

OzFoodNet

Enhancing Foodborne Disease Surveillance Across Australia

NSW SECOND QUARTER REPORT

April – June 2020



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Highlights Quarter 2, 2020

This report describes data for enteric conditions for quarter 2, 2020. The report is divided into four sections: enteric notifiable diseases highlights, *Salmonella* spotlight, foodborne outbreaks and gastroenteritis outbreaks in institutions. Data sources and analytical methods are described at the end of the report. Every endeavour has been made to ensure that the information provided in this document is accurate at the time of writing. However, infectious disease notification data are continuously updated and subject to change.

During the COVID-19 response in 2020 the control guidelines for public health unit management of some enteric conditions were temporarily amended. Therefore some information will not be available during this reporting period.

A total of 2548 enteric conditions were notified to NSW Public Health Units in quarter 2, 2020. The most notable increases above average levels in this quarter were for **STEC/VTEC** (42% increase) and **Campylobacter** (27% increase).

Notifications of **shigellosis** were well below average for quarter 2 2020 (65% below the five year average for the same period), primarily as a result of COVID-19 social distancing measures and the reduction of international travel. Of the 31 shigellosis cases notified in quarter 2, 2020, 39% were probable cases (PCR positive only) and 61% were confirmed cases (*Shigella* isolated on culture).

Salmonellosis notifications have notably decreased (by 38%) in quarter 2 2020 compared to the five-year quarterly average for the same period. *Salmonella* Typhimurium cases (n=272) were down 4% compared to the 5 year quarterly average (n=284). *Salmonella* Wangata was the second highest notified *Salmonella* serotype in quarter 2, 2020 (n=48).

Decreases were also observed in notifications of cryptosporidiosis, giardiasis, hepatitis E, hepatitis A, rotavirus, typhoid and paratyphoid in quarter 2, 2020 compared to the five year average for the same period. These decreases are largely attributed to the effects of COVID-19 social distancing measures and hygiene measures (such as hand washing) on limiting the spread of other communicable diseases, as well as the reduction in international travel owing to Australian border closures. The long term trends for 13 notifiable enteric conditions in NSW are shown in Figures 1-3.

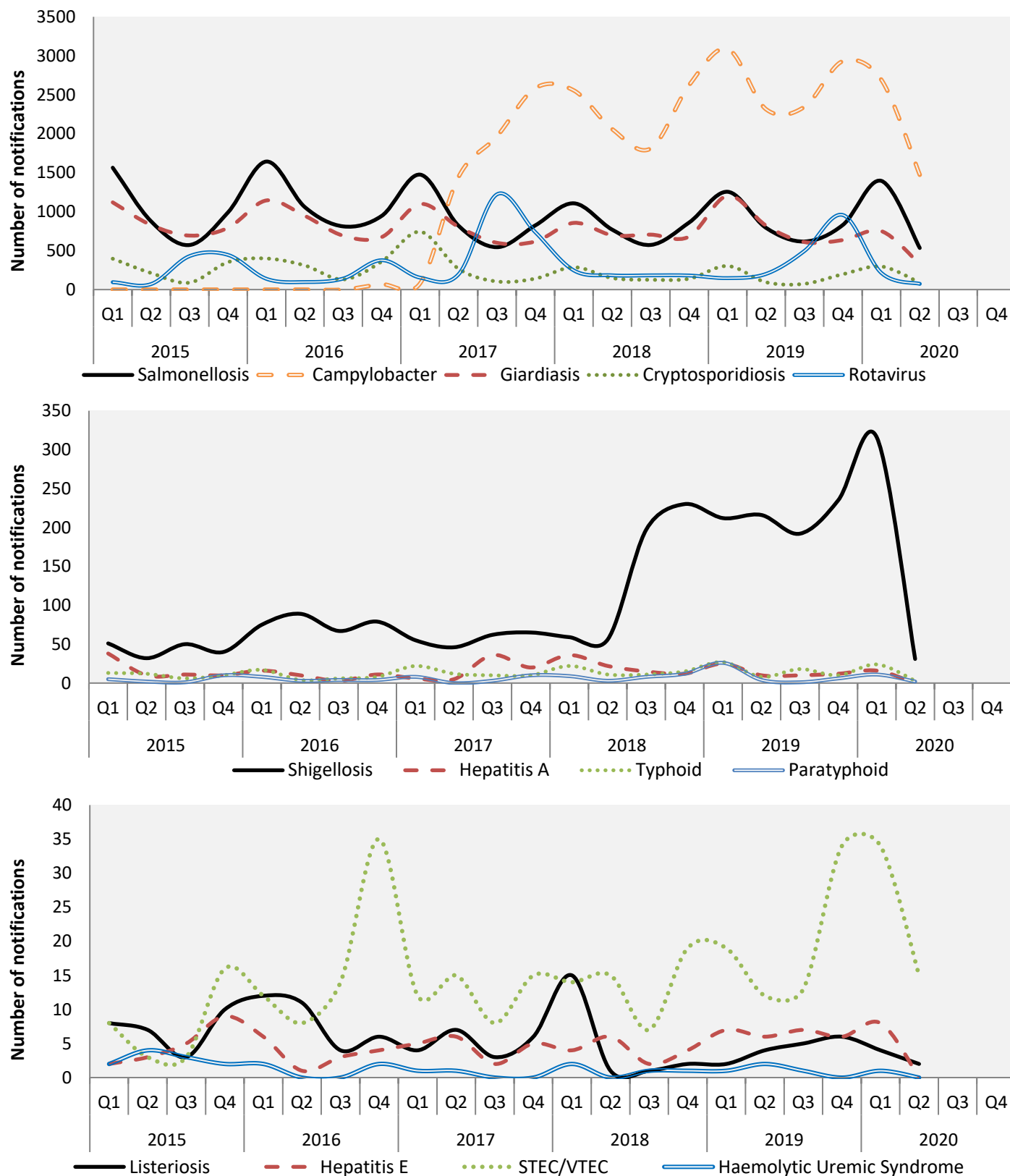
Although Typhoid notifications were 67% below the five-year average for the quarter, all three cases in this quarter were thought to be locally acquired which was 1400% above the 5-year average for locally acquired cases (n=0.2 cases). The three cases were all in separate households and all were thought to be secondary cases to family

