

California Norovirus Laboratory Network (NLN) Triannual Report for October 2018 through January 2019

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1 INTRODUCTION

The triannual NLN report issued by the VRDL is intended to inform NLN member laboratories and California local health departments and partners about current norovirus-relevant topics, particularly about circulating and emerging strains detected from California outbreaks of acute viral gastroenteritis tested by NLN labs. In addition to norovirus, this report includes information about norovirus-negative gastroenteritis outbreaks characterized by the VRDL, including rotavirus, sapovirus, astrovirus, and gastroenteric adenoviruses 40 and 41. Outbreaks in this report are defined as being two or more cases of acute gastroenteritis linked by time, person, and place. Laboratory-confirmed outbreaks are those in which a gastroenteric viral agent has been detected by a laboratory method (e.g., PCR) from two or more outbreak patient specimens.

2 NOROVIRUS ACTIVITY, OCTOBER 2018 THROUGH JANUARY 2019

From October 2018 through January 2019, the NLN reported 63 suspected norovirus outbreaks to VRDL. Of the 63 suspected outbreaks, 40 (63%) were confirmed by real-time RT-PCR (Table 1). As shown in Table 1, more outbreaks were associated with Genogroup II (GII) viruses (35/40, 88%) than with Genogroup I (GI) viruses (5/40, 12%). Of the 35 GII outbreaks reported by the NLN from October 2018 through January 2019, 26 outbreaks (74%) were genotyped. The predominant genotype identified was **GII.P16-GII.4 Sydney** (17/26, 65%), as shown in Table 2. Butte County reported the most laboratory-confirmed outbreaks with ten, followed by Orange County with five (Figure 1, Table 3).

Last season, between October 2017 and January 2018, the NLN reported 74 suspected outbreaks, of which 52 (70%) were confirmed by real-time RT-PCR. GI and GII were associated with 5 and 47 outbreaks, respectively (Figure 2). **GII.P16-GII.4 Sydney** was also the predominant genotype from October 2017 through January 2018: 35 (74%) out of 47 GII outbreaks reported by the NLN were genotyped by VRDL, and **GII.P16-GII.4 Sydney** was identified in 43% (15/35) of the GII outbreaks.

Long-term care facilities (LTCFs) are settings where specimens are more easily obtained for laboratory confirmation of suspect norovirus outbreaks than other settings (such as schools or restaurants). There were 22 confirmed LTCF outbreaks out of the 40 confirmed norovirus outbreaks reported by NLN labs from October 2018 through January 2019. More outbreaks from LTCFs were genotyped than any other setting (16 of the 30 genotyped norovirus outbreaks from October 2018 through January 2019 were from LTCFs, as shown in Figure 4).

3 NOROVIRUS OUTBREAKS AT BUTTE COUNTY EMERGENCY SHELTERS — NOVEMBER 2018

In November 2018, several norovirus outbreaks occurred at evacuation shelters in Butte and Glenn Counties that were set up in response to the Camp Fire. Fifty-two patient specimens from nine evacuation shelters tested positive for norovirus GII by Butte County Public Health Laboratory and were forwarded to VRDL for genotyping. Forty-six of these were identified as **GII.P16-GII.4 Sydney**.

One of the evacuation shelters had a second norovirus outbreak in January 2019. Four specimens tested positive for norovirus GI from this outbreak and were identified as **GI.P4-GI.4** by VRDL.

4 MULTI-COUNTY OUTBREAK OF NOROVIRUS ASSOCIATED WITH OYSTERS – DECEMBER 2018 TO JANUARY 2019

A multi-county outbreak of norovirus associated with the consumption of raw oysters was reported during January 2019. Patient specimens from several counties (Alameda, Contra Costa, Sacramento, and San Francisco) were identified as norovirus GI positive at local county public health laboratories and submitted to VRDL for genotyping as part of this outbreak investigation. VRDL characterized virus from five patient specimens as Norovirus **GI.P4-GI.5**.

5 TESTING OF NOROVIRUS-NEGATIVE OUTBREAKS

We encourage our NLN partners to submit norovirus-negative outbreaks to VRDL for further testing to capture and characterize non-norovirus viral gastroenteritis outbreaks. In December 2018, Monterey County Public Health Laboratory submitted specimens to VRDL from a norovirus-negative gastroenteritis outbreak at a long-term care facility that occurred in November 2018. VRDL was able to detect sapovirus by real-time RT-PCR in 2 of 4 patient specimens from this outbreak. Furthermore, we were able to type the virus as **Sapovirus GI.2**.

