%

(based on responses from 99% of cases)

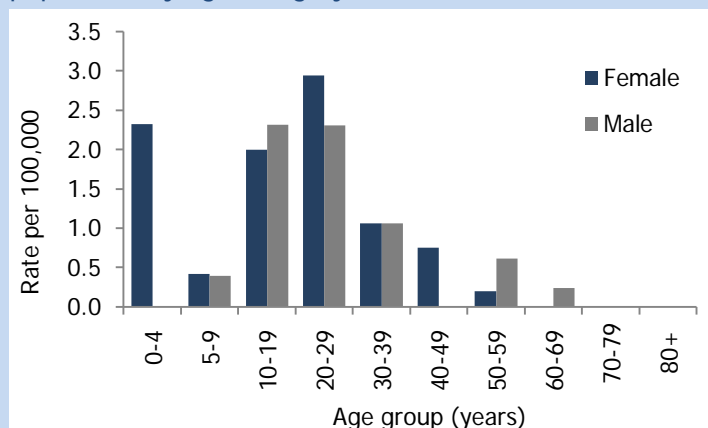
Outbreaks

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

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Typhoid and paratyphoid notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	0.2	2	0.1	0.6
FW	0	0	0.0	0.0
HNE	1.6	2	0.2	0.2
IS	1.6	1	0.4	0.2
M	1	0	0.4	0.0
MNC	0.6	0	0.3	0.0
NBM	1.2	2	0.3	0.5
NNSW	0.6	0	0.2	0.0
NS	7.8	10	0.9	1.1
SES	11.8	8	1.3	0.9
SNSW	1	0	0.5	0.0
SWS	10.4	10	1.1	1.0
SYD	9	10	1.5	1.5
WNSW	0.4	1	0.1	0.4
WS	22.2	30	2.5	3.1
NSW	69.4	76	0.9	1.0

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

Typhoid and Paratyphoid continued

Country where infection acquired*

Country of acquisition for overseas acquired typhoid and paratyphoid cases, 2017

County of acquisition	Paratyphoid	Typhoid	Total
India	8	22	30
Bangladesh	3	12	15
Pakistan	4	5	9
Nepal	0	5	5
Philippines	0	3	3
Samoa	0	3	3
Iraq	1	1	2
Colombia	0	1	1
Fiji	0	1	1
Samoa, American	0	1	1
Cambodia	1	0	1
Unable to be determined	4	0	4
Total	21	54	75

*One typhoid case was acquired in Australia in 2017 due to person-to-person transmission from someone who had acquired the infection overseas.

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 2017

- Case count: 230
- Reported hospitalisations: 63
- Reported deaths: 0
- Notification rate per 100,000: 2.9

Overall trend

- 14% increase in 2017 notification rate compared to 5 year annual mean (2.6 per 100,000)
- 25% decrease compared to 2016

Groups with highest notification rate in 2017

- Age: 30-39 years (28% of cases – 5.7 per 100,000)
- Sex: Male (72% of cases – 4.2 per 100,000)
- LHD: Sydney (28% of cases – 9.8 per 100,000)

Seasonality

- No significant trend (slight peak in Jan-Mar)

Place of acquisition in 2017

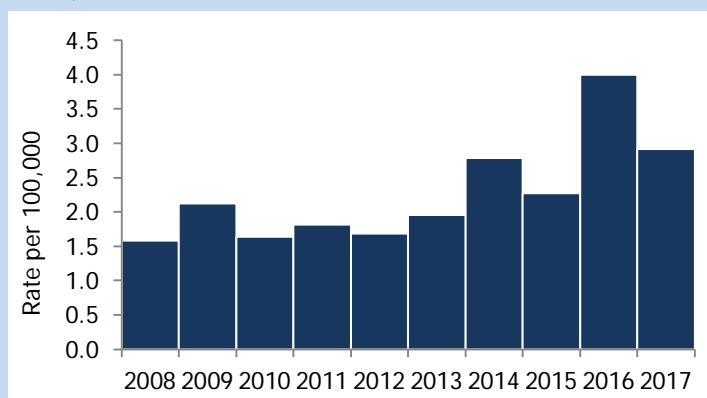
- In NSW: 46%
- In Australia & outside NSW: 5%
- Overseas: 45%
- Unknown: 5%

(based on responses from 97% of cases)

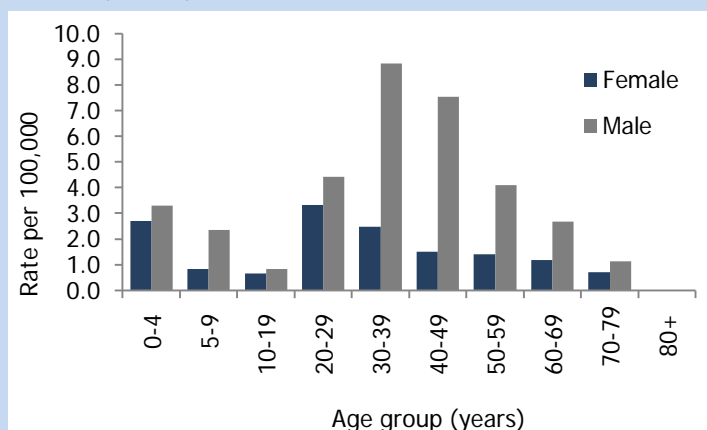
Possible risk exposures reported (locally acquired only)

- Men who have sex with men (MSM): 47%
- Household contact: 5%
- Associated with foodborne outbreak: 0%
- Unknown: 48%

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	8.8	10	2.6	2.9
FW	0.4	0	1.3	0.0
HNE	7.8	9	0.9	1.0
IS	5.4	2	1.4	0.5
M	2.2	2	0.9	0.8
MNC	2.8	1	1.3	0.4
NBM	4.8	7	1.3	1.8
NNSW	7.8	5	2.7	1.6
NS	23	23	2.6	2.5
SES	57	60	6.4	6.5
SNSW	1.4	1	0.7	0.5
SWS	11.8	18	1.3	1.8
SYD	42.4	64	6.8	9.8
WNSW	2.2	1	0.8	0.4
WS	14.2	27	1.5	2.8
NSW	192	230	2.5	2.9

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

Shigellosis continued

Place where infection acquired

Place of acquisition for shigellosis 2012-2017, NSW

Place of acquisition	2012	2013	2014	2015	2016	2017
Acquired in NSW	25	54	115	65	153	102
Acquired in Australia outside NSW	2	2	4	9	6	10
Acquired overseas	70	66	50	84	92	99
Unknown	26	23	40	15	59	19
Total	123	145	209	173	310	230

Reported risk exposures for those infections acquired in Australia

Reported risk exposure for shigellosis cases with no travel history, 2012-2017, NSW

Reported risk exposure	2012	2013	2014	2015	2016	2017
Men who have sex with men (MSM)	10	32	78	33	103	64
Household contact	6	3	5	9	12	7
Unknown	40	50	68	55	115	65
Total	56	85	151	97	230	136

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 2017

- Case count: 20
- Reported hospitalisations: 19
- Reported deaths: 3
- Notification rate per 100,000: 0.3

Overall trend

- 38% decrease in 2017 notification rate compared to 5 year annual mean (0.4 per 100,000)

Groups with highest notification rate in 2017

- Age: 80+ years (15% of cases – 0.8 per 100,000)
- Sex: Female (65% of cases - 0.5 per 100,000)

Seasonality

- Peak in summer (Dec-Jan)

Place of acquisition in 2017

- In NSW: 83%
- In Australia & outside NSW: 0%
- Overseas: 0%
- Unknown: 17%

(based on responses from 90% of cases)

Most common comorbidities reported

- Cancer: 5
- Diabetes (non-insulin dependent): 4

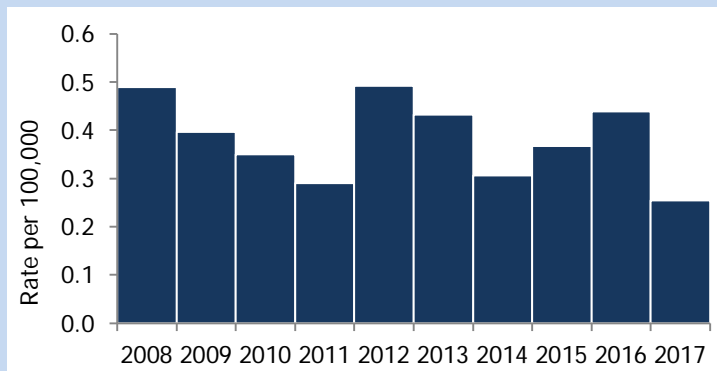
Perinatal

- Four maternal-infant pairs
- 1 pregnancy with fetal loss

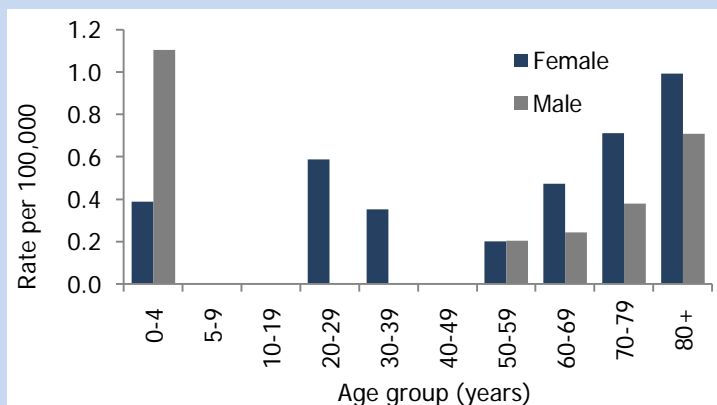
Deaths

Three deaths occurred in people aged 0-91 years old, all males, from Hunter New England, South Western Sydney and Western Sydney regions.