members who had travelled overseas. For one case the likely source could not be confirmed, as the recently-travelled family member had once again left NSW and no test results were available for that suspected index case.

Five **foodborne or suspected foodborne outbreaks** were reported affecting 20 residents of NSW, of whom 4 were hospitalised (Table 3). A causative agent was linked to a food source in four outbreaks: bacillus cereus poisoning linked to consumption of rice, *Salmonella* Typhimurium linked to eggs, *Salmonella* Bareilly linked to sushi and lead poisoning linked to a saffron substitute. The fifth outbreak had gastrointestinal illness linked to a stew, but the pathogen was not confirmed.

Highlights continued

Figures 1-3. Number of notifications by year, quarter and disease, Jan 2015 to Jun 2020^{1,2}



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

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

Table 1. Notifiable enteric conditions, quarter 2 2020, by local health district

Notifiable Disease		CC	FW	HNE	IS	M	MNC	NBM	NNSW	NS	SES	SNSW	SWS	Syd	WNSW	WS	NSW	
Botulism	Notified, Q2 2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q2 mean, 2015-2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Campylobacteriosis ^{1,2}	Notified, Q2 2020	68	10	150	107	92	45	72	115	196	148	53	76	49	125	168	1474	
	5 y Q2 mean, 2015-2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptosporidiosis	Notified, Q2 2020	7	0	12	2	6	4	4	10	8	14	1	5	1	9	5	88	
	5 y Q2 mean, 2015-2019	12.2	0.2	22.0	15.6	10.0	9.6	9.2	12.6	26.8	31.4	2.8	13.8	17.4	7.8	14.2	205.6	
Giardiasis	Notified, Q2 2020	14	2	35	16	16	11	16	33	44	39	5	28	18	16	31	324	
	5 y Q2 mean, 2015-2019	34.6	1.6	96.4	45.0	32.2	22.8	34.6	40.2	124.6	153.8	11.6	57.8	68.8	31.4	64.0	819.6	
Hepatitis A	Notified, Q2 2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q2 mean, 2015-2019	0.2	0.0	1.0	0.4	0.4	0.0	0.4	0.4	0.6	1.8	0.0	1.0	1.6	0.0	2.6	11.4	
Hepatitis E	Notified, Q2 2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5 y Q2 mean, 2015-2019	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.4	0.2	0.0	0.8	0.8	0.0	1.2	3.8	
Listeriosis	Notified, Q2 2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	
	5 y Q2 mean, 2015-2019	0.2	0.0	0.4	0.0	0.6	0.0	0.2	0.0	1.2	1.0	0.2	1.0	0.8	0.0	0.0	6.0	
Paratyphoid	Notified, Q2 2020	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	
	5 y Q2 mean, 2015-2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.2	0.2	0.0	1.4	2.4	
Rotavirus	Notified, Q2 2020	0	0	2	2	9	0	8	1	16	6	3	11	4	0	10	74	
	5 y Q2 mean, 2015-2019	3.2	0.2	9.6	4.8	5.0	0.8	5.6	10.2	22.6	21.4	1.8	22.6	20.4	0.0	18.6	149.8	