**Table 1: Norovirus Outbreak Testing Reported by the NLN
October 2018—January 2019**

Month	Outbreaks Tested	Positive Outbreaks	Total Specimens	Positive Specimens	GI OB	GII OB
October	10	4	102	18	0	4
November	18	15	167	91	0	15
December	15	10	168	56	1	9
January	20	11	137	51	4	7
Total	63	40	574	216	5	35

Table 2: Norovirus Genotypes Identified* from Reported Norovirus Outbreaks, October 2018-January 2019 (N = 30)

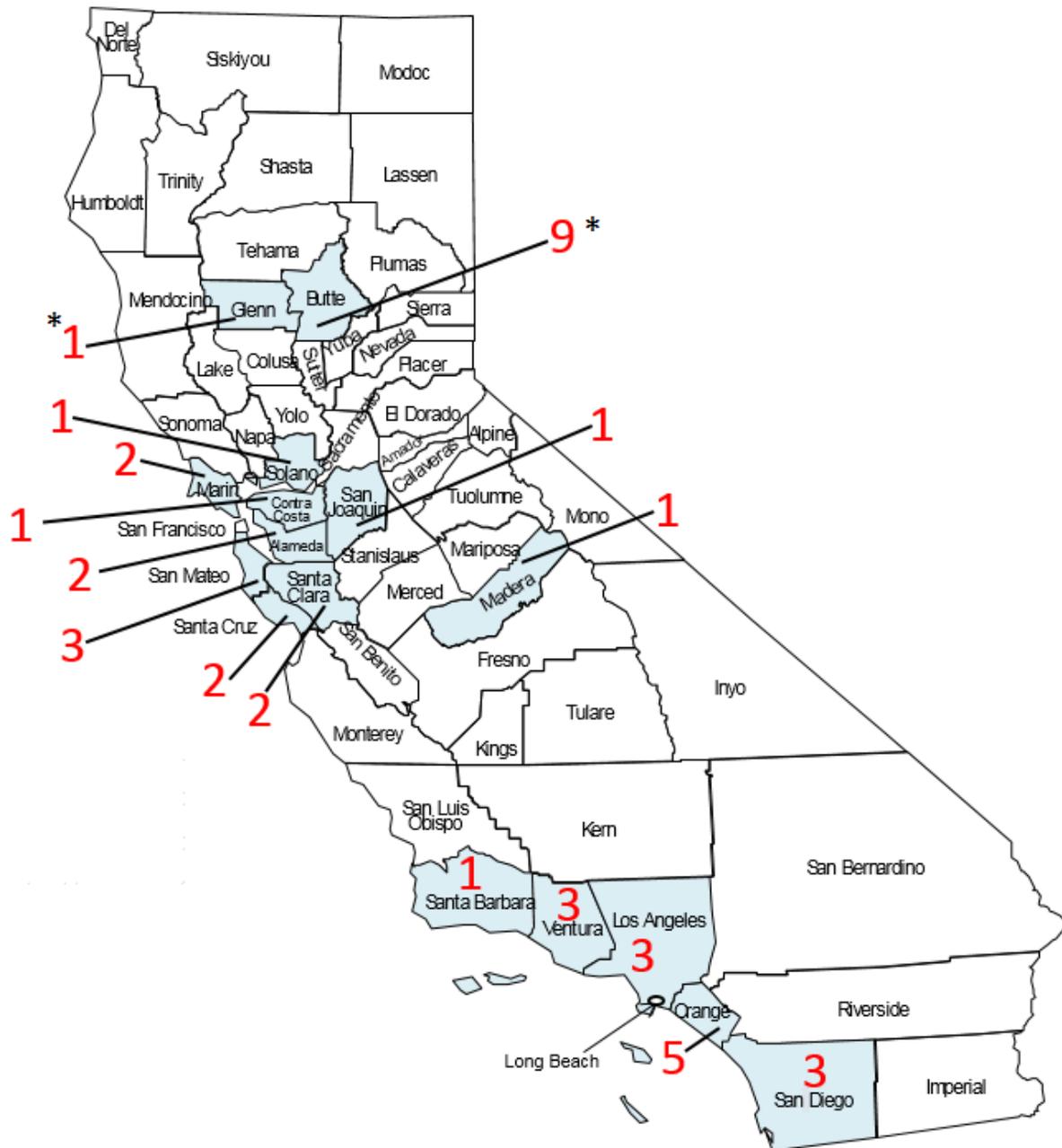
Norovirus Genotypes	Number of OBs
GI.P4-GI.4	1
GI.P4-GI.5	3
GII.P4 New Orleans-GII.4 Sydney	1
GII.P7-GII.6	2
GII.P7-GII.7	3
GII.P12-GII.3	1
GII.P17-GII.17	1
GII.P16-GII.4 Sydney <i>(aka "GII.4 Sydney 2015", currently the predominant circulating norovirus variant)</i>	17
GII.P22-GII.5	1
Total	30

