

OzFoodNet

Enhancing Foodborne Disease Surveillance Across Australia.

NSW ANNUAL REPORT

2015



Health
Communicable
Diseases

Produced by:

COMMUNICABLE DISEASES BRANCH

Health Protection NSW

Locked Mail Bag 961

North Sydney NSW 2059

Email: hprot@doh.health.nsw.gov.au

www.health.nsw.gov.au/infectious/pages/default.aspx

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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 2015, changes in notification since 2006-2014, and other activities in 2015. NSW Health undertakes surveillance of enteric diseases to monitor trends over time and identify outbreaks, with the aim of implementing control measures to prevent further illness within the community.

Cases of infection and incidence 2015

- Notifications of enteric conditions: 9,924
- Reported hospitalisations: 564
- Reported deaths: 7
- Notification rate per 100,000 population: 130.30

Notifications and reported hospitalisations due to enteric pathogens in NSW, 2015

	n	Notified Rate ¹	% change*	Reported Hospitalisation ¹	%
Salmonellosis	4016	52.7	13%	224	6%
Giardiasis	3431	45.1	45%	10	0%
Cryptosporidiosis	1047	13.8	79%	56	5%
Rotavirus	1040	13.7	-4%	88	8%
Shigellosis	171	2.3	18%	37	22%
Hepatitis A	67	0.9	2%	31	46%
Typhoid	42	0.6	-6%	33	79%
Shiga toxigenic E.Coli	30	0.4	70%	16	53%
Listeriosis	28	0.4	2%	27	96%
Hepatitis E	21	0.3	3%	13	62%
Paratyphoid	18	0.2	-37%	17	94%
Haemolytic uraemic syndrome	11	0.1	72%	11	100%
Botulism	1	0.01	-50%	1	100%
Cholera	1	0.01	-50%	0	0%
TOTAL	9924	130.3	25%	564	6%

*compared to 5 year average. ¹ incidence and hospitalisation may be underestimated as are limited to those reported to a public health unit.

Notable changes in 2015 (compared to 5 year average (2010-2014) unless indicated)

- 25% increase in the number of all enteric infections
- 13% increase in the number of salmonellosis notifications (p. 6-11)
- 70% increase in the number of Shiga toxigenic *Escherichia coli* (STEC) infections and 72% increase in haemolytic uraemic syndrome (HUS). 4 of the 11 HUS notifications in 2015 had evidence of a STEC infection (p. 18-19)
- 79% increase in cryptosporidiosis notification. In 2015, 48% indicated swimming pool exposure (p.20)
- 32% increase in the number of reported foodborne or probable foodborne disease outbreaks compared with 2014 (n=44). 58 foodborne or potentially foodborne disease outbreaks were reported affecting at least 569 people (p 29-38)

SALMONELLOSIS

Salmonellosis is caused by infection with bacteria called *Salmonella*. In Australia, most *Salmonella* infections occur after eating contaminated food or sometimes after contact with another person with the infection. Cases are usually only followed up if they are part of, or suspected to be part of, an outbreak.

Summary 2015

- Case Count: 4016
- Reported hospitalisations: 224
- Reported deaths: 2
- Notification rate per 100,000: 52.7

Overall trend:

- 8% increase in 2015 notification rate compared to 5 year average (48.6 per 100,000)
- However a 9% decrease from the peak NSW rate of 58.2 per 100,000 that was seen in 2014.

Seasonality

- Peaks in summer months

Groups with highest notification rate in 2015

- Age: <5 years (21% of cases - 169.4 per 100,000)
- Sex: Female (52% of cases - 55.0 per 100,000)
- LHD: Far West NSW (1% of cases - 100.5 per 100,000)

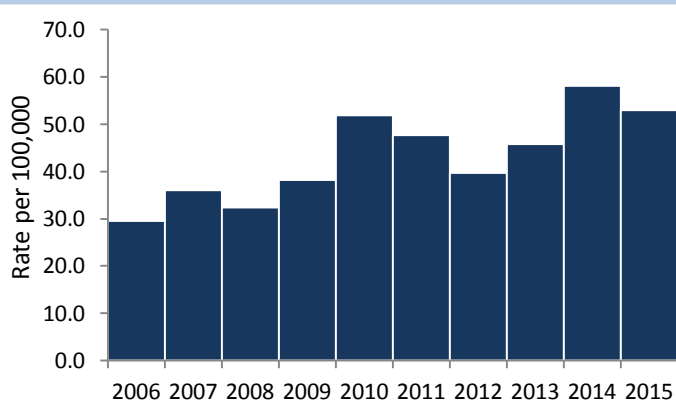
Top serotypes in 2015 - % change compared to 2014

1. Typhimurium (44% of cases)- ↓ 31%
2. Enteritidis (4% of cases) – no change
3. Saintpaul (3% of cases)- ↑ 176%
4. Paratyphi B bv java (3% of cases) - ↑ 24%
5. Wangata (3% of cases) - ↑ 22%

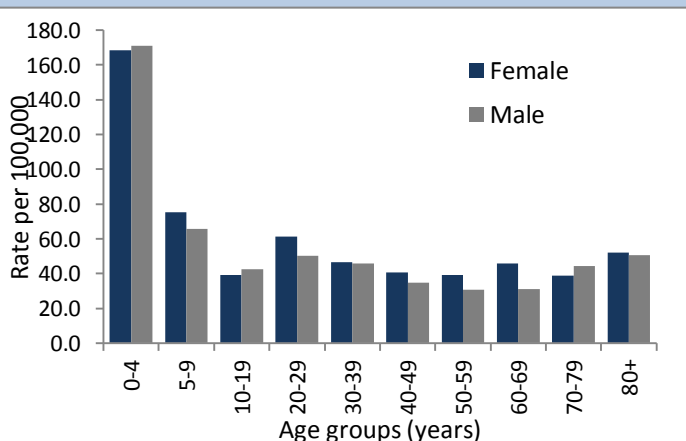
Outbreaks

- Cases found to be associated with an outbreak: 3.4% (p.29-38)

Notification rate per 100,000 population by year, 2006 – 2015, NSW



Notification rate per 100,000 population by age category and sex from 2015, NSW



Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

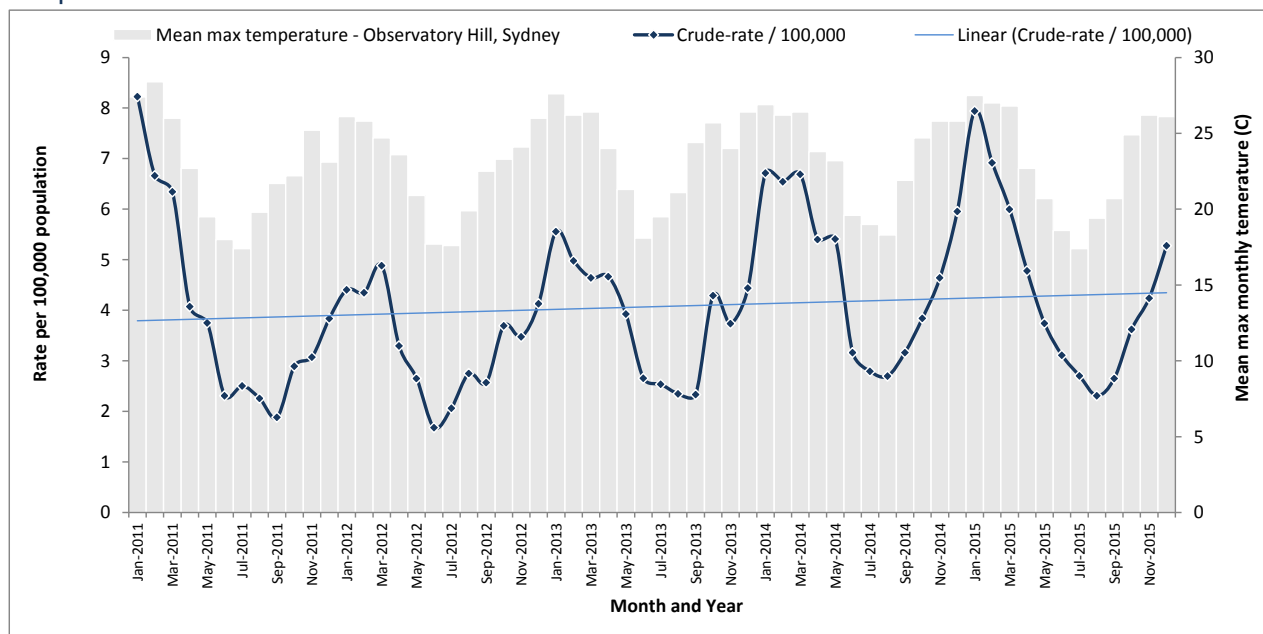
LHD	Count		Rate	
	5Yr mean	2015	5yr mean	2015
CC	151.6	133	46.6	39.8
FW	18.6	31	59.8	100.5
HNE	405.0	427	45.7	46.9
IS	146.6	213	37.7	53.3
M	150.2	139	63.0	57.8
MNC	130.4	137	62.4	63.8
NBM	145.4	177	41.2	48.2
NNSW	215.6	276	74.3	93.0
NS	499.0	584	57.5	64.8
SES	465.0	498	54.0	55.8
SNSW	79.6	111	40.1	54.2
SWS	392.8	409	44.1	43.4
SYD	303.4	353	51.1	56.6
WNSW	95.4	96	34.9	34.4
WS	363.4	432	41.9	46.6
NSW	3562.0	4016	48.6	52.7

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

Salmonella continued

Seasonality and temperature effects:

Crude monthly salmonellosis notification rate per 100,000 population and mean maximum monthly temperature* in NSW from 2011 – 2015.



*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 2015, compared to the 2010-2014 average, by age group.

Age Group	Count	2015		5 year average (2010-2014)		
		Count	% of all cases	Count	% of all cases	Rate
0-4 yrs	839	839	21%	808	23%	169.4
5-9 yrs	342	342	8%	311.2	9%	71.1
10-19 yrs	373	373	9%	387.2	11%	40.7
20-39 yrs	1090	1090	27%	921	26%	51.5
40-59 yrs	729	729	18%	576.4	16%	36.6
60+ yrs	684	684	17%	552.8	16%	42.3

Salmonella serotypes

Top 5 Salmonella serotypes in NSW from 2011-2015

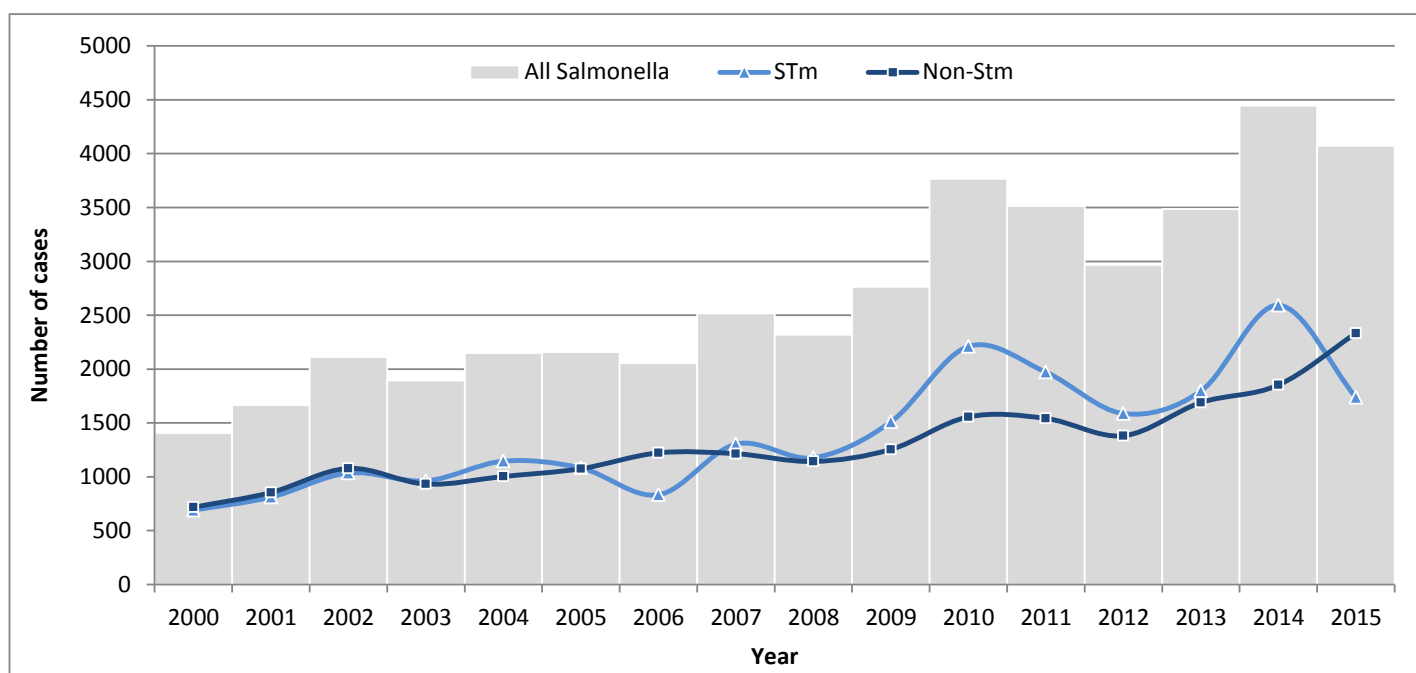
	2011	2012	2013	2014	2015
1	Typhimurium (1977)	Typhimurium (1596)	Typhimurium (1812)	Typhimurium (2547)	Typhimurium (1759)
2	Enteritidis (169)	Enteritidis (153)	Enteritidis (149)	Enteritidis (157)	Enteritidis (151)
3	Virchow (159)	Virchow (91)	Virchow (116)	Virchow (120)	Saintpaul (131)
4	Wangata (89)	Paratyphi B bv Java (84)	Paratyphi B bv Java (98)	Paratyphi B bv Java (98)	Paratyphi B bv Java (122)
5	Infantis (75)	Singapore (62)	Infantis (77)	Wangata (88)	Wangata (107)

Salmonella continued

Salmonella Typhimurium trends

In 2015 *S. Typhimurium* infection notifications decreased by 31% when compared to 2014. The NSW Food Authority has a focus on reducing *S. Typhimurium* and may account for some of the decrease in 2015.