Salmonellosis	Notified, Q2 2020	24	1	46	22	34	23	24	73	70	53	13	57	35	0	40	535	
	5 y Q2 mean, 2015-2019	37.0	3.2	86.8	38.6	30.8	36.0	36.2	71.4	129.0	99.4	19.8	89.8	60.4	0.0	96.4	862.2	
Shigellosis	Notified, Q2 2020	0	0	1	0	0	0	4	1	3	7	0	5	5	0	5	31	
	5 y Q2 mean, 2015-2019	4.6	0.0	4.0	1.2	1.2	1.0	2.4	4.0	13.8	20.8	1.8	4.8	17.8	0.0	9.4	87.8	
STEC	Notified, Q2 2020	0	0	0	1	2	0	4	2	0	2	0	1	0	0	3	15	
	5 y Q2 mean, 2015-2019	0.6	0.0	1.4	0.0	1.8	0.2	0.0	0.0	0.0	0.6	0.8	0.2	0.0	0.0	3.0	10.6	
HUS	Notified, Q2 2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	5 y Q2 mean, 2015-2019	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.2	0.0	1.4	
Typhoid	Notified, Q2 2020	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	3	
	5 y Q2 mean, 2015-2019	0.2	0.0	0.4	0.0	0.0	0.0	0.2	0.0	1.2	0.8	0.2	1.4	0.8	0.0	4.2	9.4	
Foodborne* Outbreaks	Notified, Q2 2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	
	People affected	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	20	

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

Table 2. Notifiable enteric conditions, quarter 2 2020, by overseas or local acquisition

Notifiable Disease	Place infection acquired	NSW, Q2 2020	5 yr Q2 mean 2015-2019	2020 % change
Enteritidis	Locally acquired	21	12.2	72%
	Overseas acquired	0	33.4	-100%
	Unknown	0	2.2	-100%
Hepatitis A	Locally acquired	0	5.0	-100%
	Overseas acquired	0	6.2	-100%
	Unknown	0	0.2	-100%
Hepatitis E	Locally acquired	0	0.4	-100%
	Overseas acquired	0	4.0	-100%
	Unknown	0	0.0	-
Paratyphi	Locally acquired	0	0.2	-100%
	Overseas acquired	1	2.2	-55%
	Unknown	1	0.0	-
STEC/VTEC	Locally acquired	11	8.8	25%
	Overseas acquired	0	0.8	-100%
	Unknown	4	1.0	300%
Shigellosis	Locally acquired	23	36.0	-36%
	Overseas acquired	2	40.2	-95%
	Unknown	6	11.6	-48%
Typhoid	Locally acquired	3	0.2	1400%
	Overseas acquired	0	8.6	-100%
	Unknown	0	0.6	-100%

Legend: Blue shading refers to a 100% or greater increase in the number of notifications compared to the five year quarterly average.

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

Foodborne and suspected foodborne outbreaks

NSW Health investigates all potential foodborne disease outbreaks. Gastroenteritis and foodborne outbreaks are identified via a range of mechanisms, including reports from the public, general practitioners, institutions such as residential care facilities and child care centres, emergency departments, analysis of surveillance data, and reports to the NSW Food Authority's (NSWFA) Consumer Complaints Line. The most notable outbreaks are described on pages 8-9.