*Please note that VRDL is not able to genotype every OB

**Table 3: Laboratory-Confirmed Norovirus Outbreaks Reported by the NLN,
October 2018-January 2019**

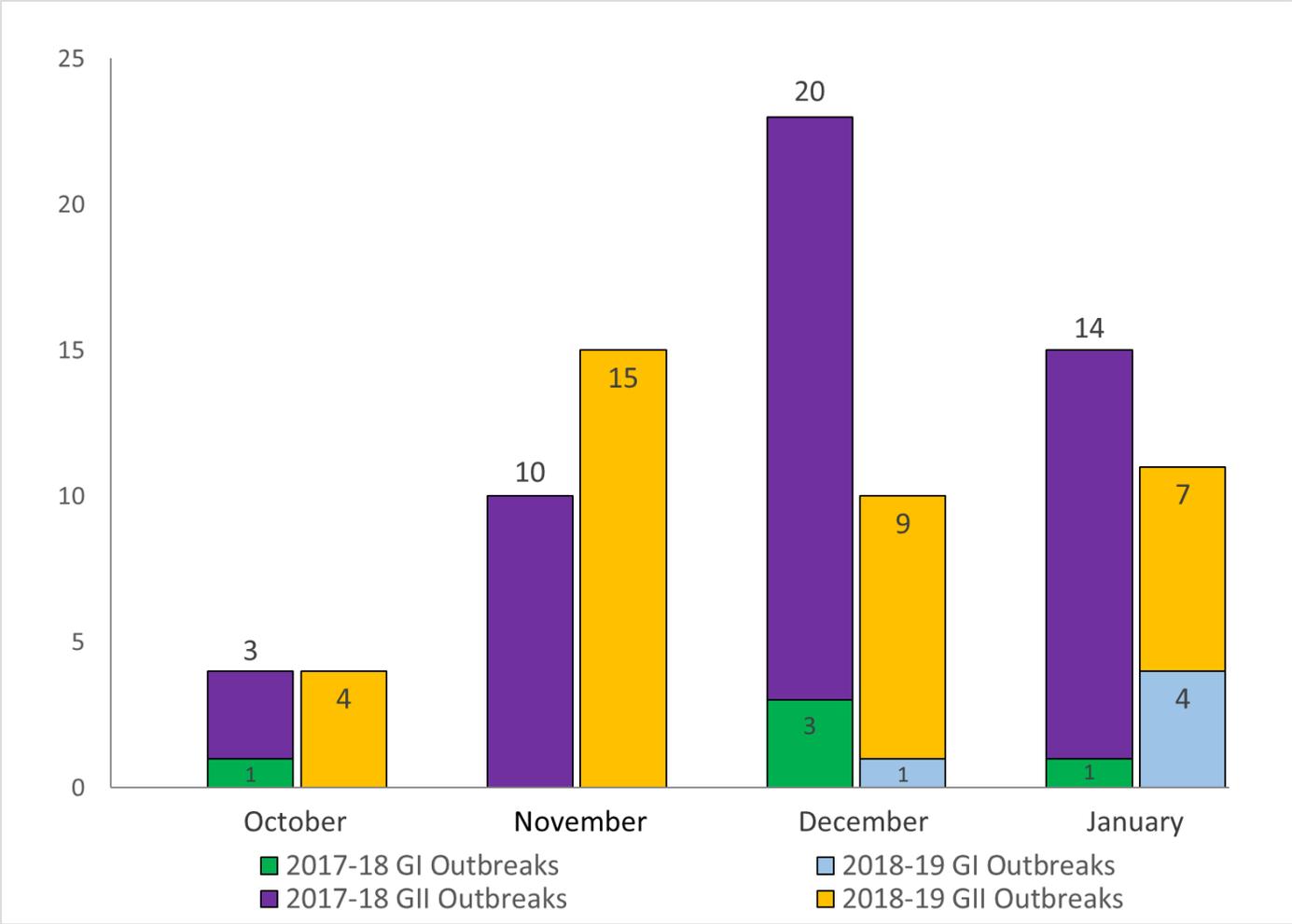
Public Health NLN Lab	Total Suspect Norovirus OBs Reported by NLN	Total Laboratory- Confirmed Norovirus OBs
Alameda	2	2
Butte (including Glenn Co.)	12	10
Contra Costa	1	1
Humboldt	0	0
Long Beach	0	0
Los Angeles	16	3
Monterey	1	0
Napa-Solano-Yolo-Marin	3	2
Orange	6	5
Riverside	0	0
Sacramento	1	0
San Bernardino	0	0
San Diego	5	3
San Joaquin	3	1
San Luis Obispo	0	0
San Mateo	3	3
Santa Barbara	1	1
Santa Clara	2	2
Shasta	0	0
Sonoma	0	0
Tulare	0	0
Ventura	3	3
VRDL (for Madera, Marin, Santa Cruz)	4	4
Total	63	40