Number of *S. Typhimurium* and non *S. Typhimurium* infections in NSW from 2000-2015



S.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 and number of isolates from 2011-2015, NSW*

	2011	2012	2013	2014	2015
1	3-9-7-13-523 (259)	3-17-9-12-523 (150)	3-17-9-12-523 (159)	3-17-9-11-523 (210)	3-12-11-14-523 (100)
2	3-10-8-9-523 (149)	3-9-8-13-523 (124)	3-9-8-13-523 (83)	3-12-11-14-523 (149)	3-17-9-11-523 (91)
3	3-9-8-13-523 (113)	3-9-7-13-523 (100)	3-9-7-13-523 (74)	3-12-12-9-523 (141)	3-12-12-9-523 (82)
4	3-9-7-14-523 (92)	3-16-9-12-523 (66)	3-10-14-12-496 (61)	3-10-7-12-523 (99)	3-12-13-9-523 (54)
5	3-12-9-10-550 (76)	3-10-8-9-523 (50)	3-10-7-14-523 (55)	3-9-7-12-523 (98)	3-24-13-10-523 (53)
6	3-9-7-15-523 (59)	3-9-8-12-523 (38)	3-13-11-9-523 (48)	3-9-8-12-523 (97)	3-10-8-12-523 (42)
7	3-14-11-12-523 (50)	3-9-8-14-523 (38)	3-9-7-14-523 (45)	3-16-9-11-523 (94)	3-9-7-12-523 (40)
8	3-10-14-12-496 (48)	3-9-9-13-523 (37)	3-23-23-11-523 (43)	3-17-10-11-523 (94)	3-17-8-11-523 (39)
9	3-12-15-13-523 (46)	3-9-9-12-523 (34)	3-10-8-9-523 (39)	3-10-13-11-496 (52)	3-16-9-11-523 (37)
10	3-13-11-9-523 (30)	3-12-11-13-523 (29)	3-17-9-11-523 (39)	3-16-9-12-523 (50)	3-24-14-10-523 (33)

*Colour code indicates closely related MLVA patterns.

Salmonella Enteritidis infection

While *S. Enteritidis* is endemic in commercial poultry farms in most countries, it is not endemic in Australia, as such most NSW cases are acquired overseas. All cases of *S. Enteritidis* are followed up in NSW to ensure any possible local acquisition is investigated.

Summary 2015

- Case count: 151
- Reported hospitalisations: 16
- Reported deaths: 0
- Notification rate per 100,000: 2.0

Overall trend:

- 6% decrease in 2015 notification rate compared to 5 year average (2.1 per 100,000)

Groups with highest notification rate in 2015

- Age: <5 years (16% - 4.8 per 100,000)
- Sex: Female (53% - 2.1 per 100,000)
- LHD: South Eastern Sydney (24 % - 4.0 per 100,000)

Seasonality

- Peaks typically in summer months

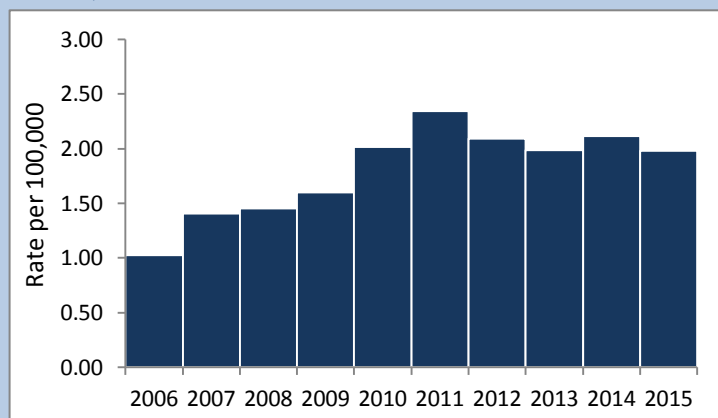
Place of acquisition in 2015

- In NSW: 8%
- Overseas 77%
- Unknown: 15%

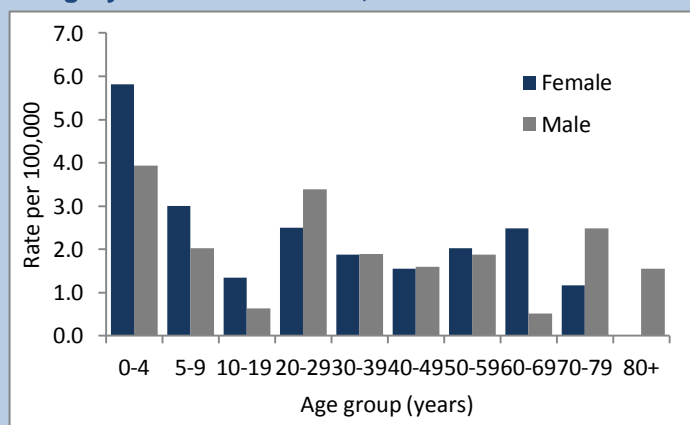
Outbreaks

- Cases found to be associated with an outbreak: 0%

Notification rate per 100,000 population, by year, 2006 – 2015, NSW



Notification rate per 100,000 population by age category and sex from 2015, NSW



Number of cases and rate (per 100,000) by Local Health District, 2015, NSW

LHD	Count		Rate	
	5Yr mean	2015	5yr mean	2015
CC	8.0	5	2.5	1.5
FW	0.6	0	1.9	0.0
HNE	18.8	20	2.1	2.2
IS	6.8	13	1.8	3.3
M	1.6	3	0.7	1.2
MNC	3.8	3	1.8	1.4
NBM	2.6	8	0.7	1.2
NNSW	8.6	7	3.0	2.4
NS	28.0	20	3.2	2.2
SES	30.6	36	3.6	4.0
SNSW	5.2	3	2.6	1.5
SWS	13.0	7	1.5	0.7
SYD	13.6	14	2.3	2.2
WNSW	3.0	4	1.1	1.4
WS	10.2	8	1.2	1.4
NSW	154.4	151	2.1	2.0

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

Place of acquisition

Number of cases and rate of S.Enteritidis notifications by place of acquisition and year, 2010-2015, NSW.

Year	Count		Rate (per 100,000)	
	Acquired in NSW	Acquired outside NSW	Acquired in NSW	Acquired outside NSW
2010	12	132	0.2	1.9
2011	23	146	0.3	2.0
2012	7	146	0.1	2.0
2013	11	136	0.2	1.8
2014	4	155	0.1	2.1
2015	12	139	0.2	1.8

Salmonella Paratyphi B var Java infection

All *S. Paratyphi* bioser Java cases followed up 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 *S. Paratyphi* bioser Java organisms).

Summary 2015

- Case count: 122
- Reported hospitalisations: 28
- Reported deaths: 0
- Notification rate per 100,000: 1.6

Overall trend:

- 36% increase in 2015 notification rate compared to 5 year average (1.2 per 100,000)

Groups with highest notification rate in 2015

- Age: <5 years (39% - 9.7 per 100,000)
- Sex: Male (52% - 1.7 per 100,000)
- LHD: Northern Sydney (47% - 6.2 per 100,000)

Place of acquisition in 2015

- In NSW: 49%
- In Australia & outside NSW: 0%
- Overseas 29%

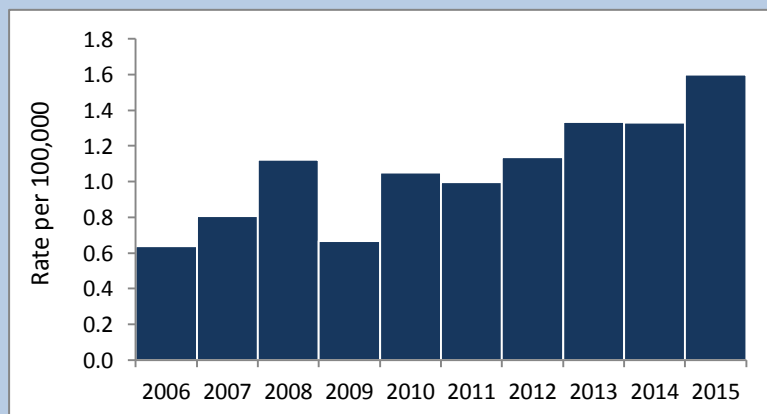
(note: data available on 78% of cases)

Outbreaks

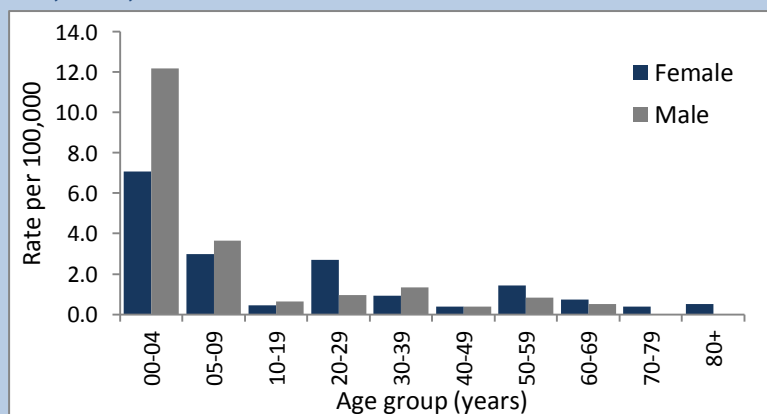
- Cases found to be associated with an outbreak: 0%

Note: NSLHD continues to investigate the relationship between Paratyphi B var java infections in preschool children due to sandpit contaminated by local native fauna.

Notification rate per 100,000 population by year, 2006 – 2015, NSW



Notification rate per 100,000 population by age category and sex, 2015, NSW



Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5yr mean	2015
CC	3.4	4	1.0	1.2
FW	1.0	0	3.2	0.0
HNE	6.6	8	0.7	0.9
IS	3.4	5	0.9	1.3
M	1.3	0	0.5	0.0
MNC	1.5	3	0.7	1.4
NBM	3.8	8	1.1	2.2
NNSW	1.5	3	0.5	1.0
NS	36.6	57	4.2	6.2
SES	10.2	7	1.2	0.8
SNSW	1.7	1	0.8	0.5
SWS	4.6	9	0.5	1.0
SYD	5.2	8	0.9	1.3
WNSW	2.0	2	0.7	0.7
WS	6.8	7	0.8	0.8
NSW	85.8	122	1.2	1.6

* 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 eating contaminated food or water while visiting countries where it is endemic. All cases of typhoid and paratyphoid are followed up in NSW.

Summary 2015

- Case Count: 60
- Reported Hospitalisations: 50
- Reported Deaths: 0
- Notification rate per 100,000: 0.8

Overall trend:

- 21% decrease in 2015 notification rate compared to 5 year average (1.0 per 100,000)

Groups with highest notification rate in 2015

- Age: <5 years (17% - 2 per 100,000)
- Sex: Female (58% - 0.9 per 100,000)
- LHD: Western Sydney (43% - 2.8 per 100,000)

Seasonality

- Peaks typically in summer months

Place of acquisition in 2015

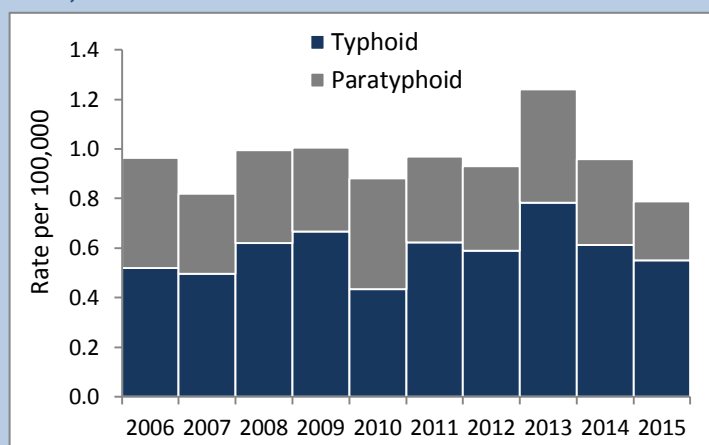
- In NSW: 0%
- In Australia & outside NSW: 0%
- Overseas: 100%
- Unknown: 0%

(note: data available on 100% of cases)

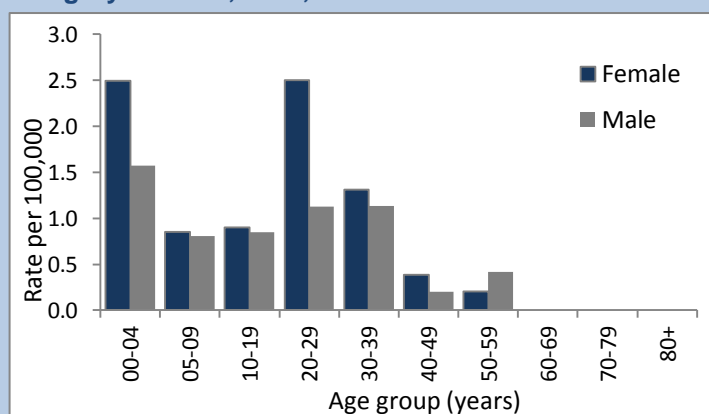
Outbreaks

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

Notification rate per 100,000 population by year, 2006 – 2015, NSW



Notification rate per 100,000 population by age category and sex, 2015, NSW



Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5Yr mean	2015
CC	0.2	0	0.1	0.0
FW	0.0	0	0.0	0.0
HNE	1.6	2	0.2	0.2
IS	1.4	0	0.4	0.0
M	0.8	1	0.3	0.4
MNC	0.6	0	0.3	0.0
NBM	1.4	1	0.4	0.3
NNSW	1.0	0	0.3	0.0
NS	8.4	7	1.0	0.8
SES	13.4	7	1.6	0.8
SNSW	0.8	1	0.4	0.5
SWS	11.6	7	1.3	0.7
SYD	10.2	8	1.7	1.3
WNSW	0.2	0	0.1	0.0
WS	21.4	26	2.5	2.8
NSW	73.0	60	1.0	0.8

* 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, 2015

County of acquisition	Paratyphoid	Typhoid	Total
India	6	23	29
Bangladesh	1	4	5
Indonesia	2	3	5
Nepal	3	1	4
Pakistan	1	2	3
Thailand	1	2	3
Lebanon	0	2	2
Philippines	0	2	2
Colombia	1	0	1
Myanmar, The Republic of the Union of	1	0	1
Papua New Guinea	0	1	1
Samoa	0	1	1
Unknown	2	1	3
Total	18	42	60

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 followed up in NSW to determine if the infection was acquired overseas or from local sources. Shigellosis can be spread person-to-person or via contaminated food.