Table 3. Foodborne and potentially foodborne disease outbreaks investigated in NSW, quarter 2 2020

PHU ID	Month ¹	Setting	Agent responsible	No. ill	Lab confirmed	No. Hospitalised	Evidence*	Responsible vehicles	Contributing factors
WS202001	April	Private residence	<i>Bacillus cereus</i> toxin	3	0	1	D & A	Rice	Toxic substance or part of tissue, other source of contamination
WS202003	May	Private residence	<i>Salmonella</i> Typhimurium	4	2	2	D	Eggs	Ingestion of contaminated raw products
NSW202001	June	Takeaway	<i>Salmonella</i> Bareilly	6	6	unknown	D	Sushi	Unknown
WS202004	June	Restaurant	Unknown	2	0	0	D	Stew with offal	Other source of contamination
WS202002	June	Private residence	Lead	5	5	1	D	Saffron substitute	Poisonous substance

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

*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.

Notable Foodborne Outbreaks

Key points

- The risk of illness from eating cooked rice can be prevented by either keeping cooked rice hot (above 60 degrees) or cooling the rice as quickly as possible and storing in a refrigerator below 5 degrees. If rice must be cooked in advance, it is recommended to not cook more than needed at one time.
- Regulatory bodies play an important role in conducting surveillance of imported food products. Where suspicion of disease seems likely to be related to an imported food, early notification to the public health unit is critical for timely investigation and response.
- Sushi is normally regarded as a potentially hazardous food. Consequently, the NSW Food Authority has published food safety guidelines for the preparation and display of sushi. The guidelines detail correct acidification procedures for rice, instructions for pH measurement, and temperature calibration and measurement.

***Bacillus cereus* poisoning linked to rice consumption (MLHD202002)**

In April, a woman in her 40s from metropolitan Sydney was notified to the local public health unit for suspected *Bacillus cereus* toxin-mediated poisoning. The woman had no underlying health conditions. She was admitted to the Intensive Care Unit (ICU) where she developed multi-organ failure and unfortunately died from her condition.

Upon investigation, it was found that the woman had developed serious symptoms within hours of consuming a dish prepared with rice that had been cooked one week earlier. The rice was reportedly cooked, left on the bench for a number of hours to cool, then placed in the fridge.

Her initial symptoms included vomiting, but notably, she had nil diarrhoea. While other family members had also consumed the dish, they experienced milder symptoms and did not require admission to hospital.

The case's husband also found a sample of the leftover rice in the fridge and submitted it to the laboratory for analysis. Heavy growth of *Bacillus cereus* was cultured from the leftover rice, which then returned a toxin positive result. A patient sample was unable to be collected for comparison.

Lead poisoning associated with a saffron substitute sold in Western Sydney (WS202002)

A cluster of lead poisoning in Western Sydney was investigated by the local public health unit in April. The index case was an elderly woman of Sri Lankan background, who was initially notified to public health with an elevated blood lead level of 69.2ug/dL (ref range <5 µg/dL). She was admitted to hospital with investigation of abdominal pain and further clinical investigations showed that she had stippling of basophils on her blood film; a sign strongly suggestive of lead poisoning.

An environmental investigation was initiated, and all family members within the household were advised to be tested for elevated blood lead levels. These five family members were all shown to have elevated blood lead levels, and these levels were proportional to the amount of time spent at the index case's house.

This finding prompted environmental health officers to conduct two site visits to the family home. At the second home visit, seven samples of commonly used spices and food colourings which were used frequently for cooking were collected and submitted to the National Measurement Institute (NMI) for analysis.

A saffron substitute product, which was kept by the index case in an unlabelled jar and used frequently in her cooking, was found to contain 65% lead. The original bottle was obtained by the officers and was resubmitted for further sampling. The second analysis test showed 79% lead, which indicated that the mixing of the lead contaminate in the bottle was not uniform.

Based on the information that was provided by the index case, the saffron substitute may have been purchased from a continental grocer in Western Sydney. An authorised officer from NSW Health attended several continental grocer shops to determine if they were retailing products of interest. Products were identified on shelves in five local stores and eight samples were purchased and submitted to the NMI. All samples returned lead concentration levels of <1mg/kg.

The potential of post-purchase contamination was also investigated, but was ruled out as a possible source of lead poisoning. The public health unit actively sought reports

of similar lead poisoning cases with possible links to the same product, however none were identified.

***Salmonella* Bareilly linked to a sushi chain (NSW202001)**

Two spatio-temporal clusters of *Salmonella* Bareilly were noted in 2020; the first was in February with 21 cases and the second was in June with 6 cases. Investigations initially commenced in March with interviews attempted for all cases using the *Salmonella* Hypothesis Generating Questionnaire (SHGQ). Of the sixteen interviewed, seven cases had reported eating at different venues of the same sushi chain throughout NSW.