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

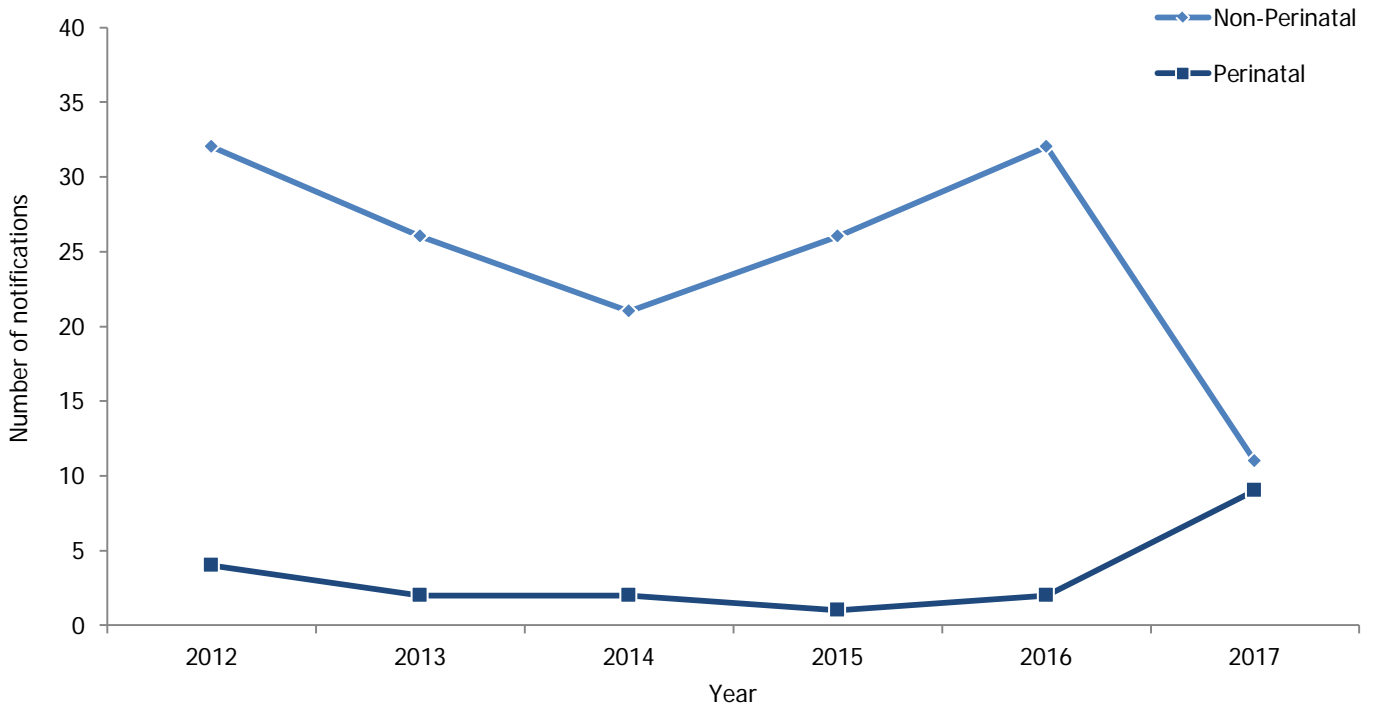
LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	1.2	0	0.4	0.0
FW	0	0	0.0	0.0
HNE	2	2	0.2	0.2
IS	2.6	0	0.7	0.0
M	0.6	1	0.3	0.4
MNC	0.2	0	0.1	0.0
NBM	0.8	0	0.2	0.0
NNSW	0.6	1	0.2	0.3
NS	4.6	4	0.5	0.4
SES	5.2	3	0.6	0.3
SNSW	1.2	1	0.6	0.5
SWS	5	4	0.5	0.4
SYD	2.8	2	0.5	0.3
WNSW	0.6	0	0.2	0.0
WS	3	2	0.3	0.2
NSW	30.6	20	0.4	0.3

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

Listeriosis continued

Perinatal cases

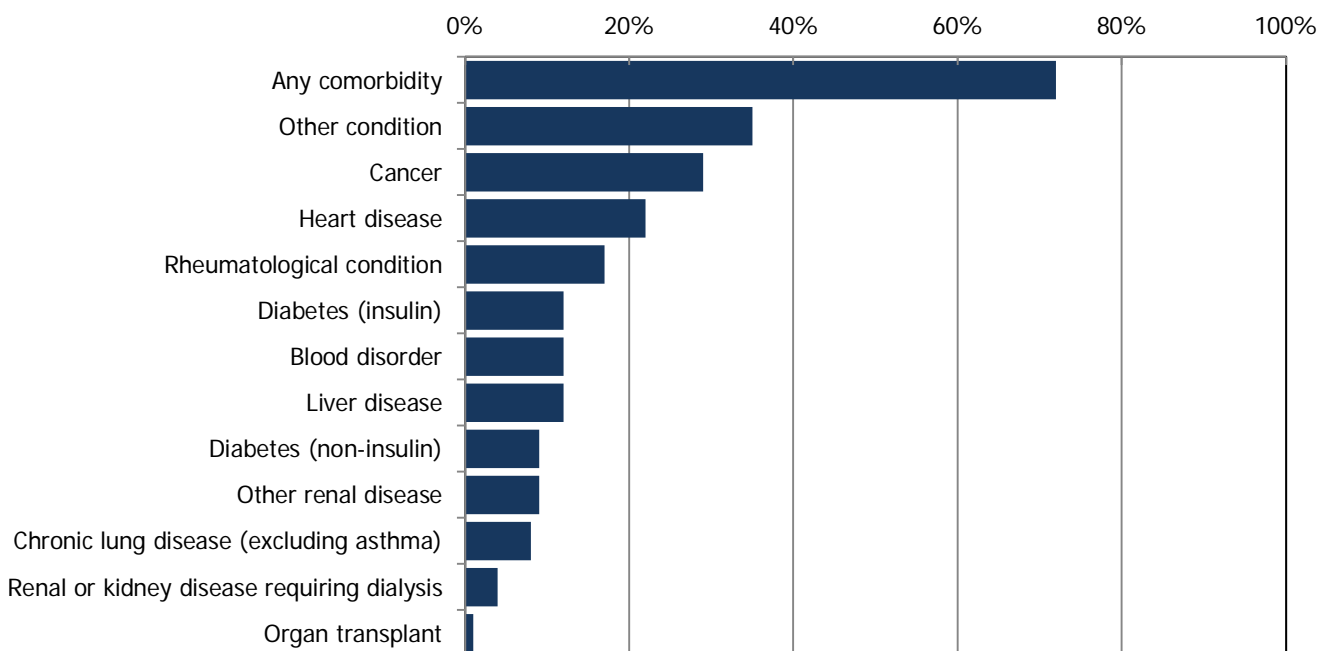
Perinatal and non-perinatal reported listeriosis, 2012-2017, NSW



Reported comorbidities

Proportion of listeriosis patients who reported a comorbidity or condition, 2013-2017, NSW

Percentage of patients



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 2017

- Case count: 51
- Reported hospitalisations: 24
- Reported deaths: 0
- Notification rate per 100,000: 0.7

Overall trend

- 45% increase in 2017 notification rate compared to 5 year annual mean (0.5 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 2017

- Age: 10-19 years (14% of cases – 0.8 per 100,000), 50-59 years (14% of cases – 0.7 per 100,000)
- Sex: Male (61% of cases - 0.8 per 100,000)
- LHD: Western Sydney (25% of cases- 1.3 per 100,000)

Seasonality

- Peaks from October to February

Place of acquisition in 2017

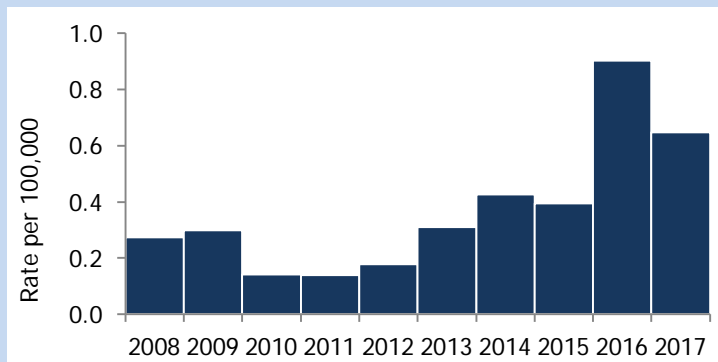
- In NSW: 89%
- In Australia & outside NSW: 2%
- Overseas: 7%
- Unknown: 2%

(based on responses from 88% of cases)

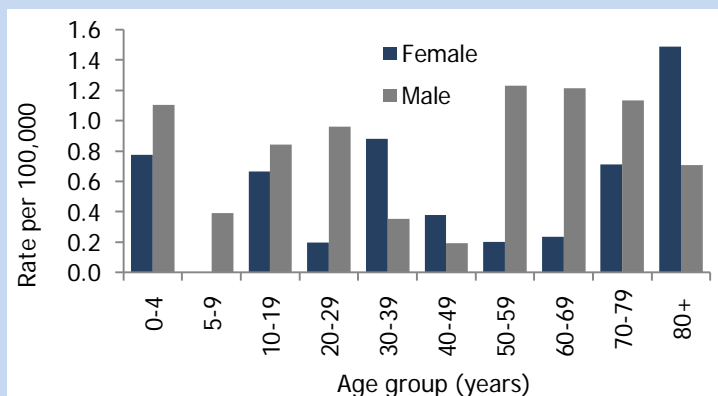
Possible risk exposures reported (locally acquired only)

- Restaurant during incubation: 44%
- Ate beef during incubation: 42%
- Animal contact: 46%
- Farm exposure: 17%

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	0.8	1	0.2	0.3
FW	0.4	0	1.3	0.0
HNE	7.8	7	0.9	0.8
IS	1.6	2	0.4	0.5
M	3.2	12	1.3	5.0
MNC	0.4	0	0.2	0.0
NBM	0.4	0	0.1	0.0
NNSW	1.4	0	0.5	0.0
NS	0.8	0	0.1	0.0
SES	4.2	1	0.5	0.1
SNSW	4	9	1.9	4.2
SWS	1.4	0	0.2	0.0
SYD	0.8	1	0.1	0.2
WNSW	2.8	5	1.0	1.8
WS	3.4	13	0.4	1.3
NSW	33.6	51	0.4	0.6

* 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 2017

- Case count: 2
- Reported hospitalisations: 2
- Reported deaths: 0
- Notification rate per 100,000: 0.03