Summary 2015

- Case count: 171
- Reported hospitalisations: 37
- Reported deaths: 0
- Notification rate per 100,000: 2.3

Overall trend:

- 14% increase in 2015 notification rate compared to 5 year average (2.0 per 100,000)
- Increased use of more sensitive tests may account for some of the increase in notifications

Groups with highest notification rate in 2015

- Age: 30-39 years (24% - 3.9 per 100,000)
- Sex: Male (61% - 2.8 per 100,000)
- LHD: Sydney (19% - 5.3 per 100,000) and South Eastern Sydney (27% - 5.2 per 100,000)

Place of acquisition in 2015

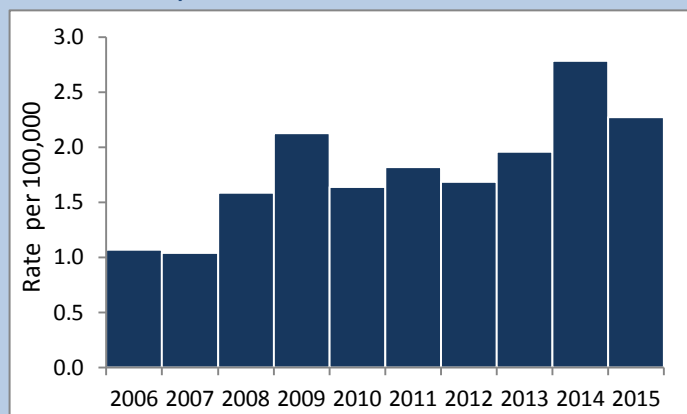
- In NSW: 38%
- In Australia & outside NSW: 5%
- Overseas: 48%
- Unknown: 9%

(note: data available on 100% of cases)

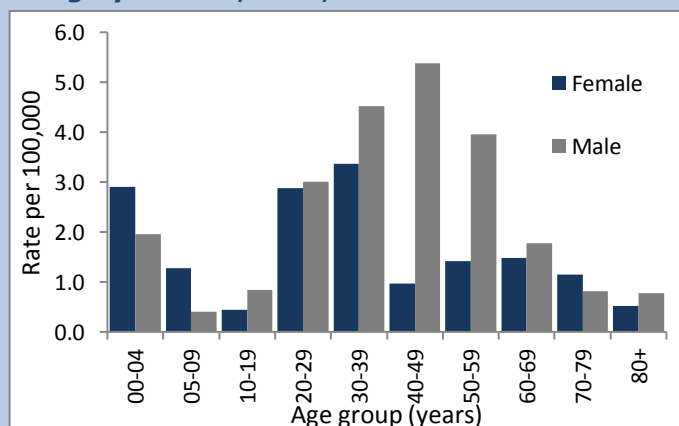
Risk exposures (locally acquired)

- Men who have sex with men (MSM): 47%
- Household contact: 3%
- Unknown: 50%

Notification rate per 100,000 population by year, 2006 – 2015, NSW



Notification rate per 100,000 population by age category and sex, 2015, NSW



Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5Yr mean	2015
CC	4.2	7	1.3	2.1
FW	0.4	0	1.3	0.0
HNE	4.8	10	0.5	1.1
IS	4.6	7	1.2	1.8
M	1	4	0.4	1.7
MNC	2.6	1	1.2	0.5
NBM	4	3	1.1	0.8
NNSW	7.8	2	2.7	0.7
NS	18	24	2.1	2.7
SES	41.8	48	4.8	5.2
SNSW	2	2	1.0	1.0
SWS	10.4	12	1.2	1.3
SYD	30.4	33	5.1	5.3
WNSW	2.4	1	0.9	0.4
WS	10.6	19	1.2	2.1
NSW	145	173	2.0	2.3

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

Shigellosis continued

Place where infection acquired

Place of acquisition for shigellosis 2010-2015, NSW

Place of acquisition	2010	2011	2012	2013	2014	2015
Acquired in NSW	42	40	25	53	112	63
Acquired in Australia outside NSW	0	1	2	2	4	9
Acquired overseas	30	50	70	64	49	78
Unknown	45	40	26	26	44	21
Total	117	131	123	145	209	171

Reported risk exposures for those infections acquired in Australia

Reported risk exposure for shigellosis cases with no travel history, 2011*-2015, NSW

Reported risk exposure	2011	2012	2013	2014	2015
Men who have sex with men (MSM)	24	9	29	68	34
Household contact	1	6	0	1	2
Unknown	16	15	33	37	36
Total	41	30	62	106	72

*all individual shigellosis notifications were not followed up until 2011 in NSW

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 people with weakened immune systems. All cases of listeriosis are followed up in NSW.

Summary 2015

- Case count: 28
- Reported hospitalisations: 27
- Reported deaths: 3
- Notification rate per 100,000: 0.4
- Perinatal cases: 1

Overall trend:

- 2015 notification rate remained steady compared to 5 year average (0.4 per 100,000)

Groups with highest notification rate in 2015

- Age: 80+ years (25% - 2.2 per 100,000)
- Sex: Male (79% - 0.6 per 100,000)
- LHD: Southern NSW (11% - 1.5 per 100,000)

Place of acquisition in 2015

- In NSW: 83%
- In Australia & outside NSW: 0%
- Overseas: 4%
- Unknown: 13%

(note: data available on 86% of cases)

Most common comorbidities

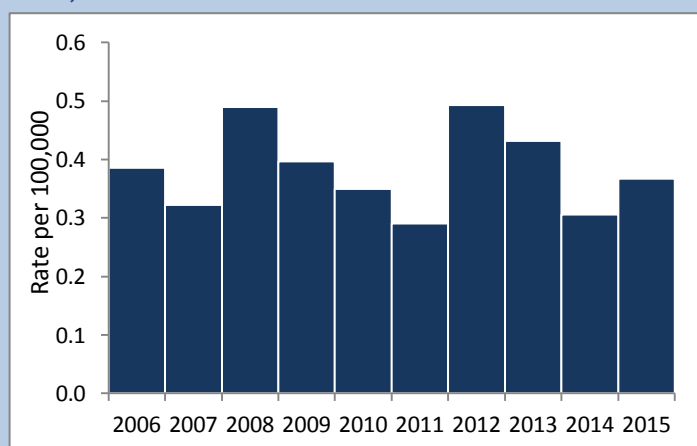
- Heart Disease: 7
- Cancer: 7

(note: data available on 96% of cases)

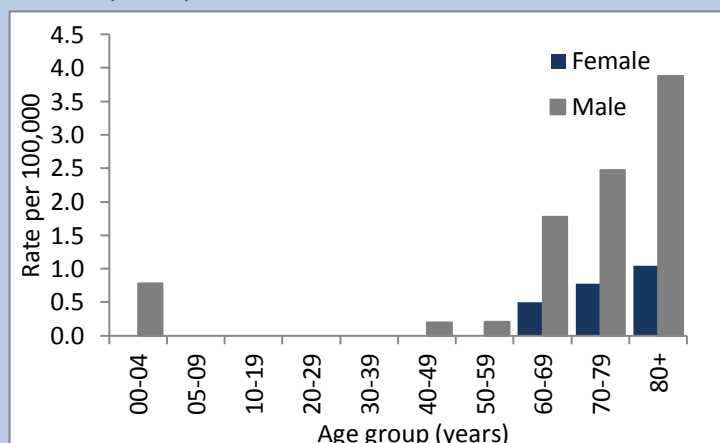
Pregnancy

- One case: Born at full term, child survived.

Notification rate per 100,000 population by year, 2006 – 2015, NSW



Notification rate per 100,000 population by age category and sex, 2015, NSW



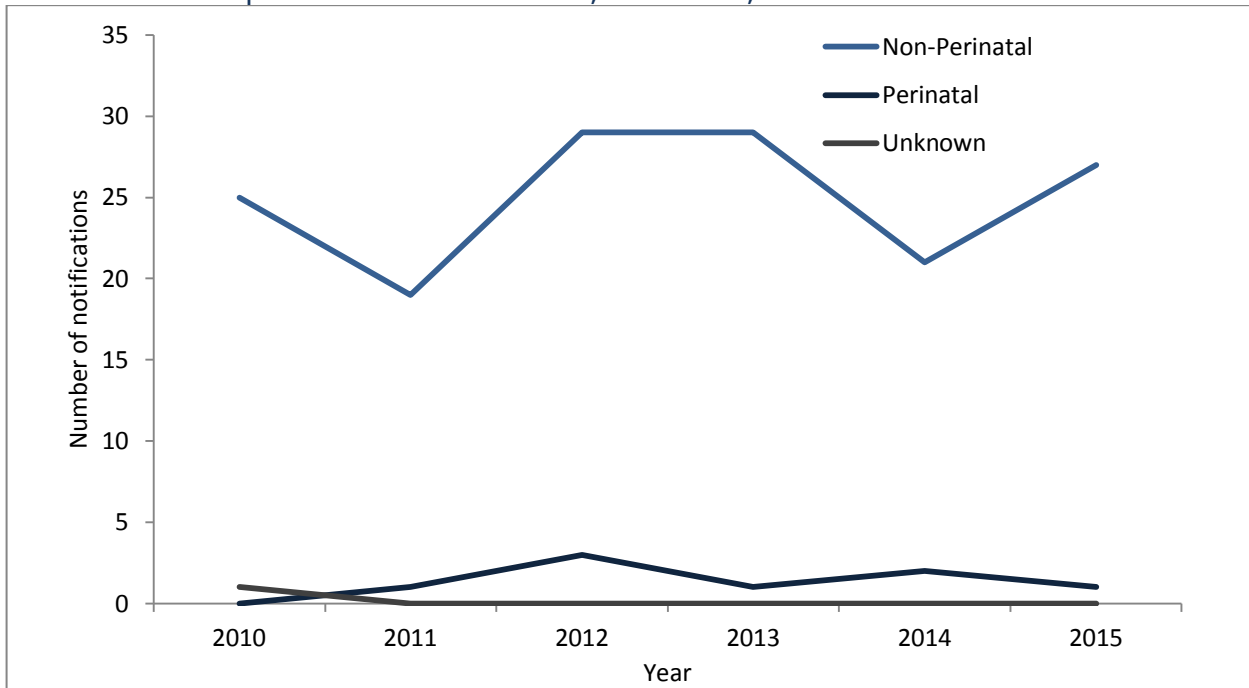
Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5Yr mean	2015
CC	1.2	0	0.4	0.0
FW	0.2	0	0.6	0.0
HNE	2.2	3	0.2	0.3
IS	2	0	0.6	0.0
M	0.6	1	0.3	0.4
MNC	0.2	1	0.1	0.5
NBM	0.8	1	0.2	0.3
NNSW	0.8	0	0.3	0.0
NS	4.6	4	0.5	0.4
SES	5	3	0.6	0.3
SNSW	0.6	3	0.3	1.5
SWS	3.6	7	0.4	0.7
SYD	1.6	3	0.3	0.5
WNSW	0.2	2	0.1	0.7
WS	3.2	0	0.4	0.0
NSW	27	28	0.4	0.4

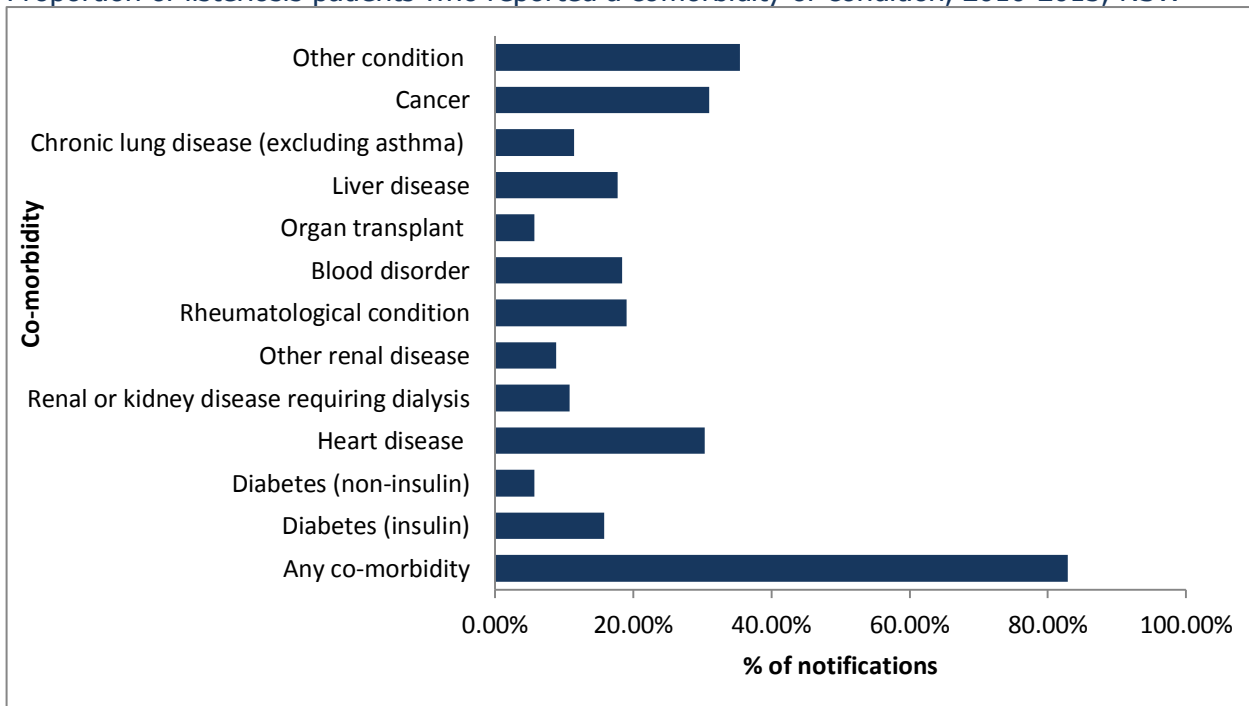
* grey shading – >50% increase compared to 5yr mean

Listeriosis continued

Perinatal and non-perinatal notified listeriosis, 2010-2015, NSW



Proportion of listeriosis patients who reported a comorbidity or condition, 2010-2015, NSW



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

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 cases of STEC infection are followed up in NSW.