The NSW Food Authority initiated an environmental investigation. The central kitchen for the sushi franchise was inspected and samples collected. No significant issues that could have resulted in the outbreak were identified and *Salmonella* was not detected in any swab or sample. The supplier of raw seafood products traced back to Tasmania and details were provided to the Tasmanian food safety regulator for further investigation. No clear source was found, and cases soon returned to expected background rates.

The investigation was re-opened in June when *S. Bareilly* notifications increased again. In the second cluster, half of the cases were from metropolitan Sydney and half were from regional NSW. Median age 52 years old (age range 11 – 75 years old), 33% male. Interviews were completed

for five cases; of which, two had also eaten from the same sushi chain implicated in the first cluster. At the same time that this epidemiological investigation was conducted, several samples from a NSW egg farm were positive for *S. Bareilly*.

Whole genome sequencing was conducted on all human isolates from the February and June clusters, and from environmental isolates originating from the egg farm. Sequencing results tied the two spatio-temporal clusters together through a genetic relationship (SBAR-20-0001), with 15/21 cases in the February cluster and 5/6 cases in June cluster found to be closely related to each other. Of these 20 clustered cases, 8 cases had reported eating at the previously investigated sushi outlet across the two time periods.

The 19 environmental isolates sequenced from the egg farm clustered into two separate strains but did not match any of the human infections (6 x SBAR-20-0002, 12 x SBAR-20-0003, 1 x not clustering). The source of infection linked to the sushi venue remains unknown.

Institutional gastrointestinal outbreaks

From 1 April to 30 June 2020, a total of 33 outbreaks of suspected viral gastrointestinal illness in institutions were reported in NSW affecting at least 257 people (Table 4). This represents a decrease of 77% compared to the average number of outbreaks reported during the same quarter from 2015 to 2019 (n=144), and a decrease of 87% compared to the mean number of people affected as a result of the gastroenteritis outbreaks during the same quarter from 2015 to 2019 (n=1958).

Of the 33 outbreaks, 11 (33%) occurred in child care centres, 20 (61%) in aged care facilities, one (3%) in a hospital and one (3%) in other type of facility (Table 4). The number of outbreaks during quarter 2 was lower than the five year quarterly average across all institution types: outbreaks in child care centres were 87% below average, outbreaks in hospitals were 91% below average, and outbreaks in aged care facilities were 60% below average. (Figure 4). This is largely thought to be attributed to social

distancing and hand hygiene measures implemented in response to the coronavirus pandemic.

Overall, 2% of staff members and 9% of non-staff became sick during gastroenteritis outbreaks in quarter 2 (Table 6). The highest attack rate for gastrointestinal disease for staff was in childcare centres (6%) and for non-staff was in hospitals (30%). Outbreaks lasted six days on average (Table 5).

One or more stool samples were collected in 18 (55%) of the outbreaks. Norovirus was identified in 2 (11%) of these outbreaks. The majority of results of the other samples were negative, or not reported (Table 5).

Public health units monitor gastroenteritis outbreaks in institutions and provide advice on control measures.

Figure 4. Number of reported outbreaks of gastrointestinal illness in institutions, quarter 2 2020 compared to the 5 year quarterly average, by month and facility type