Overall trend

- 76% decrease in 2017 notification rate compared to 5 year annual mean (0.11 per 100,000)

Groups with highest notification rate in 2017

- Sex: Male (50% of cases - 0.03 per 100,000)

Seasonality

- Peaks in summer months (Dec-Jan)

Place of acquisition in 2017

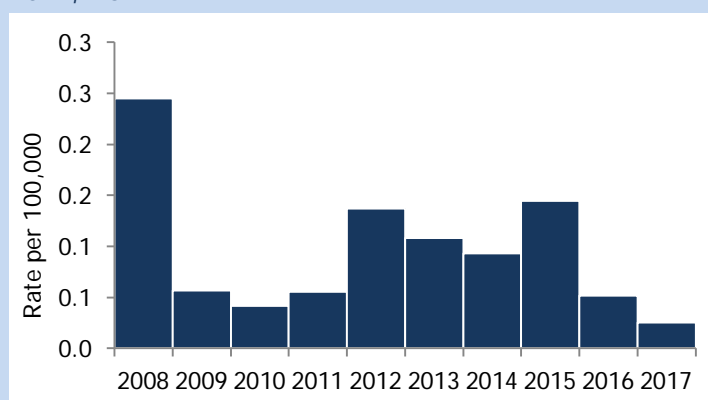
- In NSW: 0%
- In Australia & outside NSW: 0%
- Overseas: 100%
- Unknown: 0%

(based on responses from 50% of cases)

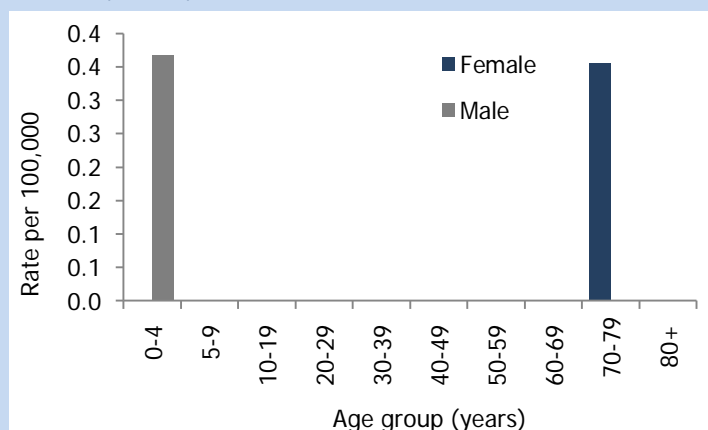
Bacterial infection

- In 1 case, STEC infection was identified (serogroup unknown)

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	0	0	0.0	0.0
FW	0.2	0	0.6	0.0
HNE	1.2	0	0.1	0.0
IS	0.6	1	0.2	0.2
M	0.4	0	0.2	0.0
MNC	0.2	0	0.1	0.0
NBM	0.4	0	0.1	0.0
NNSW	0.2	0	0.1	0.0
NS	1.4	1	0.2	0.1
SES	0.8	0	0.1	0.0
SNSW	0.4	0	0.2	0.0
SWS	1	0	0.1	0.0
SYD	0.4	0	0.1	0.0
WNSW	0.8	0	0.3	0.0
WS	0.4	0	0.0	0.0
NSW	8	2	0.1	0.0

* 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 2017

- Case count: 1249
- Reported hospitalisations: 67
- Reported deaths: 0
- Notification rate per 100,000: 15.9

Overall trend

- 33.5% increase in the 2017 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 (page 26)

Groups with highest notification rate in 2017

- Age: <5 years (30% of cases - 71.1 per 100,000)
- Sex: Female (52% of cases – 16.4 per 100,000)
- LHD: Northern NSW (7% of cases – 28.1 per 100,000)

Seasonality

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

Place of acquisition in 2017

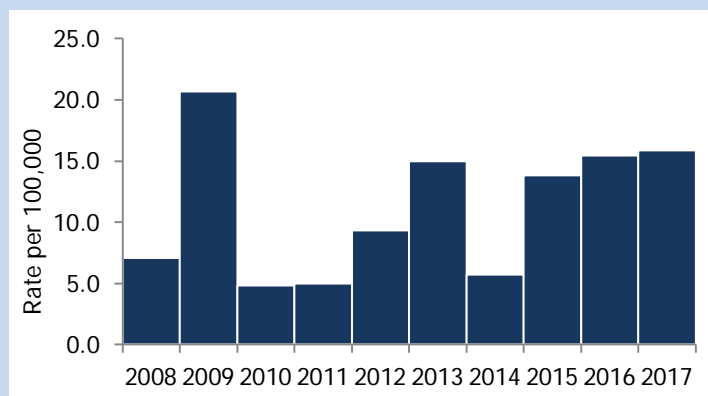
- In NSW: 76%
- In Australia & outside NSW: 4%
- Overseas: 12%
- Unknown: 9%

(based on responses from 70% of cases)

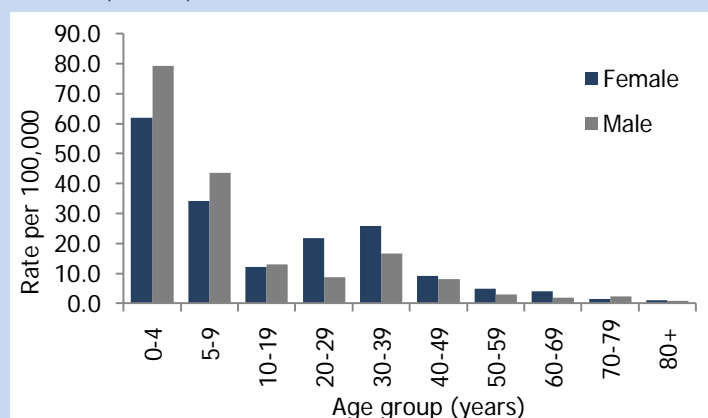
Possible risk exposures reported (locally acquired only)

- Public swimming pool: 33%
- Farm animal exposure: 5%
- Tank water: 6%

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	34.2	41	10.3	12.0
FW	1.2	1	3.9	3.3
HNE	130.2	147	14.4	15.9
IS	45	75	11.3	18.3
M	36.6	50	15.2	20.6
MNC	21.8	32	10.2	14.6
NBM	37	81	10.2	21.5
NNSW	52.4	86	17.7	28.5
NS	139.8	203	15.7	21.8
SES	136.2	131	15.4	14.1
SNSW	16.8	23	8.3	11.0
SWS	49	126	5.3	12.7
SYD	71.2	71	11.6	10.8
WNSW	50.2	51	18.1	18.2
WS	72	131	7.9	13.5
NSW	893.6	1249	11.9	15.9

* 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 2017

- Case count: 3124
- Reported hospitalisations: 8*
- Reported deaths: 0
- Notification rate per 100,000: 39.7

*Hospitalisations may be underestimated as most giardiasis cases are not investigated

Overall trend

- 6% increase in 2017 notification rate compared to 5 year average (37.4 per 100,000)
- Increased use of more sensitive tests may account for some of the increase in notifications since 2013 (page 26)

Groups with highest notification rate in 2017

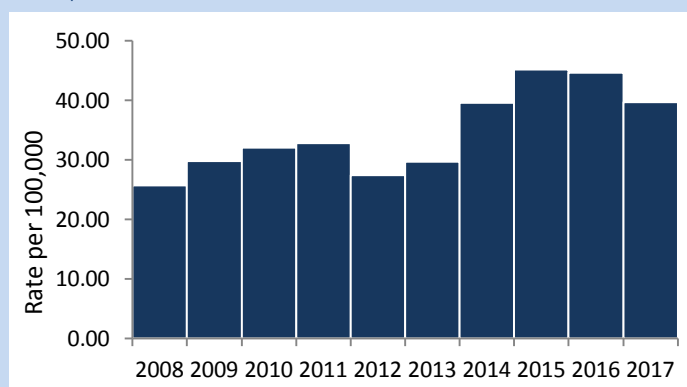
- Age: <5 years (22% of cases – 130.4 per 100,000)
- Sex: Male (52% of cases – 41.2 per 100,000)
- LHD: South Eastern Sydney (18% of cases – 59.5 per 100,000)

Seasonality

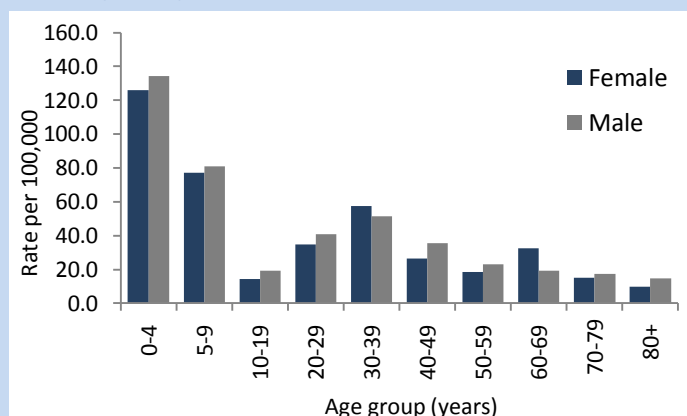
- Peaks in summer months (Feb-Mar)

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

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	109.8	135	33.0	39.1
FW	5	3	16.1	9.8
HNE	361.2	390	39.9	41.9
IS	173	161	43.5	39.4
M	99.6	107	41.4	44.2
MNC	64	90	30.0	40.5
NBM	134.6	123	37.1	32.0
NNSW	79	159	26.7	51.9
NS	475.6	486	53.2	53.1
SES	492.6	552	55.6	59.5
SNSW	59	54	29.1	25.2
SWS	176.6	196	19.0	19.8
SYD	245.8	303	39.7	46.3
WNSW	117.6	108	42.4	38.6
WS	220.6	257	24.3	26.5
NSW	2814.6	3124	37.3	39.7

* 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 2017

- Case count: 70
- Reported hospitalisations: 36
- Reported deaths: 0
- Notification rate per 100,000: 0.9

Overall trend

- 12% increase in 2017 notification rate compared to 5 year average (0.8 per 100,000)