Summary 2015

- Case count: 30
- Reported hospitalisations: 16
- Reported deaths: 0
- Notification rate per 100,000: 0.4

Overall trend:

- 100% increase in 2015 notification rate compared to 5 year average (0.2 per 100,000)
- The introduction of a more sensitive test may account for some of the increase in notifications

Groups with highest notification rate in 2015

- Age: <5 years (20% - 1.2 per 100,000)
- Sex: Female (50% - 0.4 per 100,000)
- LHD: Far West (3%* - 3.2 per 100,000) *A single case

Seasonality

- Peaks in summer months

Place of acquisition in 2015

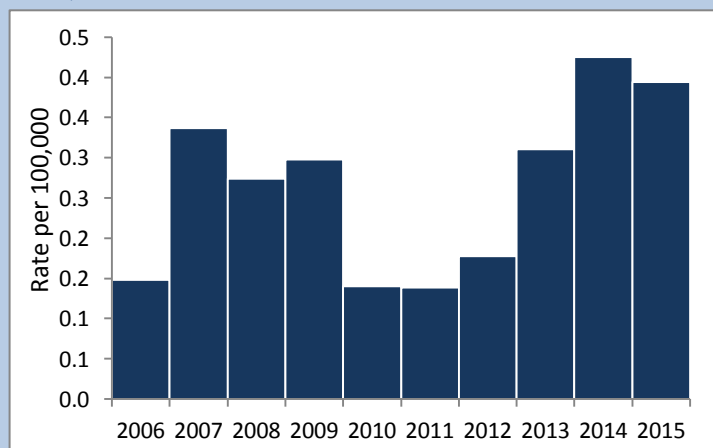
- In NSW: 74%
- In Australia & outside NSW: 0%
- Overseas: 15%
- Unknown: 11%

(note: data available on 90% of cases)

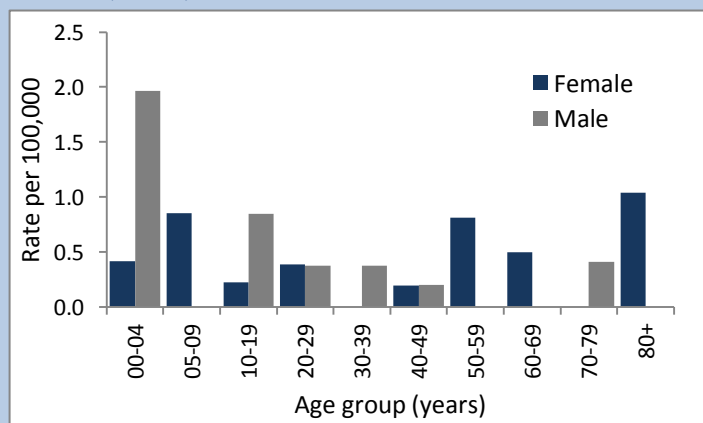
Risk exposures (locally acquired)

- Restaurant during incubation: 78%
- Ate beef during incubation: 69%
- Animal contact: 47%
- Farm exposure: 44%

Notification rate per 100,000 population by year, 2006 – 2015, NSW



Notification rate per 100,000 population by age category and sex, 2015, NSW



Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5Yr mean	2015
CC	0.2	0	0.1	0.0
FW	0	1	0.0	3.2
HNE	7.2	5	0.8	0.5
IS	1.2	2	0.3	0.5
M	1.2	1	0.5	0.4
MNC	0	2	0.0	0.9
NBM	0.6	0	0.2	0.0
NNSW	1.2	2	0.4	0.7
NS	0.2	2	0.0	0.2
SES	2.4	3	0.3	0.3
SNSW	0.8	5	0.4	2.4
SWS	1.2	1	0.1	0.1
SYD	0.6	2	0.1	0.3
WNSW	0.6	2	0.2	0.7
WS	0.2	2	0.0	0.2
NSW	17.6	30	0.2	0.4

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

HAEMOLYTIC UREMIC 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 cases of HUS are followed up in NSW.

Summary 2015

- Case count: 11
- Reported hospitalisations: 11
- Reported deaths: 0
- Notification rate per 100,000: 0.14

Overall trend:

- 66% increase in 2015 notification rate compared to 5 year average (0.09 per 100,000)

Groups with highest notification rate in 2015

- Age: <5 years (20% - 1.2 per 100,000)
- Sex: Female (55% - 0.2 per 100,000)
- LHD: Far West (9%* - 3.2 per 100,000) ^{*A single case}

Seasonality

- Peaks in summer months

Place of acquisition in 2015

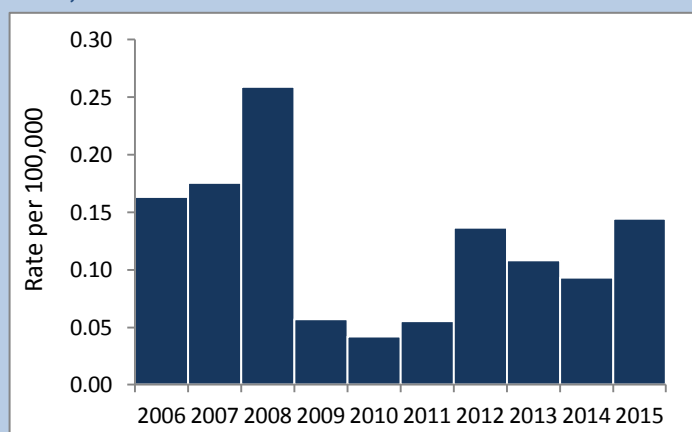
- In NSW: 74%
- In Australia & outside NSW: 0%
- Overseas: 15%
- Unknown: 11%

(note: data available on 90% of cases)

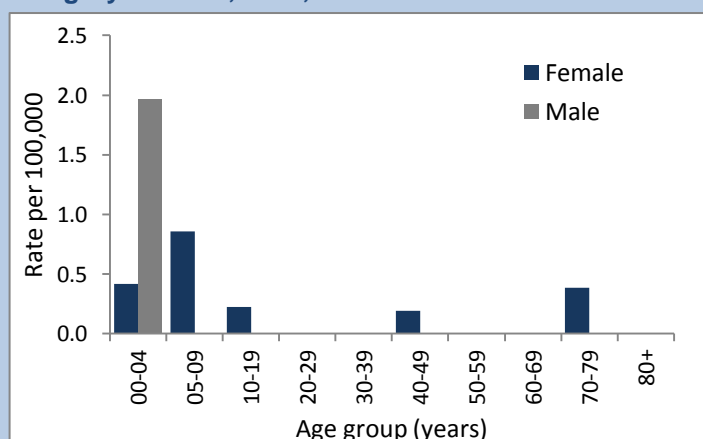
Bacterial infection

- In 4 cases STEC infection was identified (serogroups 0111 and 026).

Notification rate per 100,000 population by year, 2006 – 2015, NSW



Notification rate per 100,000 population by age category and sex, 2015, NSW



Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5Yr mean	2015
CC	0.0	0	0.0	0.0
FW	0.0	1	0.0	3.2
HNE	0.8	0	0.1	0.0
IS	0.4	1	0.1	0.3
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	0.8	2	0.1	0.2
SES	0.8	1	0.1	0.1
SNSW	0.6	0	0.3	0.0
SWS	0.8	2	0.1	0.2
SYD	0.4	1	0.1	0.2
WNSW	0.4	2	0.1	0.7
WS	0.2	1	0.0	0.1
NSW	6.4	11	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 stomach cramps. Not all cases are followed up in NSW. Environmental health officers are informed when public recreational water sources are identified as potential sources of infection.

Summary 2015

- Case count: 1047
- Reported hospitalisations: 56
- Reported deaths: 0
- Notification rate per 100,000: 13.8

Overall trend:

- 73% increase in 2015 notification rate compared to 5 year average (8.0 per 100,000)
- Increased use of a more sensitive tests may account for some of the increase in notifications

Groups with highest notification rate in 2015

- Age: <5 years (32% - 67.5 per 100,000)
- Sex: Male (51% - 14.1 per 100,000)
- LHD: Murrumbidgee (6% - 24.1 per 100,000)

Seasonality

- Peaks in summer months

Place of acquisition in 2015

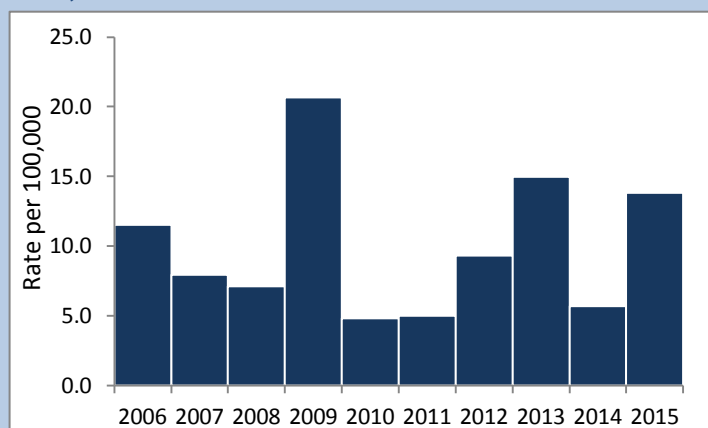
- In NSW: 75%
- In Australia & outside NSW: 3%
- Overseas: 12%
- Unknown: 10%

(note: data available on 59% of cases)

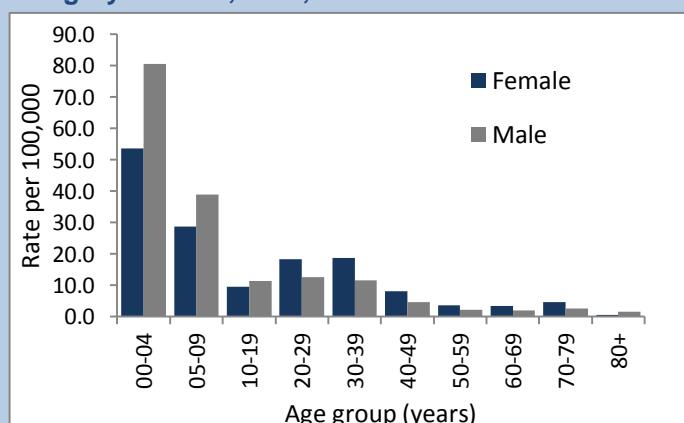
Possible risk exposures (locally acquired)

- Domestic animal exposure: 50%
- Swimming pool: 48%
- Farm animal exposure: 17%
- Tank water: 17%

Notification rate per 100,000 population by year, 2006 – 2015, NSW



Notification rate per 100,000 population by age category and sex, 2015, NSW



Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5Yr mean	2015
CC	20.4	31	6.3	9.3
FW	1.2	1	3.9	3.2
HNE	79.0	181	8.9	19.9
IS	24.2	69	6.2	17.3
M	20.2	58	8.5	24.1
MNC	16.2	24	7.8	11.2
NBM	28.2	48	8.0	13.1
NNSW	31.8	54	10.9	18.2
NS	100.4	101	11.6	11.2
SES	85.8	165	9.9	18.5
SNSW	11.4	24	5.7	11.7
SWS	30.6	52	3.4	5.5
SYD	51.6	87	8.7	14.0
WNSW	32.0	60	11.6	21.5
WS	51.6	92	5.9	9.9
NSW	584.6	1047	8.0	13.8

* 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. Cases of giardiasis are not routinely followed up in NSW.