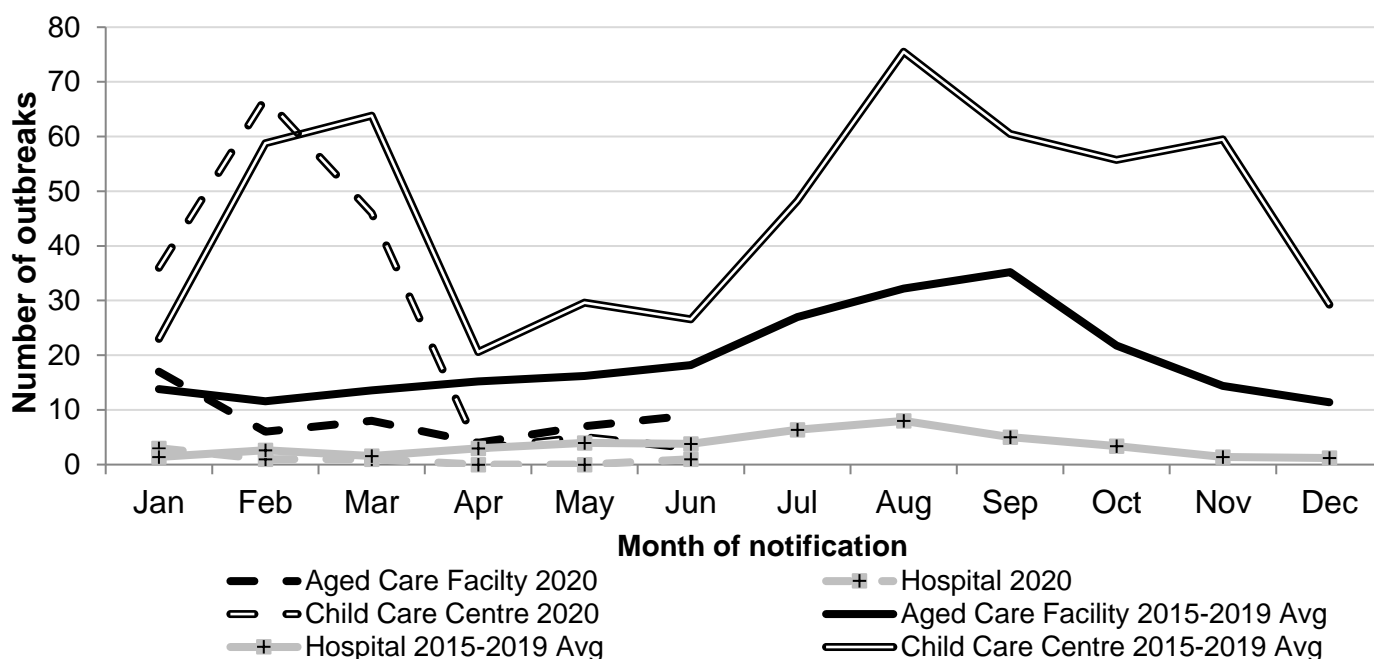


Table 4. Outbreaks of gastroenteritis in institutions reported in NSW, quarter 2 2020, by local health district²

Facility type	Q2 2020	HNE	IS	M	MNC	NBM	NNSW	NS	SES	SNSW	SWS	SYD	WNSW	WS	NSW
ACF	No. of outbreaks	3	2	0	1	2	0	4	2	1	2	0	3	0	20
	Staff affected	1	2	0	6	0	0	9	1	3	0	0	7	0	29
	Non-staff affectede	10	19	0	4	9	0	43	5	5	6	0	30	0	140
CCC	No. of outbreaks	0	1	1	0	0	0	2	5	0	1	0	0	1	11
	Staff affected	0	0	0	0	0	0	0	5	0	1	0	0	3	9
	Non-staff affectede	0	7	3	0	0	0	9	26	0	3	0	0	13	61
Hospital	No. of outbreaks	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	Staff affected	0	0	0	0	0	0	0	3	0	0	0	0	0	3
	Non-staff affectede	0	0	0	0	0	0	0	6	0	0	0	0	0	6
Other ¹	No. of outbreaks	0	0	1	0	0	0	0	0	0	0	0	0	0	1
	Staff affected	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Non-staff affectede	0	0	9	0	0	0	0	0	0	0	0	0	0	9

¹ Other= military base

² SYD, NNSW, CC and FW did not report any outbreaks of gastroenteritis in institutions in this period

Table 5. Outbreaks of gastroenteritis in institutions reported in NSW, quarter 2 2020, by facility type

Setting	No of Outbreaks (n)	Staff Affected (n: attack rate)	Non-staff affected (n: attack rate)	Average duration of outbreak (days)	Outbreaks with stool collected (n: %)	Outbreaks with pathogen found (n: pathogen found)
ACF	20	29: 1%	140: 9%	6	15: 75%	2: norovirus
CCC	11	9: 6%	61: 10%	7	2: 18%	-
Hospital	1	3: UNK	6: 30%	9	1: 100%	-
Other ¹	1	0: N/A	9: 18%	3	0: N/A	-
Total	33	41: 2%	216: 9%	6	18: 55%	2: norovirus

¹ Other= military base

METHODS

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

Notifiable enteric diseases in NSW

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

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

Data sources for this report

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

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

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

Methods

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

The counts of each notifiable enteric disease for Quarter 2 2020 were compared with the average annual count for the same quarter for the years 2015 to 2019 using SAS Enterprise Guide and MS Excel at Health Protection NSW.

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

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

GLOSSARY

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