Groups with highest notification rate in 2017

- Age: 20-29 years (37% of cases – 2.5 per 100,000)
- Sex: Male (77% of cases – 1.4 per 100,000)
- LHD: Sydney (19% of cases – 2.0 per 100,000)

Seasonality

- Peaks in summer months (Jan-Feb)

Place of acquisition in 2017

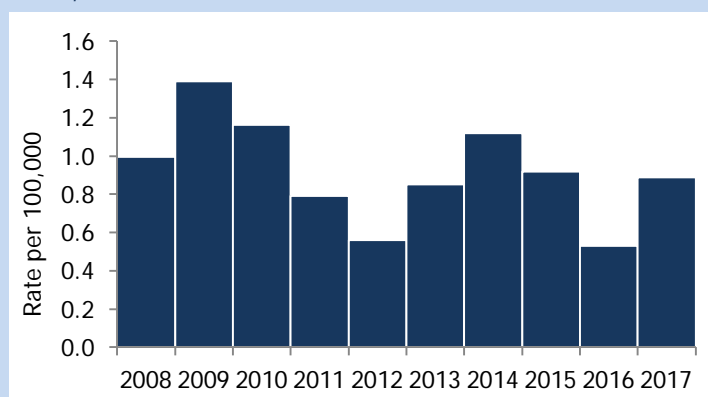
- In NSW: 53%
- In Australia & outside NSW: 0%
- Overseas: 47%
- Unknown: 0%

(note: data available on 100% of cases)

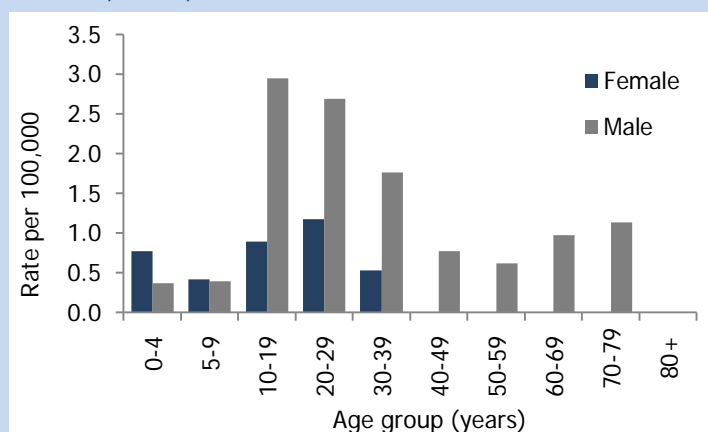
Outbreak

- 53% cases associated with outbreak (page 23)

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	1.6	3	0.5	0.9
FW	0	0	0.0	0.0
HNE	1.6	5	0.2	0.5
IS	1.6	1	0.4	0.2
M	0	0	0.0	0.0
MNC	0.8	0	0.4	0.0
NBM	1.6	3	0.4	0.8
NNSW	2	2	0.7	0.7
NS	5.6	7	0.6	0.8
SES	9	16	1.0	1.7
SNSW	0.8	0	0.4	0.0
SWS	9.2	10	1.0	1.0
SYD	6.8	13	1.1	2.0
WNSW	1.4	1	0.5	0.4
WS	17.8	9	2.0	0.9
NSW	59.8	70	0.8	0.9

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

Hepatitis A continued

Place infection was acquired

Hepatitis A notifications by place of acquisition, 2017 compared to the previous 5 year annual mean, NSW

Place of acquisition	5 year annual mean		2017	
	Count	%	Count	%
Acquired in Australia outside NSW	0.2	0%	0	0%
Acquired in NSW	12.2	20%	37	53%
Acquired outside Australia	46.4	78%	33	47%
Unknown	1.0	2%	0	0%
Total	59.8	100%	70	100%

Country infection was acquired

Hepatitis A notifications by country of acquisition, 2017 compared to the previous 5 year annual mean, NSW

Country of acquisition	5 year average		2017	
	Count	%	Count	%
Australia	12.4	21%	37	53%
India	8.0	13%	6	9%
Nepal	0.0	0%	4	6%
Bangladesh	2.2	4%	3	4%
Jordan	0.0	0%	2	3%
Other*	35.4	59%	13	19%
Missing and unknown	1.8	3%	5	7%
Total	59.8	100%	70	100%

*any county with only 1 notification is included in other category

Hepatitis A outbreak related to person-to-person transmission in 2017

Between 25 July to 22 December 2017, 37 cases of hepatitis A were reported in adults in NSW with one of three strains of the virus linked to international outbreaks. The majority of these infections were thought to have been acquired through male to male sexual transmission. Thirty-five (95%) of the 37 cases were male, with 20 reporting being men who have sex with men (MSM). Thirty-one cases (84%) lived in the metropolitan Sydney region, and three of the six cases who lived outside Sydney reported travel to Sydney during their exposure period. Five of the 37 cases travelled outside Australia during their exposure period. All viruses detected as part of locally acquired outbreaks in Australia were related to strains circulating in Europe in 2017 associated with a large, multi-country outbreak.

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 2017

- Case count: 18
- Reported hospitalisations: 15
- Reported deaths: 2
- Notification rate per 100,000: 0.23

Overall trend

- 16% decrease in 2017 notification rate compared to 5 year average (0.27 per 100,000)

Groups with highest notification rate in 2017

- Age: 20-29 years (22% of cases - 0.4 per 100,000)
- Sex: Male (72% of cases - 0.3 per 100,000)
- LHD: Northern Sydney and South Eastern Sydney (22% of cases - 0.4 per 100,000 respectively)

Place of acquisition in 2017

- In NSW: 22%
- In Australia & outside NSW: 0%
- Overseas: 78%
- Unknown: 0%

(note: data available on 100% of cases)

Possible risk exposures reported (locally acquired)*

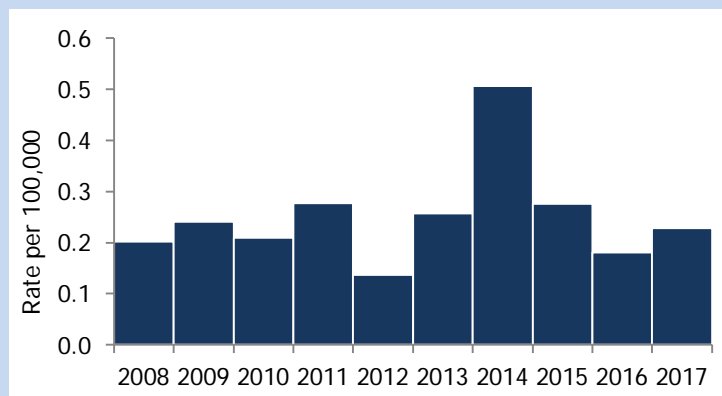
- Pork consumption: 100%
- Shellfish consumption: 100%

*Note: only four locally acquired cases were reported in 2017. Food consumption known for two of four cases.

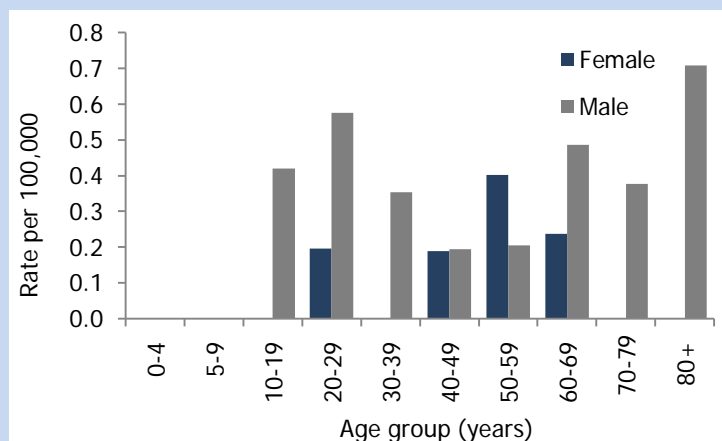
Deaths

The deaths occurred in two males aged 51 and 83 years old from Hunter New England and Northern NSW regions. Both had significant underlying conditions which contributed to the fatal outcome.

Notification rate per 100,000 population by year, 2008 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	0.4	0	0.1	0.0
FW	0	0	0.0	0.0
HNE	0.4	2	0.0	0.2
IS	0	0	0.0	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	1	0.0	0.3
NS	4.2	4	0.5	0.4
SES	3.8	4	0.4	0.4
SNSW	0	0	0.0	0.0
SWS	2.6	1	0.3	0.1
SYD	2.6	3	0.4	0.5
WNSW	0	0	0.0	0.0
WS	6.2	3	0.7	0.3
NSW	20.4	18	0.3	0.2

* 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 2017

- Case count: 2314
- Reported hospitalisations: 200*
- Reported deaths: 0
- Notification rate per 100,000: 29.4

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

Overall trend

- 131% increase in 2017 notification rate compared to 5 year average (12.7 per 100,000)

Groups with highest notification rate in 2016

- Age: <5 years (44% of cases – 192.3 per 100,000)
- Sex: Female (51% of cases – 29.7 per 100,000)
- LHD: South Eastern Sydney (15% of cases – 45.3 per 100,000)

Seasonality

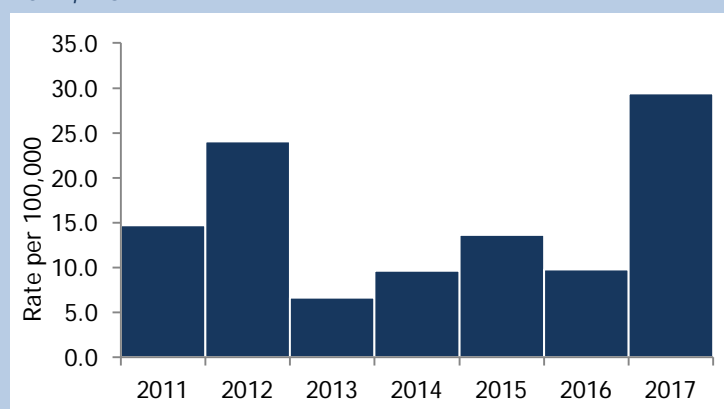
- Peaks in spring (Sep-Oct)

Outbreaks

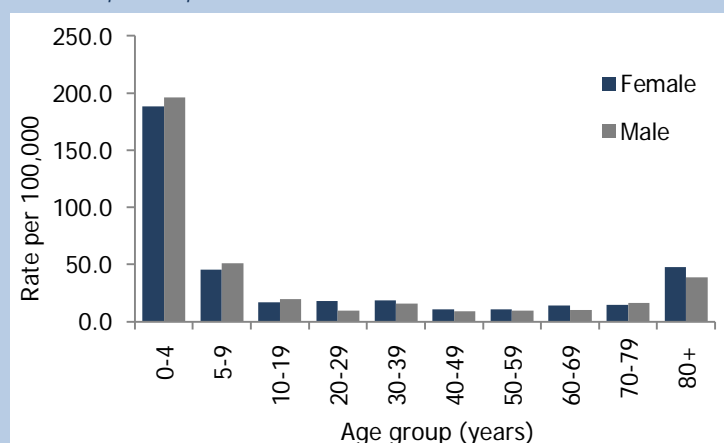
- Cases found to be associated with an institutional outbreak: 35 (1.5%)
- In the second half of 2017, NSW experienced a state-wide outbreak of rotavirus gastroenteritis. Notifications peaked in September with 642 notifications, 3.7 times the average notifications for this month. Rotavirus-associated hospital admissions also increased. An enhanced epidemiological review linking hospital, notification and genotyping data is in progress to describe the outbreak.