Summary 2015

- Case count: 3431
- Reported hospitalisations: 10
- Reported deaths: 0
- Notification rate per 100,000: 45.4

Groups with highest notification rate in 2015

- Age: <5 years (26% - 170.4 per 100,000)
- Sex: Male (52% - 47.5 per 100,000)
- LHD: Northern Sydney (18% - 67.9 per 100,000)

Overall trend:

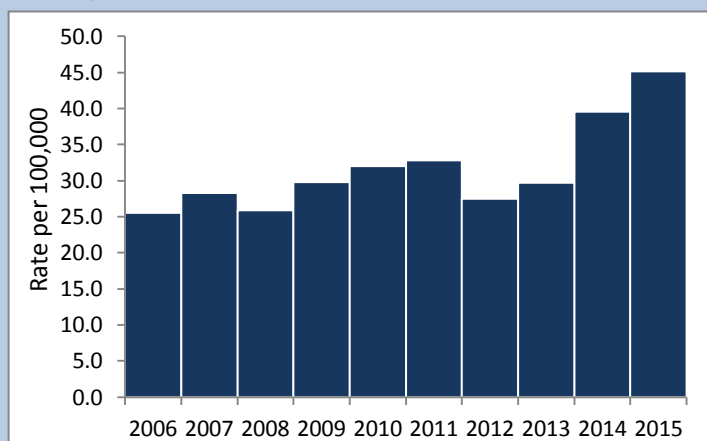
- 31% increase in 2015 notification rate compared to 5 year average (34.7 per 100,000)
- Increased use of more sensitive tests may account for some of the increase in notifications

Seasonality

- Peaks in summer months

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

Notification rate per 100,000 population by year, 2006 – 2015, NSW

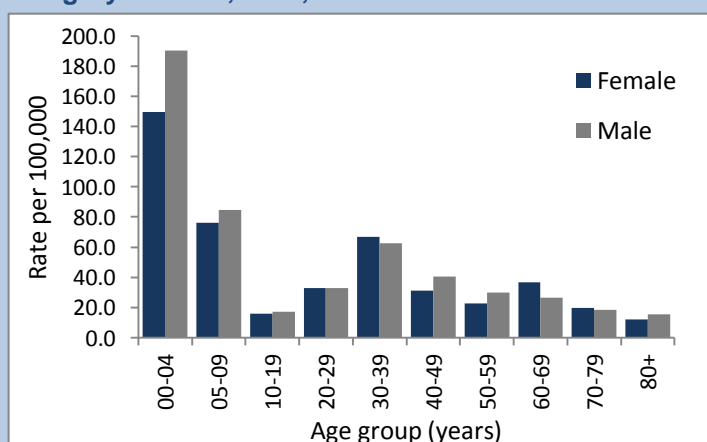


Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5Yr mean	2015
CC	88.0	132	29.1	39.5
FW	6.8	4	20.4	13.0
HNE	291.4	420	35.1	46.1
IS	126.6	253	37.6	63.3
M	74.0	128	34.7	53.3
MNC	46.6	73	24.2	34.0
NBM	123.6	154	36.2	41.9
NNSW	38.2	121	17.7	40.8
NS	397.0	612	49.5	67.9
SES	442.8	594	54.0	66.5
SNSW	53.0	60	27.1	29.3
SWS	150.8	199	17.6	21.1
SYD	215.8	290	38.1	46.5
WNSW	113.4	139	42.8	49.9
WS	198.8	252	23.6	27.2
NSW	2366.8	3431	34.7	45.4

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

Notification rate per 100,000 population by age category and sex, 2015, NSW



HEPATITIS A INFECTION

Hepatitis A is a viral infection of the liver. The virus is 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 A infection are followed up in NSW.

Summary 2015

- Case count: 67
- Reported hospitalisations: 30
- Reported deaths: 0
- Notification rate per 100,000: 0.9

Overall trend:

- In 2015 the notification rate remained steady compared to 5 year average (0.9 per 100,000)

Groups with highest notification rate in 2015

- Age: 20-29 years (25% - 1.6 per 100,000)
- Sex: Male (51% - 4 per 100,000)
- LHD: Western NSW (8% - 1.8 per 100,000)

Seasonality

- Peaks in summer months

Place of acquisition in 2015

- In NSW: 37%
- In Australia & outside NSW: 0%
- Overseas: 60%
- Unknown: 3%

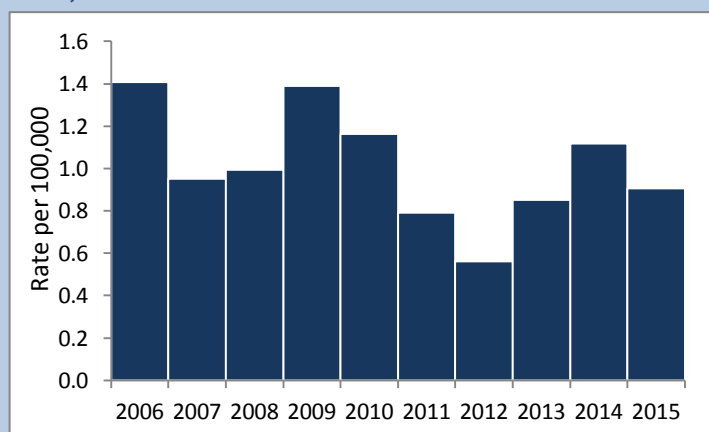
(note: data available on 100% of cases)

Outbreaks

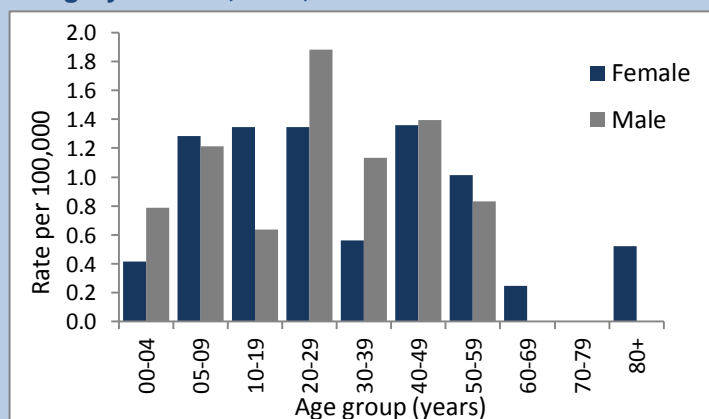
- Cases associated with an outbreak: 17 (25%)

(note: see foodborne outbreak section for details)

Notification rate per 100,000 population by year, 2006 – 2015, NSW



Notification rate per 100,000 population by age category and sex, 2015, NSW



Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5Yr mean	2015
CC	1.4	1	0.4	0.3
FW	0.2	0	0.6	0.0
HNE	2.8	3	0.3	0.3
IS	1.2	3	0.3	0.8
M	0.6	0	0.3	0.0
MNC	0.6	1	0.3	0.5
NBM	1.2	3	0.3	0.8
NNSW	2.8	0	1.0	0.0
NS	5.8	5	0.7	0.6
SES	10.6	4	1.2	0.4
SNSW	1.0	0	0.5	0.0
SWS	8.4	14	0.9	1.5
SYD	7.4	6	1.2	1.0
WNSW	1.2	5	0.4	1.8
WS	20.4	22	2.4	2.4
NSW	65.6	67	0.9	0.9

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

Hepatitis A continued

Place where infection was acquired

Hepatitis A notifications by place of acquisition, 2015 compared to the previous 5 year average, NSW.

Place of acquisition	5 year average		2015	
	Count	%	Count	%
Acquired in Australia outside NSW	0.6	1%	0	0%
Acquired in NSW	14	21%	25	37%
Acquired outside Australia	50	76%	40	60%
Unknown	1	2%	2	3%
Total	65.6	100%	67	100%

Country where infection was acquired

Hepatitis A notifications by country of acquisition, 2015 compared to the previous 5 year average, NSW.

Country of acquisition	5 year average		2015	
	Count	%	Count	%
Australia	14.6	22%	25	37%
India	9	14%	10	15%
Fiji	6	9%	5	7%
Pakistan	4.2	6%	5	7%
Philippines	4.4	7%	5	7%
Unknown	1	2%	2	3%
Bangladesh	1.8	3%	2	3%
Cambodia	0	0%	2	3%
Papua New Guinea	0.4	1%	2	3%
Korea, Republic of (South)	0.6	1%	1	1%
Other	23.2	35%	8	12%
Total	65.6	100%	67	100%

HEPATITIS E INFECTION

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

Summary 2015

- Case count: 21
- Reported hospitalisations: 13
- Reported deaths: 1
- Notification rate per 100,000: 0.3

Place of acquisition in 2015

- In NSW: 24%
- In Australia & outside NSW: 0%
- Overseas: 76%
- Unknown: 0%

(note: data available on 100% of cases)

Overall trend:

- In 2015, the notification rate remained steady compared to 5 year average (0.3 per 100,000)

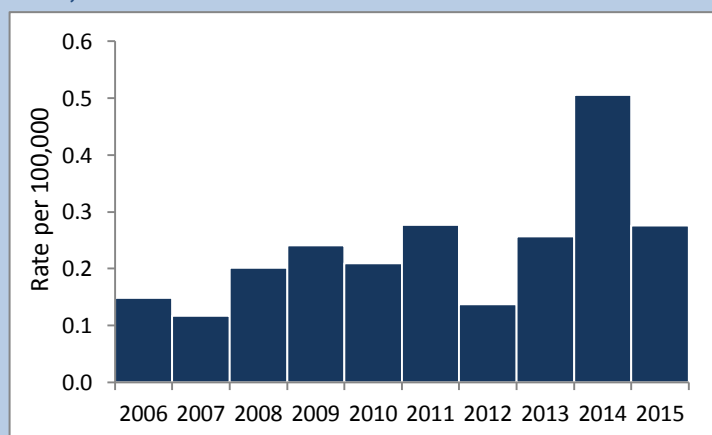
Groups with highest notification rate in 2015

- Age: 60-69 years (33% - 0.9 per 100,000)
- Sex: Female (52% - 0.3 per 100,000)
- LHD: Western Sydney (43% - 1.0 per 100,000)

Possible risk exposures (locally acquired)

- Pork consumption: 80%
- Seafood consumption: 60%
- Unknown: 20%

Notification rate per 100,000 population by year, 2006 – 2015, NSW

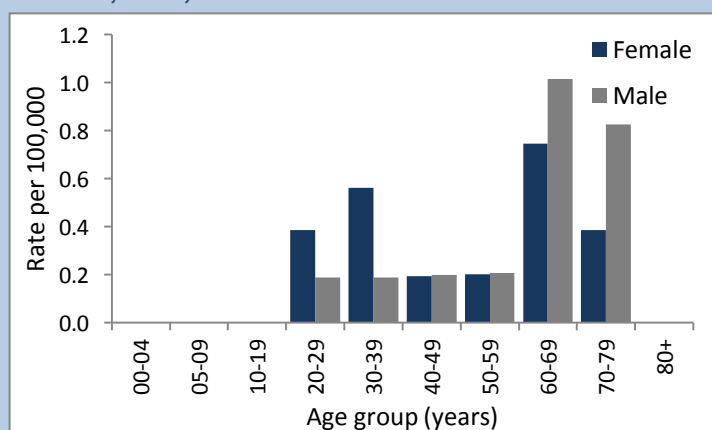


Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5Yr mean	2015
CC	0.4	0	0.1	0.0
FW	0.0	0	0.0	0.0
HNE	0.6	0	0.1	0.0
IS	0.0	0	0.0	0.0
M	0.2	0	0.1	0.0
MNC	0.2	0	0.1	0.0
NBM	0.0	0	0.0	0.0
NNSW	0.0	0	0.0	0.0
NS	3.6	3	0.4	0.3
SES	4.4	2	0.5	0.2
SNSW	0	0	0.0	0.0
SWS	2.8	5	0.3	0.5
SYD	3.6	2	0.6	0.3
WNSW	0	0	0.0	0.0
WS	4.6	9	0.5	1.0
NSW	20.4	21	0.3	0.3

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

Notification rate per 100,000 population by age category and sex, 2015, NSW



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 cases of rotavirus are not routinely followed up in NSW.

Summary 2015

- Case count: 1040
- Reported hospitalisations: 88
- Reported deaths: 1
- Notification rate per 100,000: 13.7

Seasonality

- Peaks in winter/spring

Outbreaks

- Cases found to be associated with an outbreak: 4%

Overall trend:

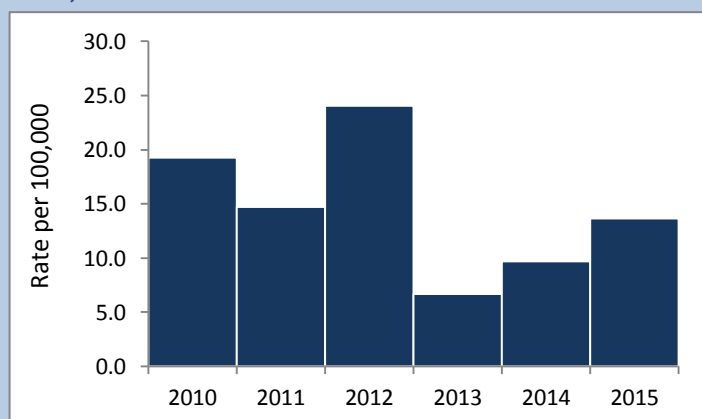
- 8% decrease in 2015 notification rate compared to 5 year average (15.0 per 100,000)

***Note:** Rotavirus was made notifiable in 2010.

Groups with highest notification rate in 2015

- Age: <5 years (52% - 108.6 per 100,000)
- Sex: Female (51% - 4 per 100,000)
- LHD: Western NSW (8% - 23.3 per 100,000)

Notification rate per 100,000 population by year, 2010 – 2015, NSW

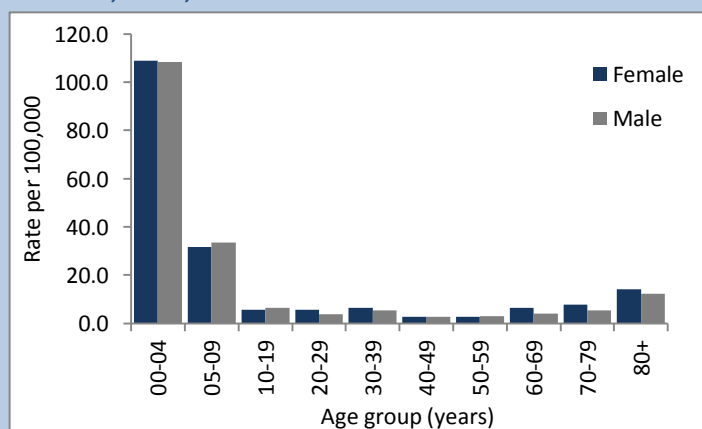


Number of cases and rates (per 100,000) by Local Health District, 2015, NSW

LHD	COUNT		RATE	
	5Yr mean	2015	5Yr mean	2015
CC	27.8	45	8.6	8.6
FW	3.8	10	12.2	12.2
HNE	153.0	90	17.3	17.3
IS	41.8	26	10.8	10.8
M	26.8	28	11.2	11.2
MNC	12.4	6	6.0	6.0
NBM	71.2	60	20.4	20.4
NNSW	56.4	54	19.5	19.5
NS	160.2	153	18.6	18.6
SES	136.8	122	15.9	15.9
SNSW	14.4	25	7.3	7.3
SWS	88.6	80	10.0	10.0
SYD	84.0	85	14.3	14.3
WNSW	63.6	83	23.3	23.3
WS	141.0	173	16.4	16.4
NSW	1081.8	1040	15.0	15.0