Note: Rotavirus was made notifiable in 2010.

Notification rate per 100,000 population by year, 2011 – 2017, NSW



Notification rate per 100,000 population by age category and sex, 2017, NSW



Number of cases and rates (per 100,000) by Local Health District, 2017, NSW

LHD	Count		Rate	
	5Yr mean	2017	5yr mean	2017
CC	25.4	68	7.7	19.7
FW	5	7	16.1	22.9
HNE	125.2	178	14.0	19.1
IS	33.4	57	8.5	13.9
M	27.2	71	11.4	29.3
MNC	7.2	8	3.4	3.6
NBM	51.8	73	14.4	19.0
NNSW	47.8	133	16.3	43.4
NS	133.6	348	15.0	38.0
SES	125.4	420	14.2	45.3
SNSW	11.8	24	5.8	11.2
SWS	96.8	329	10.5	33.2
SYD	75.2	211	12.3	32.2
WNSW	59.6	49	21.5	17.5
WS	129.8	338	14.4	34.8
NSW	955.8	2314	12.8	29.4

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

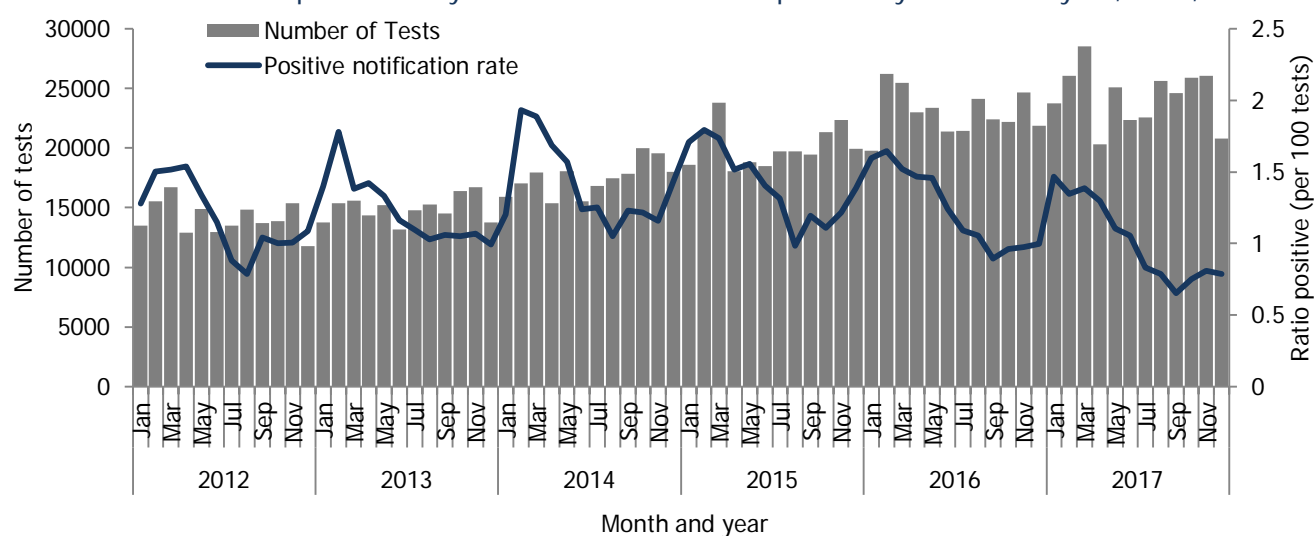
DENOMINATOR DATA

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 2017:

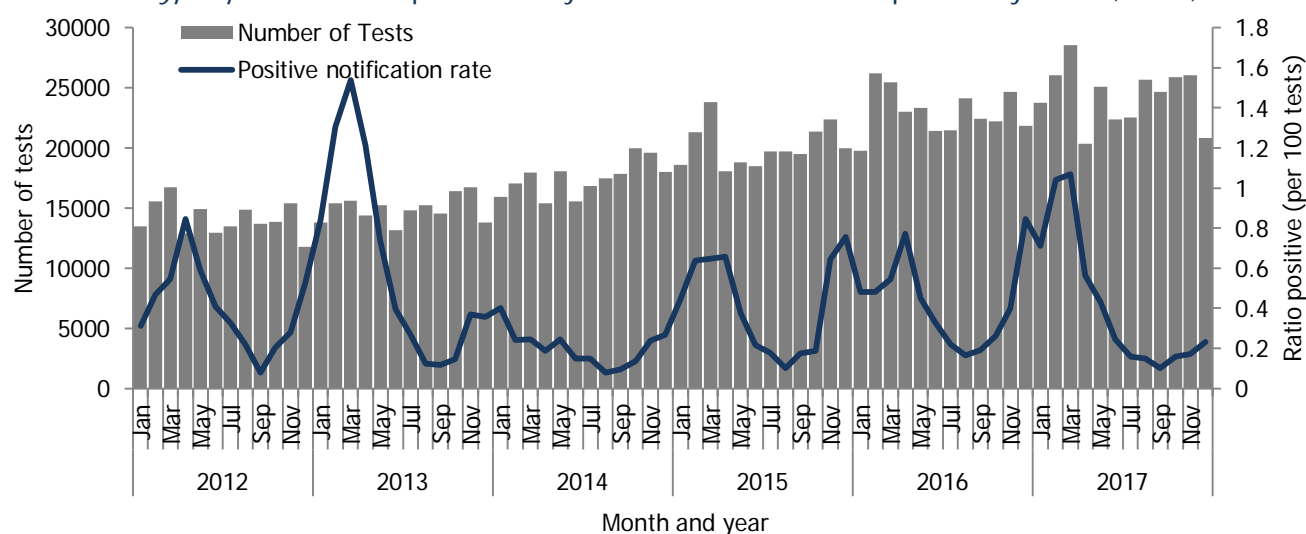
- *Giardia* positive notification rates peaked during late-summer at 1.47 (per 100 tests performed)
- *Cryptosporidium* positive notification rates peaked at the start of Autumn at 1.07 (per 100 tests performed)
- *Salmonella* positive notification rates followed the seasonal pattern, peaking in January at 2.14 (per 100 tests performed)
- *Shigella* positive notification rate was highest in January at 0.12 (per 100 tests performed)

Number of *Giardia* tests performed by 15 laboratories and rate positive by month and year, NSW, 2012–2017*



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

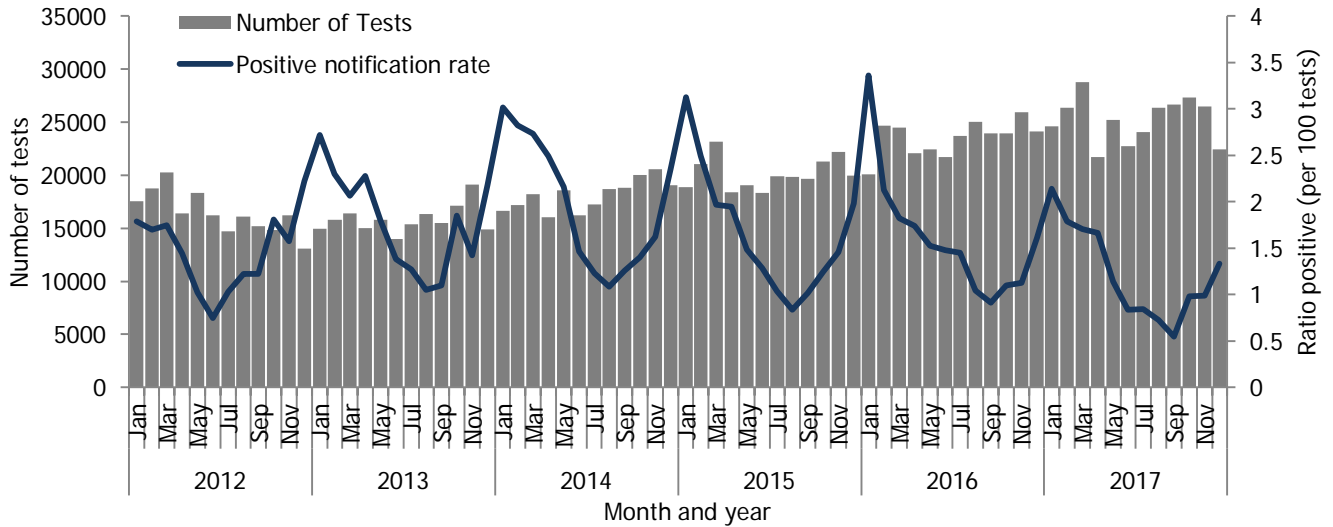
Number of *Cryptosporidium* tests performed by 15 laboratories and rate positive by month, NSW, 2012–2017*



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

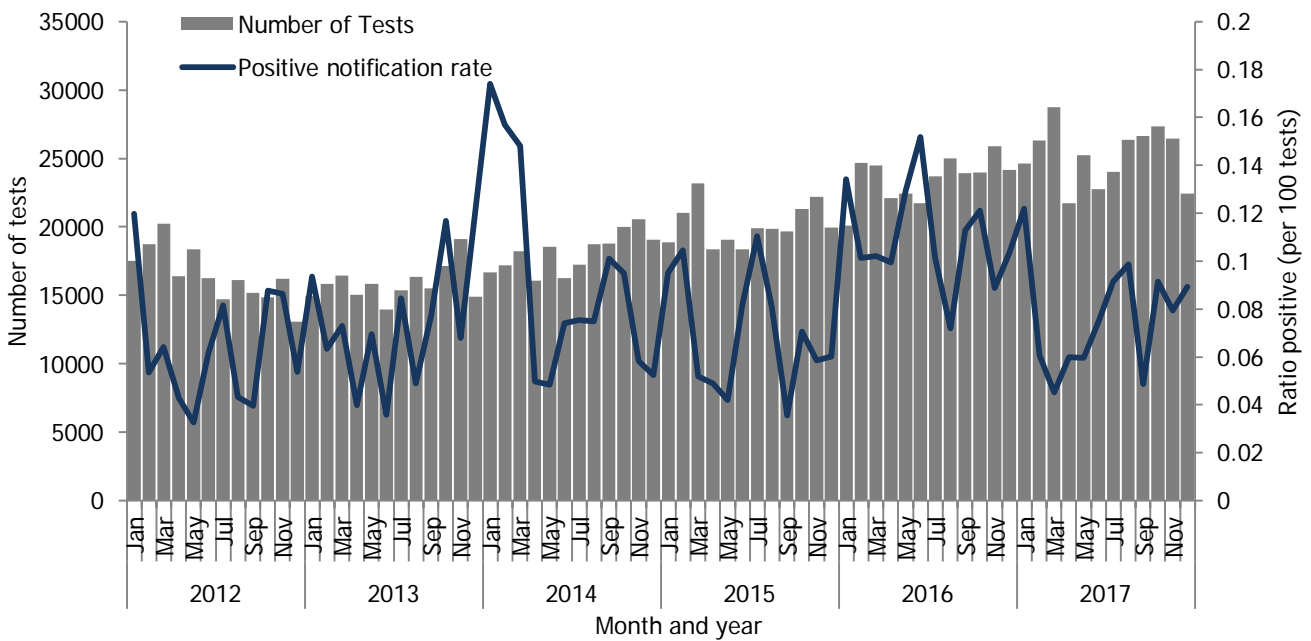
Denominator data continued

Number of *Salmonella* tests performed by 15 laboratories and rate positive by month, NSW, 2012–2017*



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

Number of *Shigella* tests performed by 15 laboratories and rate positive by month, NSW, 2012–2017*



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

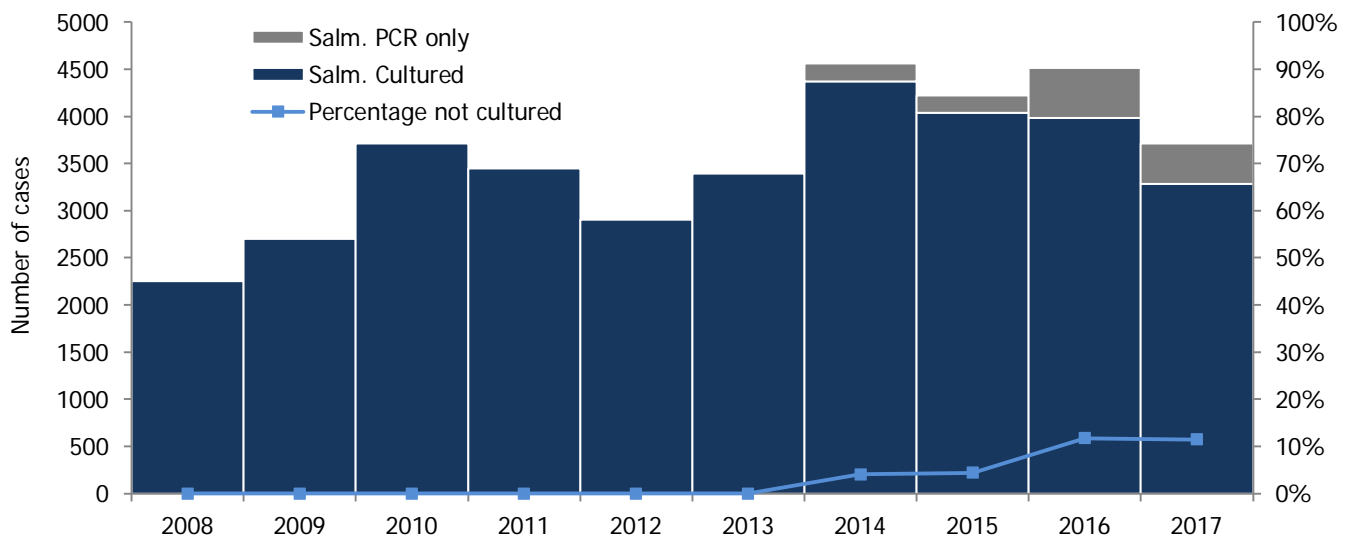
CULTURE INDEPENDENT TESTING

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.

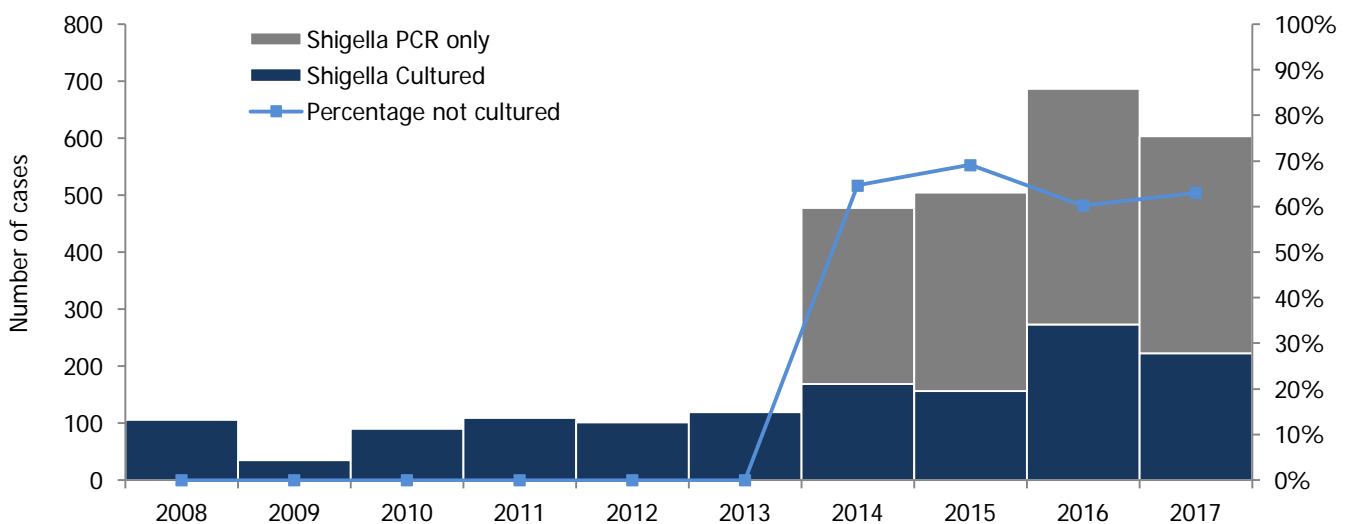
Summary for 2017:

- 11% of *Salmonella* notifications in 2017 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.
- 63% of *Shigella* notifications in 2017 could not be cultured or were not cultured.
 - PCR positive *Shigella* are 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* also 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, 2008 - 2017



The number of *Shigella* notifications, by test type, and the percentage with only PCR* positive result in NSW, 2008 - 2017



* PCR only notifications will be underestimated as data is not complete for this group.

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 2017

- Foodborne outbreaks investigated: 38
- Outbreak related cases: 437

Overall trend

- 30% decrease in the number outbreaks compared to 5 year annual mean (54 outbreaks)
- 33% decrease in the number of outbreak-related cases compared to 5 year annual mean (656 people ill)

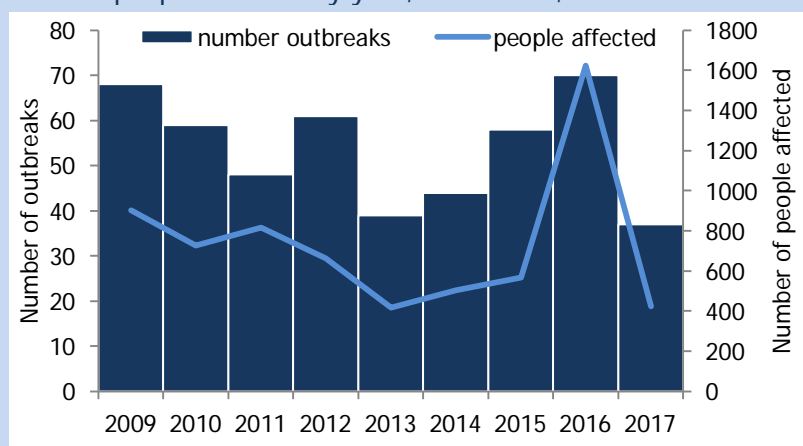
Causative agent in 2017

- Unknown: 55%
- *Salmonella*: 24%
- *Campylobacter*: 8%
- Norovirus: 11%
- Ciguatera toxin: 3%

Contributing factors in 2017

- Unknown 76%
- Improper food handling/preparation: 13%
- Person to food to person: 5%
- Improper use of non-potable water: 3%
- Biotoxins in fish: 3%

Number of foodborne or suspected foodborne outbreaks and number people affected by year, 2009-2017, NSW



Number of foodborne outbreaks and number of people affected by local health district, 2017, NSW