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

Notification rate per 100,000 population by age category and sex, 2015, NSW



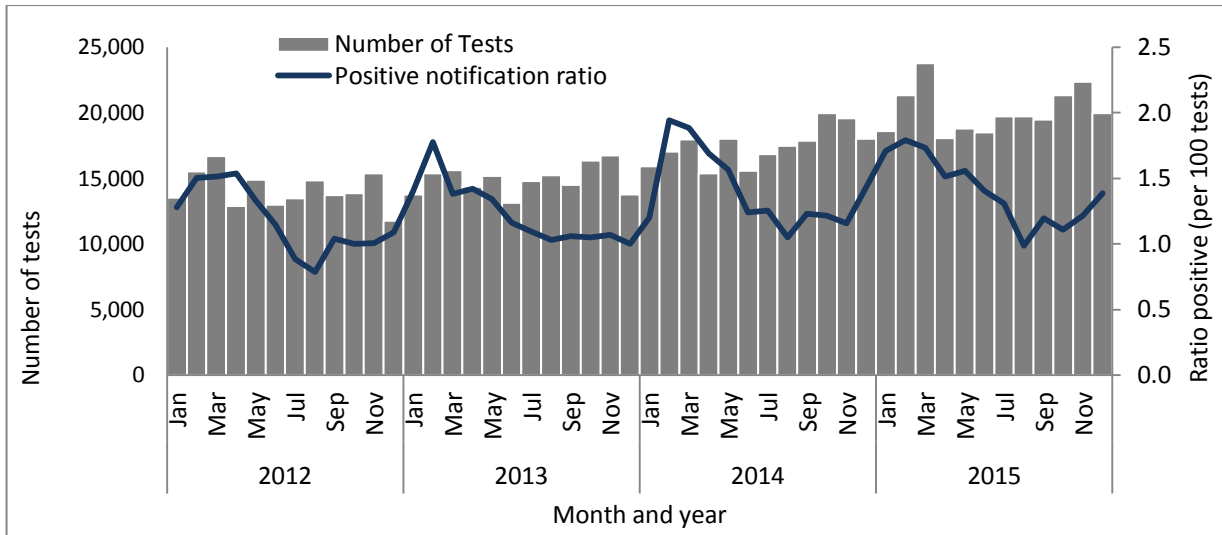
Denominator data

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 2015:

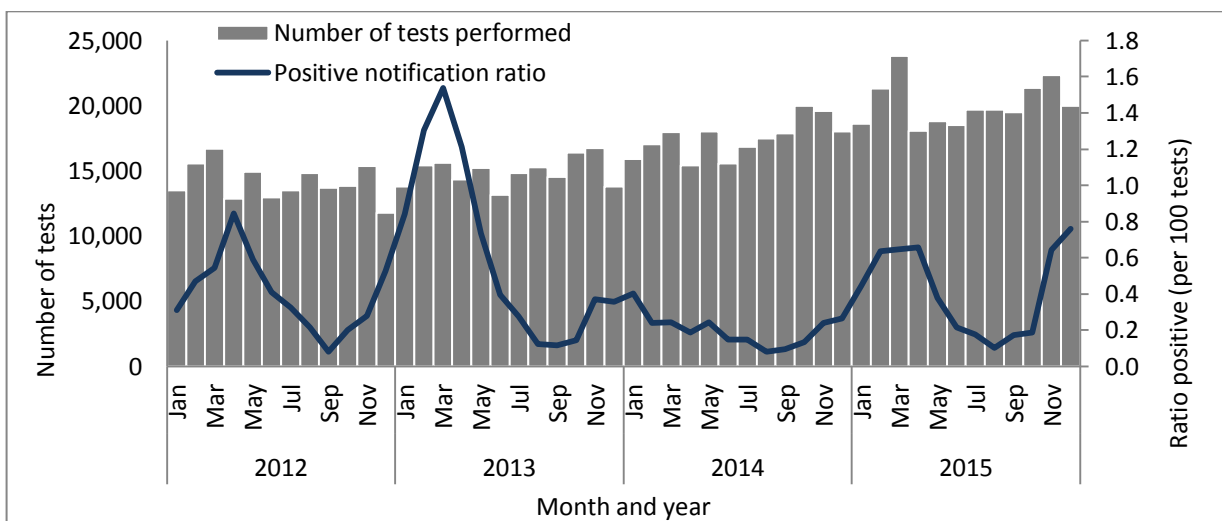
- *Giardia* positive notification ratios peaked during late-summer at 1.79 (per 100 tests performed).
- There were two peaks in the cryptosporidium positive notification ratio; February–March (0.65 per 100 tests performed) and November –December (0.76 per 100 tests performed).
- *Salmonella* positive notification ratio follows a seasonal pattern, peaking in January at 3.1 (per 100 tests performed)
- *Shigella* positive notification was highest in July at 0.11 (per 100 tests performed)

Number of *Giardia* tests performed by 15 laboratories and ratio positive by month and year, NSW, 2012–2015*



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

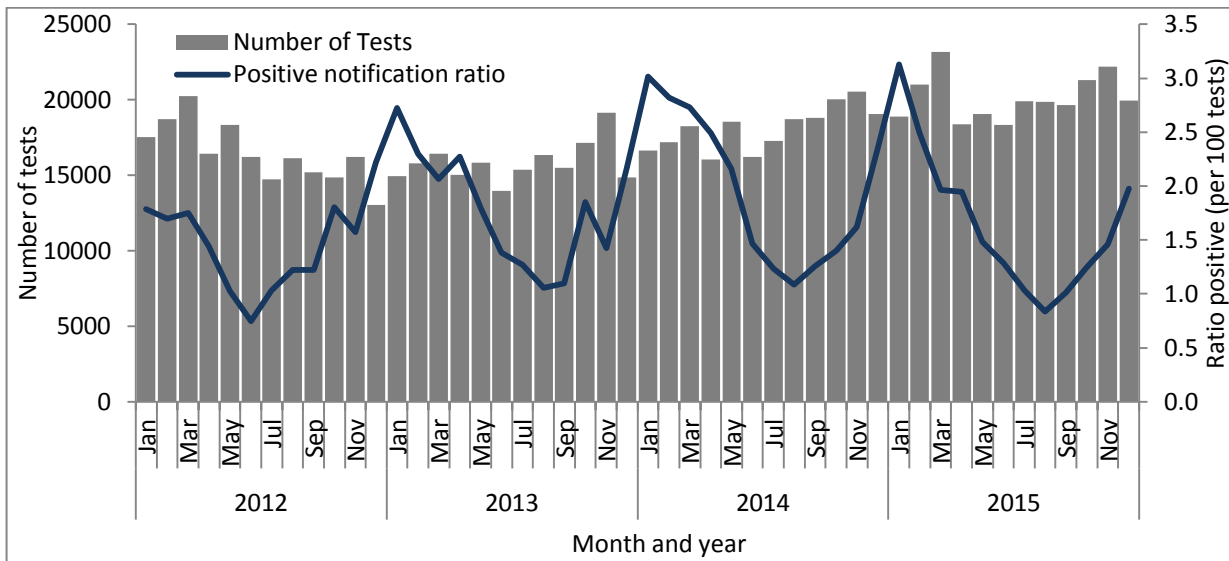
Number of *Cryptosporidium* tests performed by 15 laboratories and ratio positive by month, NSW, 2012–2015*



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

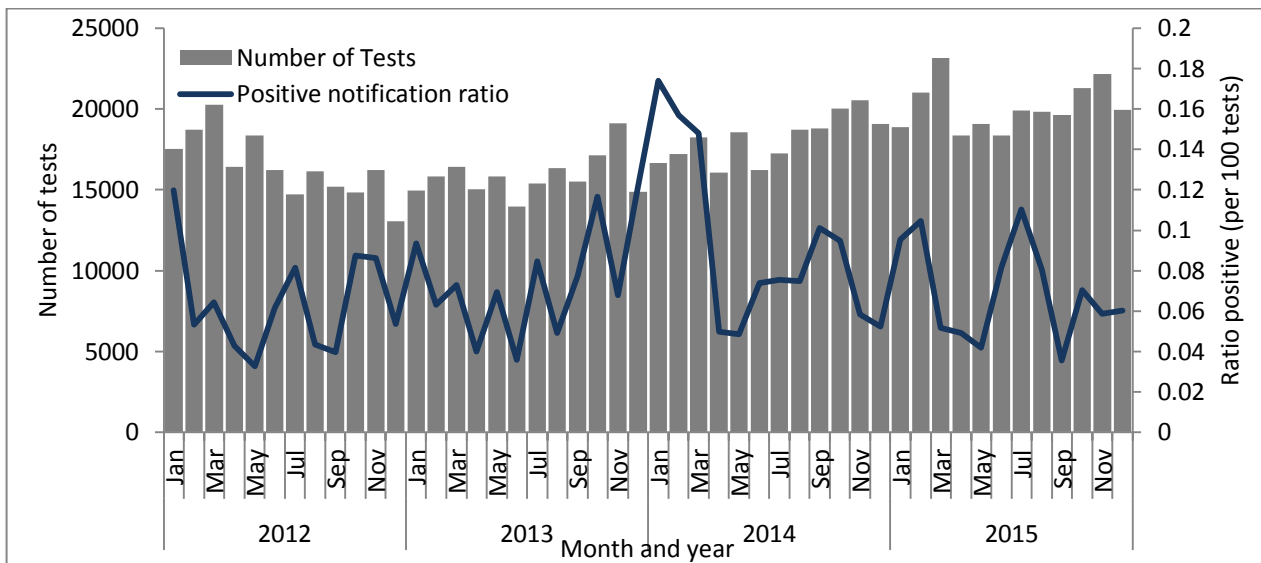
Denominator data continued

Number of *Salmonella* tests performed by 15 laboratories and ratio positive by month, NSW, 2012–2015*



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

Number of *Shigella* tests performed by 15 laboratories and ratio positive by month, NSW, 2012–2015*



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

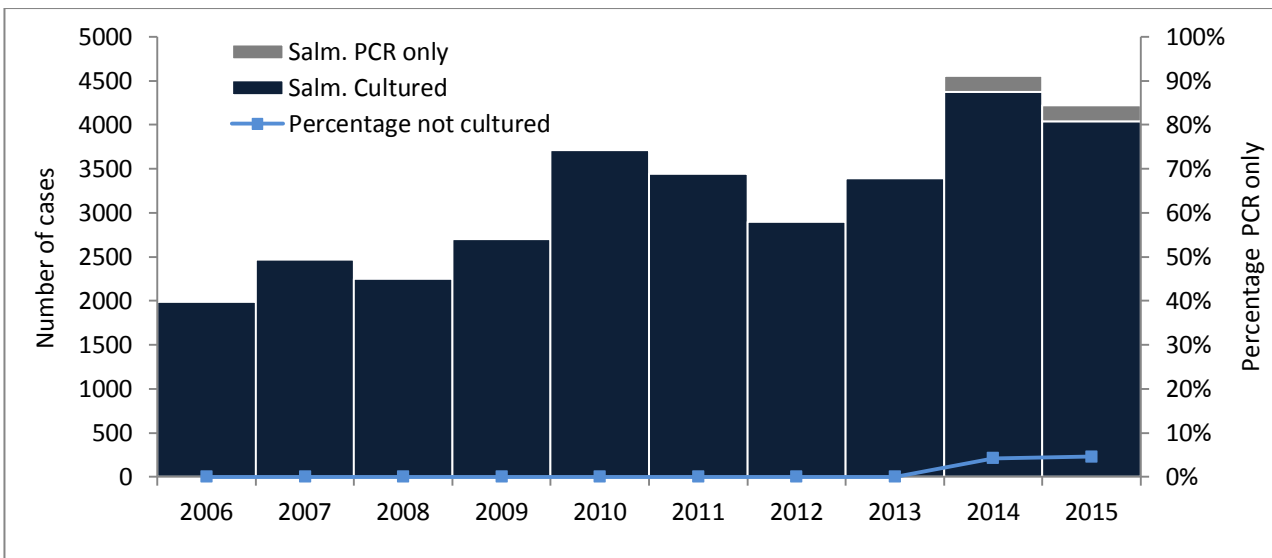
Culture Independent Testing

Culture independent testing (CIDT) does not require isolation and identification of living organisms but works by detecting the presence of a specific antigen. 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.

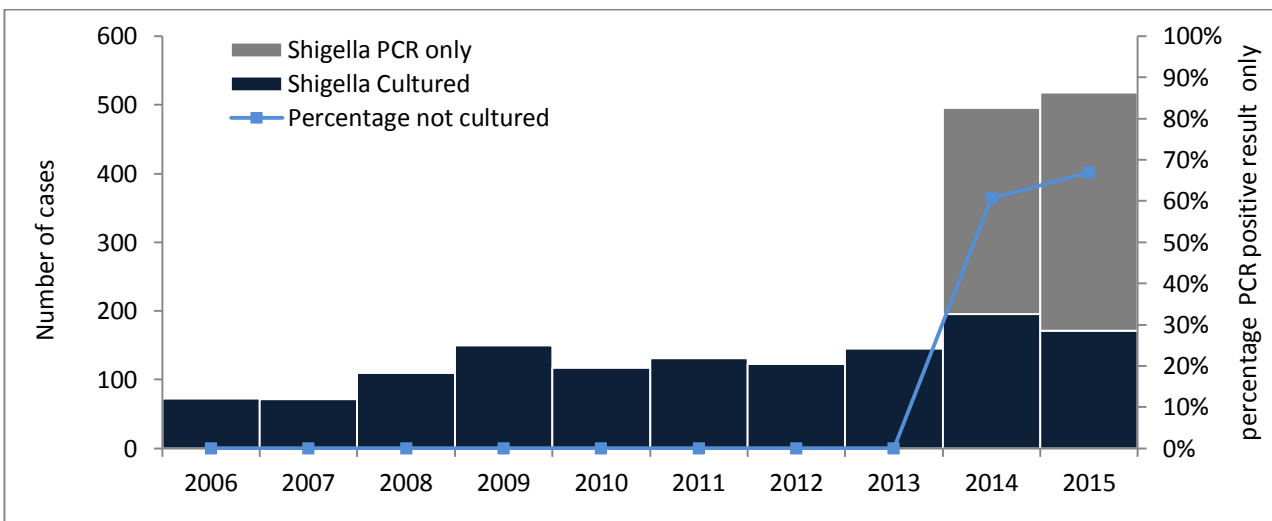
Summary:

- 5% of *Salmonella* notifications in 2015 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.
- 67% of *Shigella* notifications in 2015 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 notifications.
 - 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 from 2006 to 2015.



The number of *Shigella* notifications, by test type, and the percentage with only PCR* positive result in NSW from 2006 to 2015.



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

SURVEILLANCE OF FOODBORNE OUTBREAKS

A food-borne disease outbreak may be defined as a situation where 2 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 begin by surveillance of identified clusters of the same disease or by reports of illness in 2 or more people who consumed the same food.

Summary 2015

- Foodborne/ potential foodborne outbreaks: 58
- Number ill: 569

Causative agent in 2015

- Unknown: 43%
- *Salmonella* : 40%
- *Salmonella* Typhimurium: 33%

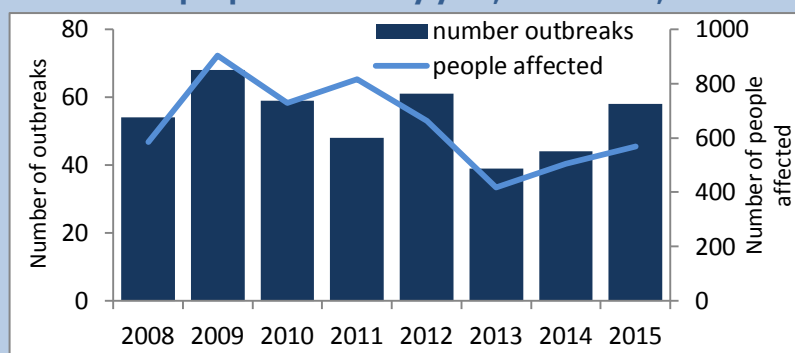
Overall trend:

- 15% increase in number outbreaks compared to 5 year average (50.2 outbreak)
- 9% decrease in number ill compared to 5 year average (625.4 people ill)

Contributing factors in 2015

- Unknown 55%
- Undercooked or raw eggs 21%
- Cross contamination 7%

Number of foodborne or suspected foodborne outbreaks and number people affected by year, 2008-2015, NSW.



Number of foodborne outbreaks and number of people affected by Local Health District, 2015, NSW

LHD	# outbreaks	# ill
CC	6	68
FW	0	0
HNE	3	35
IS	3	44
M	1	14
MNC	0	0
NBM	2	36
NNSW	1	22
NS	11	69
SES	9	63
SNSW	2	6
SWS	3	22
SYD	6	22
WNSW	2	14
WS	6	102
NSW*	2	35
National*	1	17

*NSW cases only.

Foodborne outbreak by causative agent and year, 2010-15, NSW

Causative agent	2010	2011	2012	2013	2014	2015
Unknown	29	25	28	19	8	25
Salmonella (all serotypes)	25	16	27	12	26	23
<i>Salmonella</i> Typhimurium	22	13	23	9	26	19
Norovirus	1	3	1	6	1	2
Campylobacter	2	2	0	1	0	2
<i>Clostridium</i> perfringens	1	1	2	0	0	1
Fish poisoning	1	1	1	0	4	4
Listeria	0	0	0	1	1	0
Hepatitis E	0	0	0	0	1	0
STEC	0	0	0	0	1	0
Hepatitis A	0	0	0	0	0	1
Shigella	0	0	0	0	1	0
Total outbreaks	59	48	61	39	44	58

Foodborne outbreaks continued

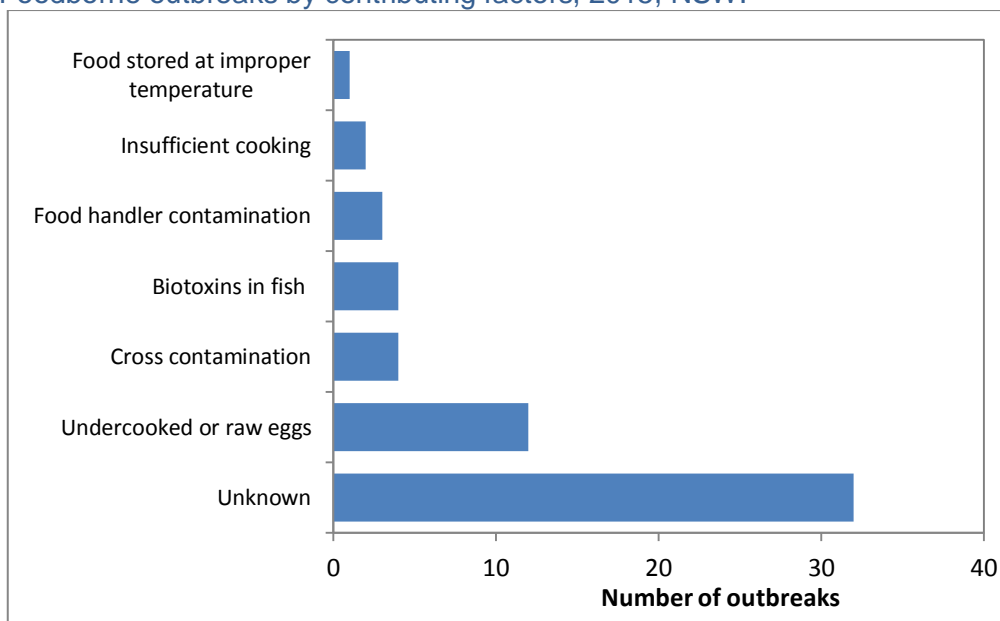
Description of outbreaks by causative agent

Number of outbreaks, number ill and number hospitalised by causative agent, 2015, NSW

Causative agent	Number of outbreaks	Number ill	Ratio ill per outbreak	Number hospitalised	Ratio hospitalised per outbreak
Unknown	25	251	10.0	5	0.2
<i>Salmonella</i>					
Typhimurium	19	179	9.4	21	1.1
Other <i>Salmonella</i>	4	41	10.3	14	3.5
Fish Poisoning	4	16	4.0	4	1.0
Campylobacter	2	4	2.0	2	1.0
Norovirus	2	57	28.5	3	1.5
Hepatitis A	1	17	17.0	7	7.0
<i>Clostridium perfringens</i>					
	1	4	4.0	0	0.0
Total	58	569	9.8	56	1.0

Summary foodborne outbreaks by contributing factors

Foodborne outbreaks by contributing factors, 2015, NSW.



OUTBREAK SUMMARY 2015

Foodborne and potentially foodborne disease outbreaks investigated in NSW, 2015

PHU ID number	Month of onset	Setting	Pathogen	No. ill	No. hospitalised	Evidence*	Epi. Study**	Suspected / Responsible vehicle	Contributing factors
NS48331	Dec	Restaurant	Campylobacter	2	1	D	N	Chicken liver pate	Insufficient cooking
SYD44808	May	Restaurant	Campylobacter jejuni	2	1	D	N	Likely chicken liver pate	Insufficient cooking
CC201501	Apr	Private residence	Ciguatera poisoning	4	1	D	D	Spanish mackerel	Biotoxins in fish flesh
SES201502	Sep	Private residence	Ciguatera poisoning	3	1	M	D	Red-throat Emperor fish	Biotoxins in fish flesh
SYD44475	Apr	Restaurant	Clostridium perfringens	4	0	D	N	Unknown	Cooked food storage at improper temperature
National*	Jan	Pre-packaged food	Hepatitis A	17	7	DA	CC	Frozen mixed berries (imported)	
HUN46716	Aug	Bakery	Norovirus	18	1	D		Unknown	Unconfirmed food handler contamination
IS47262	Oct	Restaurant	Norovirus	39	2	D	N	Unknown	Unknown
WS45433	Jun	Take away	Salmonella Agona	3	0	M	D	Tuna sushi rolls	Cross contamination
NSW201501	Jan	Aged Care Facility	Salmonella Bovismorbificans	33 (3 were ACT residents)	12	DM	D	Baked dessert items	Cross contamination
NS44106	Mar	Restaurant	Salmonella PCR+	5	1	D	N	Tiramisu	Use of raw eggs

* 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	No. hospitalised	Evidence*	Epi. Study**	Suspected / Responsible vehicle	Contributing factors
NS201501	Feb	Restaurant	Salmonella Typhimurium MLVA 3-10-8-12-523	9	0	D	N	Unknown	Potential for cross contamination
CC48110	Dec	Restaurant	Salmonella Typhimurium MLVA 3-10-9-9-523	3	0	D	N	Unknown	Unknown
NS43533	Jan	Restaurant	Salmonella Typhimurium MLVA 3-12-11-14-523	12	0	D	D	Menu items containing undercooked egg	Undercooked egg products
NS44476	Jan	Restaurant	Salmonella Typhimurium MLVA 3-12-11-14-523	2	0	D	D	Suspected raw egg sauces	Use of raw eggs
NSW201502	Oct	Take away	Salmonella Typhimurium MLVA 3-12-11-14-523	5	0	D	D	Raw egg mayo	Undercooked egg products
WS47224	Sep	Restaurant	Salmonella Typhimurium MLVA 3-12-11-14-523	40	0	M	C	Fried ice-cream	Undercooked egg products
NC44782	May	Restaurant	Salmonella Typhimurium MLVA 3-12-12-9-523	11	0	D	D	Dessert containing raw egg	Use of raw eggs
HUN0491	Jan	Restaurant	Salmonella Typhimurium MLVA 3-12-13-9-523	13	3	D	D	Unknown	Unknown
WS201501	May	Child care centre	Salmonella Typhimurium MLVA 3-14-9-13-523	4	1	D	N	Unknown	Multiple potential sources
SWS47182	Sep	Bakery	Salmonella Typhimurium MLVA 3-16-9-11-523	12	9	M	D	Vietnamese pork rolls	Use of undercooked egg and chicken liver products & cross contamination

* 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	No. hospitalised	Evidence*	Epi. Study**	Suspected / Responsible vehicle	Contributing factors
NS44155	Mar	Restaurant	Salmonella Typhimurium MLVA 3-24-14-10-523	7	0	D	N	Unknown	Unknown
SNSW201501	Dec	Restaurant	Salmonella Typhimurium MLVA 3-26-13-8-523	2	0	0	N	Battered fish	unknown
WS47768	Nov	Restaurant	Salmonella Typhimurium MLVA 3-26-13-8-523	40	2	D	C	Products containing raw eggs	Undercooked egg products
HUN0494	Nov	Restaurant	Salmonella Typhimurium MLVA 3-26-17-10-523	4	1	D		Unknown	Unknown
SES201503	Nov	Private residence	Salmonella Typhimurium MLVA 3-9-7-12-523	3	2	D	N	Unknown	Unknown
NS44477	Feb	Restaurant	Salmonella Typhimurium MLVA 3-9-7-12-523 & 3-12-12-9-523	5	0	D	N	Unknown	Unknown
IS201501	Mar	Restaurant	Salmonella Typhimurium MLVA 3-9-7-13-523	4 (2 were Act residents)	0	D	D	Menu items containing undercooked egg	Undercooked egg products
SES43164	Jan	Restaurant	Salmonella Typhimurium MLVA 3-9-8-12-523	3	0	D	D	Tiramisu	Use of raw eggs
GS201501	Mar	Community event	Salmonella Typhimurium PT 12A	4	3	D	N	Pancake batter containing eggs	Undercooked egg products
SES43819	Feb	Restaurant	Salmonella Virchow	3	1	D	D	Menu items containing undercooked egg	Undercooked egg products

* 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	No. hospitalised	Evidence*	Epi. Study**	Suspected / Responsible vehicle	Contributing factors
SES201501	Feb	Take-away	Scombroid fish poisoning	7	0	M	N	Canned tuna (imported)	poor handling of degradable product
WS201502	Oct	Private residence	Scombroid poisoning	2	2	D	N	Fish (unknown variety)	poor handling of degradable product
SES46394	Aug	Take Away	Unknown	3	0	D	N	Unknown	Unknown
SYD46553	Aug	Restaurant	Unknown	3	0	D	N	Unknown	Unknown
SWS46313	Aug	Restaurant	Unknown	5	0	D	N	Unknown	Unknown
SES48218	Dec	Take away	Unknown	2	0	D	N	Chicken curry	Unknown
SYD48126	Dec	Restaurant	Unknown	5	0	D	N	Unknown	Unknown
LIS48304	Dec	Restaurant	Unknown	22	3	D	N	Unknown	Unknown
SES43608	Feb	Take-away	Unknown	30	UK	D	N	Vietnamese style chicken & salad rolls	Unknown
SYD43371	Jan	Restaurant	Unknown	3	0	D	N	Unknown	Unknown
CC45931	Jul	Restaurant	Unknown	10	0	D	N	Unknown	Unknown
WNSW201501	Jul	Take Away	Unknown	9	0	D	N	Unknown	Unknown
NBM45571	Jun	Take away	Unknown	6	0	D	N	Kebabs	Suspected cross contamination

* 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	No. hospitalised	Evidence*	Epi. Study**	Suspected / Responsible vehicle	Contributing factors
SES45198	Jun	Restaurant	Unknown	9	0	D	N	Unknown	Unknown
CC45161	May	Commercial caterer	Unknown	12	1	D	C	Unknown	Suspected food handler contamination
NS45038	May	Restaurant	Unknown	7	0	D	N	Unknown	Unknown
NS47994	Nov	Restaurant	Unknown	4	0	D	N	Oysters	unknown
CC47901	Nov	Restaurant	Unknown	10	0	D	D	Unknown	Food handler contamination
NBM201501	Nov	Restaurant	Unknown	30	0	D	N	Unknown	unknown
WNSW201502	Nov	Restaurant	Unknown	5	0	D	N	Unknown	Unknown
NC48024	Nov	Restaurant	Unknown	5	0	D	N	Unknown	Unknown
SWS48104	Nov	Restaurant	Unknown	5	0	D	N	Unknown	Unknown
IS47323	Oct	Restaurant	Unknown	5	0	D	N	Unknown	Unknown
WS47496	Oct	Restaurant	Unknown	13	0	D	C	Unknown	Unknown
MS47259	Oct	Restaurant	Unknown	14	1	D	N	Unknown	Unknown
CC47096	Sep	Function	Unknown	29	0	D	C	Unknown	Unknown
SYD47214	Sep	Restaurant	Unknown	5	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 during 2015

Salmonella Bovismorbificans outbreak in aged care facilities

In February 2015, a regional PHU was notified of an outbreak of salmonellosis in an aged care facility (ACF). An outbreak investigation was initiated by the PHU in conjunction with Health Protection NSW and the NSW Food Authority (NSWFA).