LHD	2017	No. ill
CC	2	20
FW	0	0
HNE	7	119
IS	3	15
M	2	26
MNC	0	0
NBM	0	0
NNSW	0	0
NS	3	12
SES	12	155
SNSW	0	0
SWS	1	16
SYD	4	38
WNSW	0	0
WS	2	19
NSW*	2	15

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

Foodborne outbreak by causative agent and year, 2012-2017, NSW

Causative agent	2012	2013	2014	2015	2016	2017
Unknown	28	19	8	25	34	21
<i>Salmonella</i> (all serotypes)	27	12	26	23	20	9
<i>Salmonella</i> Typhimurium	23	9	26	19	14	4
Norovirus	1	6	1	2	7	4
<i>Campylobacter</i>	0	1	0	2	2	3
<i>Clostridium perfringens</i>	2	2	0	1	0	0
Fish poisoning	1	0	4	4	4	1
<i>Listeria</i>	0	1	1	0	1	0
Hepatitis E	0	0	1	0	0	0
STEC	0	0	1	0	0	0
Hepatitis A	0	0	0	1	0	0
<i>Shigella</i>	0	0	1	0	2	0
Total outbreaks	61	39	44	58	70	38

Foodborne outbreaks continued

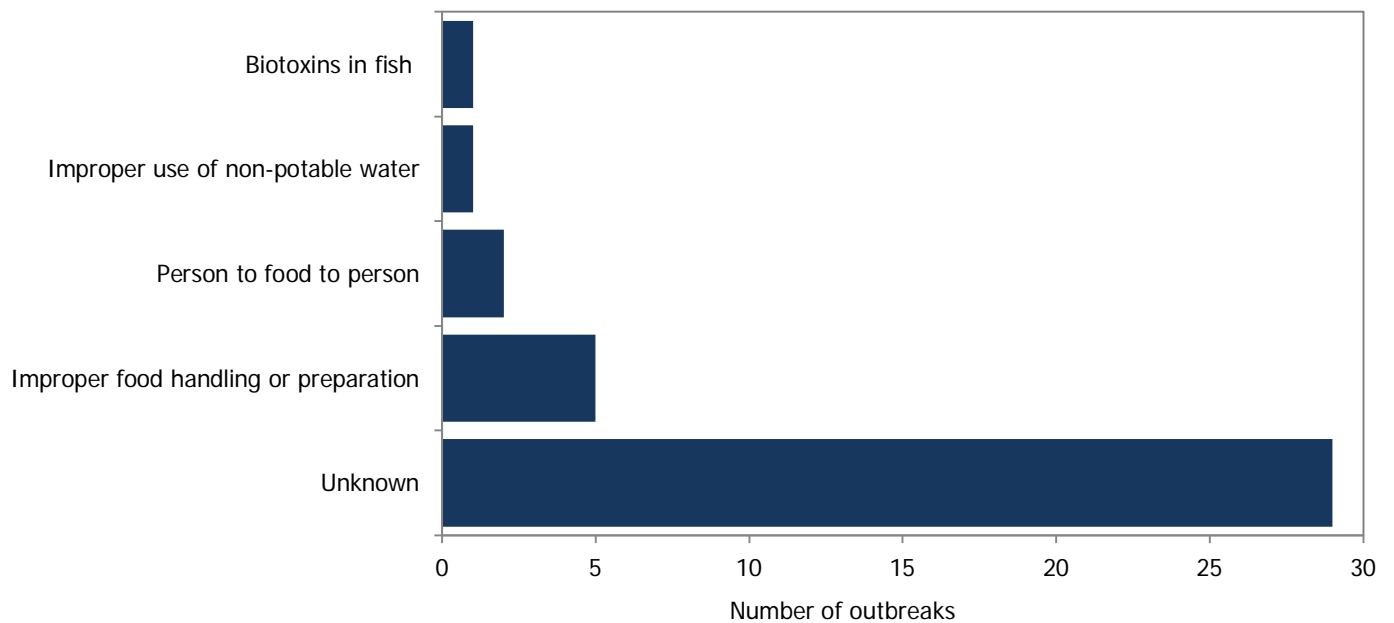
Description of outbreaks by causative agent

Number of outbreaks, number ill and number hospitalised by causative agent, 2017, NSW

Causative agent	Number of outbreaks	Number ill	Ratio ill per outbreak	Number hospitalised	Ratio hospitalised per outbreak
Unknown	21	245	11.7	2	0.1
Other <i>Salmonella</i>	5	36	7.2	1	0.2
<i>Salmonella</i> Typhimurium	4	35	8.8	4	1.0
Norovirus	4	74	24.7	4	1.3
<i>Campylobacter</i>	3	29	9.7	0	0.0
Fish Poisoning	1	4	4.0	4	4.0
Total	38	435	11.4	15	0.4

Summary foodborne outbreaks by contributing factors

Foodborne outbreaks by contributing factors, 2017, NSW



OUTBREAK SUMMARY 2017

Foodborne and potentially foodborne disease outbreaks investigated in NSW, 2017

PHU ID number	Month of onset	Setting	Pathogen	No. ill	Lab confirmed	No. hospitalised	Evidence*	Epi. Study**	Suspected / Responsible vehicle	Contributing factors
HUN0508	Feb	Aged care	<i>Campylobacter</i> species	6	2	0	D	N	Unknown	Unknown
HUN0511	Apr	Commune	<i>Campylobacter</i> species	21	4	0	D	C	Unknown	Unknown
SES57914	Dec	Restaurant	<i>Campylobacter</i> species	2	1	0	D	N	Lamb liver	Undercooking
SES53910	Feb	Restaurant	Ciguatera toxin	4	0	4	D	D	Grouper fish	N/A
HUN0512	Jun	Function	Norovirus	34	2	1	D	C	Unknown	Person contamination of ready-to-eat foods
HUN0514	Jul	Restaurant	Norovirus	12	1	0	D	N	Unknown	Unknown
HUN0515	Aug	Commercial caterer	Norovirus	32	2	1	A	C	Unknown	Unknown
SNSW57734	Dec	Restaurant	Norovirus	8	1	2	D	N	Unknown	Unknown
NSW201701	Jan	Cruise	<i>Salmonella</i> Enteritidis	10	10	0	D	N	Unknown	Unknown
NSW201702	Jan	Private residence	<i>Salmonella</i> Enteritidis	5	3	0	D	N	Unknown	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.

** Epi Study: C=Cohort study; CC=Case control study; D=Descriptive case series; N=Individual patient data not collected

PHU ID number	Month of onset	Setting	Pathogen	No. ill	Lab confirmed	No. hospitalised	Evidence*	Epi. Study**	Suspected / Responsible vehicle	Contributing factors
SES201704	Dec	Cruise	<i>Salmonella</i> Enteritidis	8	8	2	D	N	Unknown	Unknown
CC57453	Nov	Restaurant	<i>Salmonella</i> Singapore	3	3	0	D	N	Sandwich wraps	Unknown
CC201701	Jan	Restaurant	<i>Salmonella</i> Typhimurium MLVA 3-16-9-7-523	17	17	0	M	N	Multiple – eggs and cross contamination	Cross contamination and use of raw egg
SES201701	Jan	Picnic	<i>Salmonella</i> Typhimurium MLVA 3-17-9-12-523	9	2	2	D	N	French toast (with egg)	Unknown
SES54155	Mar	Restaurant	<i>Salmonella</i> Typhimurium MLVA 3-17-9-12-523	3	1	0	D	N	Unknown	Unknown
SES201702	Apr	Picnic	<i>Salmonella</i> Typhimurium MLVA 3-24-13-10-523	6	2	2	D	N	Unknown	Unknown
WS54202	Feb	Commercial caterer	<i>Salmonella</i> Wangata	10	2	1	A	C	Contaminated drinking water	Improper use of non-potable water
SES201703	Jun	Function	Unknown	48	0	0	A	C	Salads	Ill person contamination of ready-to-eat food

* 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

PHU ID number	Month of onset	Setting	Pathogen	No. ill	Lab confirmed	No. hospitalised	Evidence*	Epi. Study**	Suspected / Responsible vehicle	Contributing factors
SYD56362	Aug	Commercial caterer	Unknown	24	0	0	D	C	Sandwiches	Contamination of ready-to-eat foods
IS54600	Mar	Restaurant	Unknown	4	0	0	D	N	Curries	Improper hot holding temperatures
IS57055	Oct	Restaurant	Unknown	6	0	0	D	N	Unknown	Various significant procedural and hygiene issues
NS201704	Dec	Private residence	Unknown	4	0	0	D	D	Salad with tuna	Unknown
NS201701	Jan	Takeaway	Unknown	5	0	0	D	N	Unknown	Unknown
NS201702	Feb	Restaurant	Unknown	5	0	0	D	N	Unknown	Unknown
HUN0509	Feb	Restaurant	Unknown	6	0	0	D	N	Unknown	Unknown
SYD54561	Mar	Restaurant	Unknown	3	0	0	D	N	Unknown	Unknown
SYD54778	Apr	Restaurant	Unknown	3	0	0	D	N	Unknown	Unknown
LIV56141	Jul	Restaurant	Unknown	16	0	0	D	N	Unknown	Unknown
M55993	Jul	Restaurant	Unknown	6	0	0	D	N	Unknown	Unknown
SES56110	Jul	Restaurant	Unknown	32	0	0	D	N	Unknown	Unknown
SES56982	Sep	Restaurant	Unknown	13	0	0	D	N	Unknown	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.

** Epi Study: C=Cohort study; CC=Case control study; D=Descriptive case series; N=Individual patient data not collected

PHU ID number	Month of onset	Setting	Pathogen	No. ill	Lab confirmed	No. hospitalised	Evidence*	Epi. Study**	Suspected / Responsible vehicle	Contributing factors
HUN0517	Oct	Restaurant	Unknown	8	0	0	D	N	Unknown	Unknown
IS57141	Oct	Restaurant	Unknown	5	0	0	D	N	Unknown	Unknown
SES57228	Oct	Commercial caterer	Unknown	17	0	0	D	N	Unknown	Unknown
M57599	Nov	Restaurant	Unknown	20	0	1	D	N	Unknown	Unknown
SES57685	Nov	Restaurant	Unknown	8	0	0	D	N	Unknown	Unknown
WS57818	Dec	Restaurant	Unknown	9	0	0	D	N	Unknown	Unknown
SES54568	Mar	Restaurant	Unknown	5	0	0	D	N	Unknown	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.

** Epi Study: C=Cohort study; CC=Case control study; D=Descriptive case series; N=Individual patient data not collected

SIGNIFICANT ENTERIC OUTBREAKS 2017

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

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

Of the 51 cases from 1 December 2016 to 20 January 2017, 42 were confirmed outbreak cases with the same MLVA profile 3-16-9-7-523; nine were possible cases. Of 41 cases interviewed, 17 people reported eating at a Central Coast café and 13 consumed meals containing egg or egg products at the café.

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

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

The NSW Food Authority inspected the local egg producer from which the cafés sourced their eggs. Environmental samples isolated *Salmonella* Typhimurium. The NSW Food Authority worked closely with the egg producer to implement various practices on the farm to reduce the prevalence of *Salmonella* as part of the NSW *Salmonella* reduction strategy. The outbreak has been declared over, and the risk from this egg provider is believed to be contained.

Salmonella Wangata at a yoga retreat

In February, the NSW Food Authority received a complaint regarding gastrointestinal illness associated with attendance at a yoga retreat. Seventeen of the twenty attendees were interviewed by the local public health unit or responded to an online questionnaire. Of these, eight (47%) reported gastrointestinal illness with onset on the last day of the retreat (n=1) or shortly after the retreat (n=7). Two stool specimens were positive for *Salmonella* Wangata.

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

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

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

Campylobacter outbreak on a rural commune

On 4 April 2017, Hunter New England LHD was notified by a medical practitioner of cases of

gastrointestinal illness from a rural commune of approximately 120 adults and children.

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

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

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

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

Salmonella Singapore associated with two cafés in a shopping centre

On 8 and 9 November 2017, Communicable Diseases Branch received SMS responses from two *Salmonella* cases who reported eating at the same café. The cases were contacted as part of a project implemented in September 2017 where all *Salmonella* cases with mobile phone numbers are sent an SMS asking them about food venue exposures in the three days prior to their illness.

Both cases developed gastroenteritis symptoms including diarrhoea 4 to 12 hours after consuming pre-made chicken wraps at the same café on different days. A third case mentioned in an SMS that he consumed a chicken wrap in a different café in the same shopping centre. All three cases were typed as *Salmonella* Singapore.

Inspection of both cafés by local council revealed that they were owned by the same operator. Both kitchens were noted to be small and there was no sanitiser available. There were also minor issues relating to temperature control. Environmental samples were collected but were negative for all pathogens. Local council worked with the operator to rectify the operational and structural issues which are thought to have contributed to the *Salmonella* infections. There is no ongoing public health risk.

Campylobacter associated with a restaurant

On 20 December 2017, the NSW Food Authority received a complaint of gastrointestinal illness affecting two of a group of seven (29%) patrons at a restaurant.

The public health unit interviewed both unwell patrons, who reported developing bloody diarrhoea, vomiting, abdominal pain and fever 50 hours (range 41-60 hours) after the meal. The duration of symptoms was more than seven days. The two unwell patrons were from separate households. Both cases sought medical attention however, only one stool specimen was collected in which a *Campylobacter* species was isolated.

Both affected cases had consumed undercooked lamb's fry (liver). The other members of the group did not consume that dish, and remained well.

The NSW Food Authority advised the premise to withhold the lamb's fry from sale until inspection by the local council. No significant hygiene or food handling issues (including cooking of the lamb's fry) were reported at inspection by the local council. Based on epidemiological and laboratory investigations, it is thought that the cluster was caused by the consumption of undercooked lamb's fry, which may have been undercooked on this one occasion. There is no ongoing public health risk.

Recurrent *Salmonella* Enteritidis on a cruise ship

In early December 2017, a cluster of eight cases of *Salmonella* Enteritidis was reported in passengers on a cruise ship, travelling from Southeast Asia to Sydney. Of the eight cases, six were from NSW, one was from Victoria and one was from Queensland.

Seven cases from the outbreak were interviewed and eggs, chicken and fresh fruit were identified as common exposures. The NSW Food Authority and South Eastern Sydney Public Health Unit conducted a joint inspection of the vessel in Sydney. No concerns relating to food handling practices were found. A variety of locally and overseas sourced food samples were collected, all of which were negative for *Salmonella*.

This was the second *Salmonella* Enteritidis outbreak associated with this cruise ship, the first involving eleven cases on the same vessel and route from Southeast Asia to Sydney during the previous summer (December 2016).

Whole genome sequencing of all eight isolates from the second outbreak indicated they were

identical or closely related. These isolates were genetically distinct from the isolates in the first outbreak and are not thought to have been caused by the same food item. Analysis of the sequences from the two *Salmonella* Enteritidis outbreaks revealed that the isolates from the second outbreak were most closely related to isolates from cases unrelated to the cruise who had travelled to a particular South East Asian country, which was one of the countries where the vessel had brought on food items at port. The isolates were distinct from unrelated infections acquired in the countries of other ports where the ship had docked.

Based on epidemiological and laboratory investigations, it is thought that the cluster was likely caused by consumption of contaminated food items supplied from the implicated port at one or more of the restaurants on board the ship, however a food source was not able to be identified. These results have been communicated to the vessel operator, which is reviewing their food supply chains in that country.

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 2017

- Number of outbreaks: 921
- Number of people affected: 14,183
- Number of outbreaks with at least one stool sample collected: 357 (39%)

Overall trend (compared to 5 year average)

- 45% increase in the number of outbreaks
- 64% increase in the number of people affected

Seasonality

- Child care centres and hospitals: Peaked in August
- Aged care facilities: Peaked in September

Groups with highest frequency in 2017

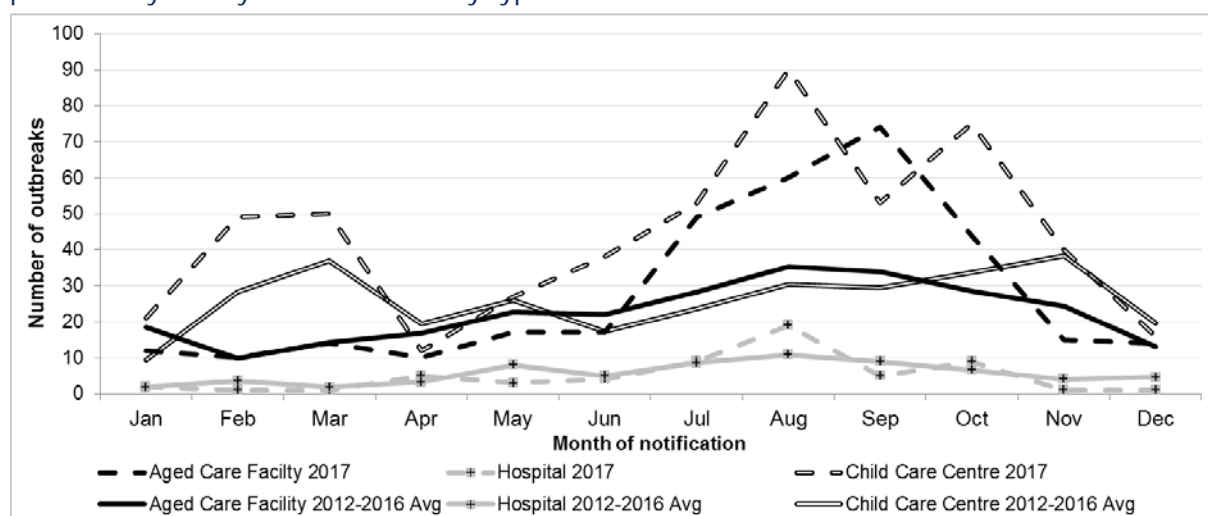
- Facility type: child care centres, 528 (57%) of outbreaks
- Attack rate in staff: child care centres at 14%
- Attack rate in non-staff: hospital patients at 29%
- Average duration of outbreaks: child care centres at 10 days

Causative agent

- Norovirus (laboratory confirmed): 19% of outbreaks (50% of outbreaks with a stool sample collected)

Note: only 39% of outbreaks had one or more stool samples collected

Number of reported outbreaks of gastrointestinal illness in institutions in 2017 and average of the previous 5 years by month and facility type



Characteristics of outbreaks of gastrointestinal illness in institutions reported to NSW in 2017

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	336	1394: 4%	5937: 21%	7	259: 77%	140: norovirus 18: rotavirus
Child care	528	1211: 14%	4937: 10%	10	60: 11%	11: norovirus 17: rotavirus
Hospital	36	181: 11%	290: 29%	8	29: 78%	22: norovirus
School	4	2: 1%	47: 8%	7	0: 0%	-
Other*	17	47: 5%	137: 9%	5	9: 53%	6: norovirus
TOTAL	921	2835: 19%	11348: 14%	9	357: 39%	179: norovirus 35: rotavirus

*Military facilities, camps, other 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: *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*ⁱ, *Salmonella* Paratyphi, *Salmonella* Typhi, *Listeria monocytogenes*, *Shigella*, HUS and STEC, *Cryptosporidium*, *Giardia*, *Campylobacter*, rotavirus and hepatitis A & E viruses.

ⁱ 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).

Methods continued

On 16 March 2018, 2017 data was extracted from NCIMS using Secure Analytics for Population Health Research and Intelligence (SAPHaRI)ⁱⁱ using the date of onset of disease. The counts of each notifiable enteric diseaseⁱⁱⁱ for 2017 were compared with the average annual count for the years 2012 to 2016. The NSW estimated resident population for 30 June of each year from 2012-2017 was used to calculate crude incidence rates for each disease.^{iv}

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

2012 and 31 December 2017, 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. Data were reported as received by Communicable Diseases Branch up to 1 April 2017.

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

ⁱⁱⁱ 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

^{iv} Australian Bureau of Statistics. Estimated resident populations based on 2011 Census counts and mid-series experimental population projections.

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- Dr Jeremy McAnulty, Director, Health Protection, NSW
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- The New South Wales Food Authority for management of environmental aspects of outbreak investigations
- Local Councils in NSW that contribute to enteric disease investigations
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