In total, the outbreak affected 33 residents across 10 ACFs in NSW and the ACT. The ACFs shared common food suppliers. All 33 residents tested positive for *Salmonella Bovismorbificans*, 30 were further characterised as phage type 14 (the remaining three were not phaged typed).

Illness onsets were between 21 January and 23 February 2015. An additional case occurred on 24 March 2015, this was classified as a secondary case likely to have been infected through contact with a case who had prolonged excretion of *Salmonella*. Facility based attack rates ranged from 0.6 -7.5 per cent.

The environmental investigation identified *Salmonella Bovismorbificans* phage type 14 at the premises of a baked dessert supplier to the ACFs and on food samples. While definitive food histories were difficult to obtain, desserts from this supplier were consumed by the majority of affected residents.

The NSWFA issued a prohibition order preventing further sales of items from the bakery (NSW201501)

Scombroid fish poisoning

On 23 February 2015 a metro PHU was notified of four separate cases of suspected scombroid poisoning. Cases presented with red face, headache, tingling, sweating, vomiting and palpitations. The subsequent investigation identified a total of seven cases. All seven cases

consumed a tuna salad from the same local food outlet. Onset of symptoms were within 10-15 minutes of tuna consumption. The NSWFA initiated an investigation on Monday 23 February. The tuna product in use was a canned product imported from Thailand that had a small distribution to some restaurants and cafes. A trade level recall was conducted on the product implicated, preventing further cases. (SES201501)

Salmonella Agona

An increase in *Salmonella Agona* (9 cases) in Western Sydney in May and June 2015 was identified through routine surveillance. Six had consumed sushi from one of two sushi outlets in the same shopping centre. For the cases related to the shopping centre, consumption dates ranged from 7 April to 23 June 2015, four from sushi outlet A and two from sushi outlet B. Both venues were inspected by the NSWFA and were reported to have potential for cross contamination of ready to eat foods. It was reported no ingredients or staff were shared between the shops but records were not available to confirm this.

Samples were taken from both venues, with sushi outlet A returning positive *Salmonella Agona* results from sushi rolls. The tuna mix for tuna sushi rolls was positive for *Salmonella Agona*, even though the individual ingredients for this mix and the tools used to make this mix were all negative. The venue was prohibited from selling the tuna product until it showed evidence of *Salmonella* clearance. Whole genome sequencing was performed on all *Salmonella Agona* isolates for this time period as well as 10 food isolates obtained during the outbreak and from retail samples of raw chicken meat identified earlier in the year.

The sequencing showed all six people who reported eating at the two sushi outlets had

identical sequencing as did five others who did not report the sushi restaurant or were not interviewed. Three of these were from the first quarter of the year. All of the *S. Agona* isolates from sushi outlet A were also identical to these cases. These were also very similar to two raw retail chicken isolates identified earlier in the year through routine sampling. This analysis suggests the source of the *S. Agona* in this cluster may have been chicken meat, with a common source of chicken for the two sushi venues likely at the time of the outbreak and environmental contamination from raw chicken the source of the *Salmonella* in the businesses. (WS45433)

Salmonella in a child care centre

Interviews with four children from Western Sydney with *Salmonella* Typhimurium MLVA 3-14-9-13-523 revealed that they all attended the same childcare centre and became ill at about the same time. Potential risk factors identified at the centre through interviews included serving of high risk foods (eggs and salmon fish cakes) in the day(s) prior to illness onset, and contact with animals. The centre catered for 82 children and had 12 staff. The PHU conducted an environmental assessment. An inspection of the kitchen, observing serving processes and discussions with the cook revealed that the kitchen and food was unlikely to be the source of infection. Vegetables were grown in an outdoors vegetable garden, but were not used in meal preparation in the centre. There were however other potential vectors for *Salmonella* contamination.

- Farm animals: There were a number of farm animals (sheep, alpaca and chickens) that were located in an adjacent paddock and contact between the children and animals was possible through a fence. Contact was unsupervised and hand washing stations were not located in close proximity to where contact occurred.
- Pet rooster: A rooster was able to roam freely in the centre. Contact was possible between the children, rooster feathers and faeces.

- Water: The centre had two 100,000 litre concrete underground tanks that captured rainwater. The reticulated supply to the centre was drawn up by pump from the tanks and went through taste and odour filters that had not been serviced or replaced in seven years.
- Septic waste: Despite the centre's size it relied on a small domestic septic system, which had missed its recent regular servicing. Pooling of water around the onsite septic system was evident.
- Garden soil: A load of garden soil had been donated to the centre. The mix had been used in the play areas of the centre and some had been taken indoors for the children to play with.
- Others: Toileting was unsupervised and practices were poor with unflushed faecal matter in several bowls. Also the sand pit was uncovered and had not been maintained according to guidelines.

Immediate action to mitigate these potential sources of *Salmonella* was commenced.

Norovirus linked to a Bakery.

A foodborne complaint was received by the NSWFA about illness in a group of people who had consumed food together at a training event from 25 to 27 August 2015. The event was catered by a bakery local to the group. The investigation subsequently identified a second cluster of illnesses involving individuals who attended a staff lunch catered by the same bakery on 27 August 2015. One other case, not associated with either cluster, was identified through a GP practice. This individual also reported consuming food from the bakery on 27 August, 2015.

A total of 18 people became ill, out of a potential 19. Symptoms of fever, nausea, vomiting, diarrhoea and abdominal cramps occurred on average 31 hours after the events. One person was hospitalised. Samples were taken from two people, of which one was positive for norovirus.

The foods consumed were sandwiches and salads made fresh at the bakery.

The bakery was inspected by the local council and it was reported a staff member who was involved in making the sandwiches had fallen ill on 24 August 2015. The local council emphasised the requirements in the Food Standards Code for food handlers and managers to monitor staff health, and not handle or compromise food and other staff if suffering from an infectious disease. The source of the illness was not confirmed, however, it is suspected that an ill food handler may have contaminated produce items prepared for salads and sandwiches sold on 27 August 2015. (HUN46716)

***Salmonella* Typhimurium MLVA 3-26-13-8-523**

A metro PHU received a report of a person who was hospitalised with gastroenteritis and subsequently tested PCR positive to *Salmonella*. This person reported others who ate a meal with him at a restaurant on 29 October 2015 also experienced symptoms. The PHU initiated a cohort study and found 40 of 69 attendees reported illness after the dinner with onsets 29 October to 4 November 2015. Seven diners submitted stool samples which were positive for *Salmonella* Typhimurium (MLVA 3-26-13-8-523).

The meal was a six course degustation and consumption rates were high for most items, however a significant risk ratio was found for one item, a coriander mayonnaise (RR=3.58, CI:1.04-12.26, p<0.001). This mayonnaise was made with raw egg and on inspection found to be made with insufficient acidifying ingredient to neutralise any *Salmonella* present. Environmental and food samples were taken by the NSWFA and all were

negative for pathogens, however the food sampled was stock received 12 days after the dinner. The cause of the outbreak was likely the use of contaminated raw egg dishes. The restaurant has been advised to cease serving raw egg foods. (WS46778)

Hepatitis A linked to frozen berries

In the first quarter of 2015 there was an Australia-wide outbreak of 35 cases of locally acquired hepatitis A (genotype 1a) with a unique genetic sequence. Many of these cases reported consuming the same brand of mixed frozen berries.

Seventeen of these cases were NSW residents, nine of whom reported consuming the implicated frozen berries, while five were secondary cases who acquired their infection from an outbreak case and one was a tertiary case. Two cases had the outbreak sequence but did not report consuming the implicated berries or have contact with a known case.

The implicated frozen berries were recalled from sale on 14 February 2015. Hepatitis A with the outbreak sequence was isolated from an opened packet of mixed frozen berries of one of the cases. Testing of an unopened packet from the supermarket shelf resulted in a positive test for hepatitis A virus however there was not enough virus to perform typing.

The implicated berries were packed in China and originated from farms in China and Canada. Food Standards Australia New Zealand worked closely with the Department of Agriculture who were responsible for working with Chinese Government authorities to investigate farm and food handling practices.

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 2015

- Number of outbreaks: 456
- Number of people affected: 7,034
- Number of outbreaks sampled: 212 (46%)

Overall trend (compared to 5 year average):

- 23% decrease in the number of outbreaks
- 20% decrease in the number of people affected

Seasonality

- Child care centres: Peaks in March
- Aged care and hospitals: Peaks in August/September

Groups with highest frequency in 2015

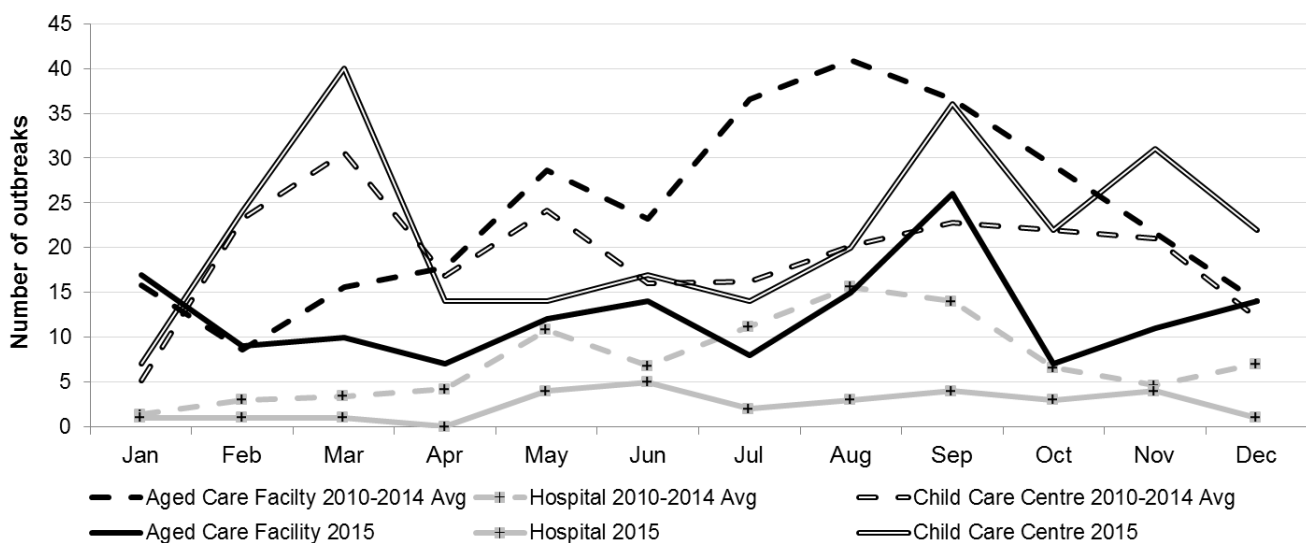
- Facility type: Child care centres, 261 (57%) of outbreaks
- Attack rate in staff: child care centres at 18%
- Attack rate in non-staff: hospital patients at 29%
- Average duration of outbreaks: Childcare centres at 11 days

Causative agent

- Norovirus - 14% of outbreaks (30% of outbreaks with a stool sample collected)

(Note: only 46% of outbreaks had one or more stool samples collected)

Number of reported outbreaks of gastrointestinal illness in institutions in 2015 and average of the previous 5 years by month and facility type



Characteristics of outbreaks of gastrointestinal illness in institutions reported to NSW in 2015

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 found)
Aged Care	149	563: 6%	1966: 19%	7	126: 85%	44:norovirus & 7:rotavirus
Childcare	261	679: 18%	3078: 14%	11	53: 20%	3:norovirus & 16:rotavirus
Hospital	28	140: 11%	247: 29%	7	23: 82%	13:norovirus & 1:rotavirus
Other*	19	57: 3%	304: 15%	10	10: 53%	4:norovirus
TOTAL	456	1439: 9%	5595: 16%	9	212: 46%	84

*Military facilities, schools, correctional facilities, 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 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: 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 campylobacter and norovirus infection are not notifiable in NSW.

NSW laboratories report cases of notifiable enteric diseases to public health units (PHUs). Confirmed and probable 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 continued

Methods

We analysed data for the following notifiable enteric pathogens; *Salmonella*, *Salmonella* Paratyphi, *Salmonella* Typhi, *Listeria monocytogenes*, *Shigella*, HUS and STEC, *Cryptosporidium*, *Giardia*, rotavirus and hepatitis A & E viruses. On 23 March 2016, 2015 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 2014 were compared with the average annual count for the years 2010 to 2014. The NSW estimated resident population for 30 June of each year from 2010-2015 was used to calculate crude incidence rates for each disease.^{iv}

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 from 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 cryptosporidium, giardia, salmonella and shigella infections were analysed for the period between 1 January 2012 and 31 December 2015, 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 28 March 2015.

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- Local Councils in NSW that contribute to enteric disease investigations
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- Partners in Department of Primary Industries and associated stakeholders

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).

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.