Figure 1: Number of Laboratory-Confirmed Norovirus Outbreaks Identified by Local Health Jurisdiction, October 2018 — January 2019 (N = 39)

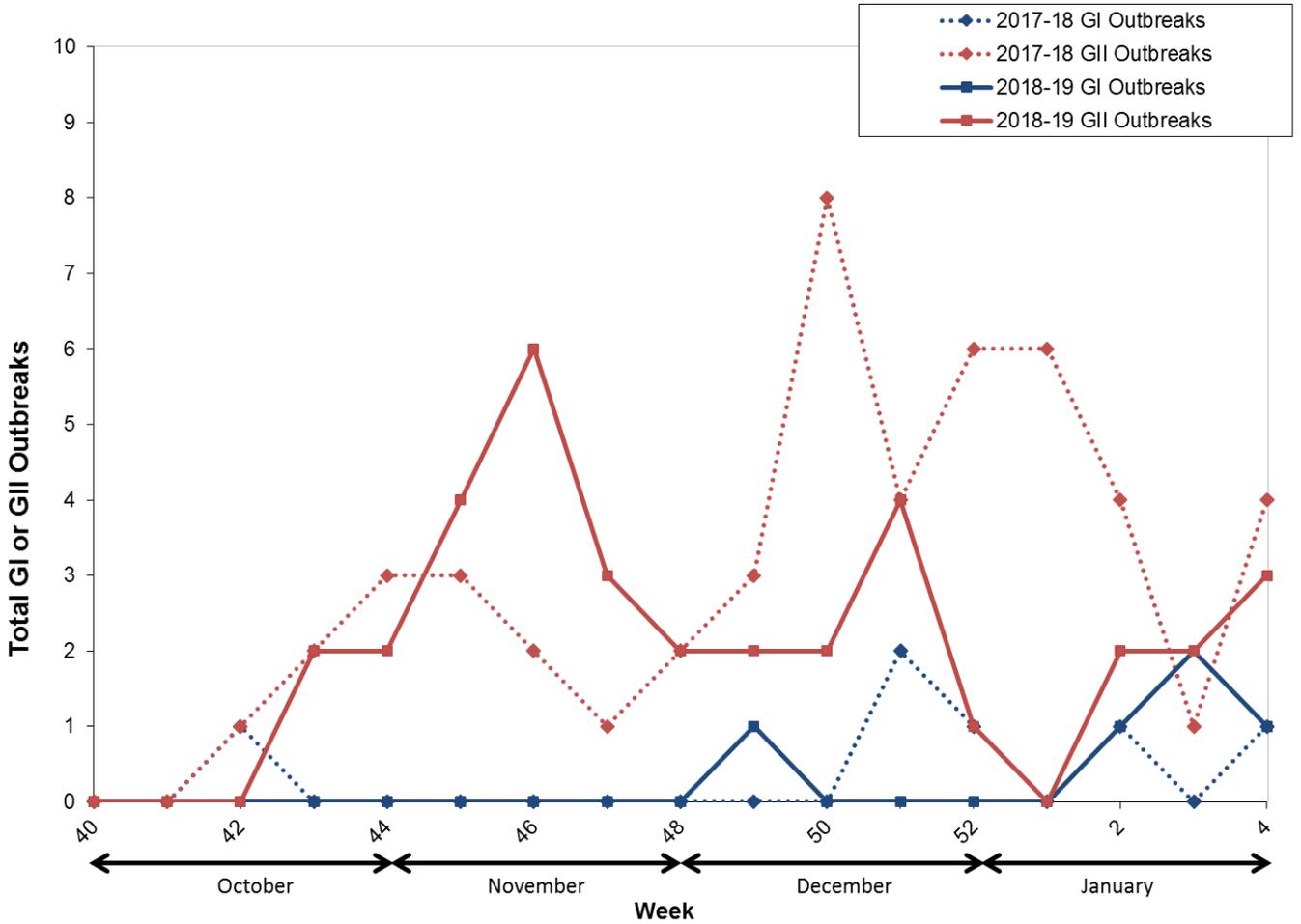


*Five out of nine Butte County outbreaks and the Glenn County outbreak were related to norovirus outbreaks at Camp Fire evacuation shelters.

Figure 2: Laboratory-Confirmed Norovirus Outbreaks Reported by the NLN. Comparison of 2017-18 and 2018-19 Seasonal Incidence by Month, October through January



**Figure 3: Laboratory-Confirmed Norovirus Outbreaks Reported by the NLN.
Comparison of 2017-18 and 2018-19 Seasonal Incidence
by Week for October through January**



**Figure 4: Norovirus Genotypes by Setting for Outbreaks (OBs) Tested by the NLN
October 2018 — January 2019 (N=40)**

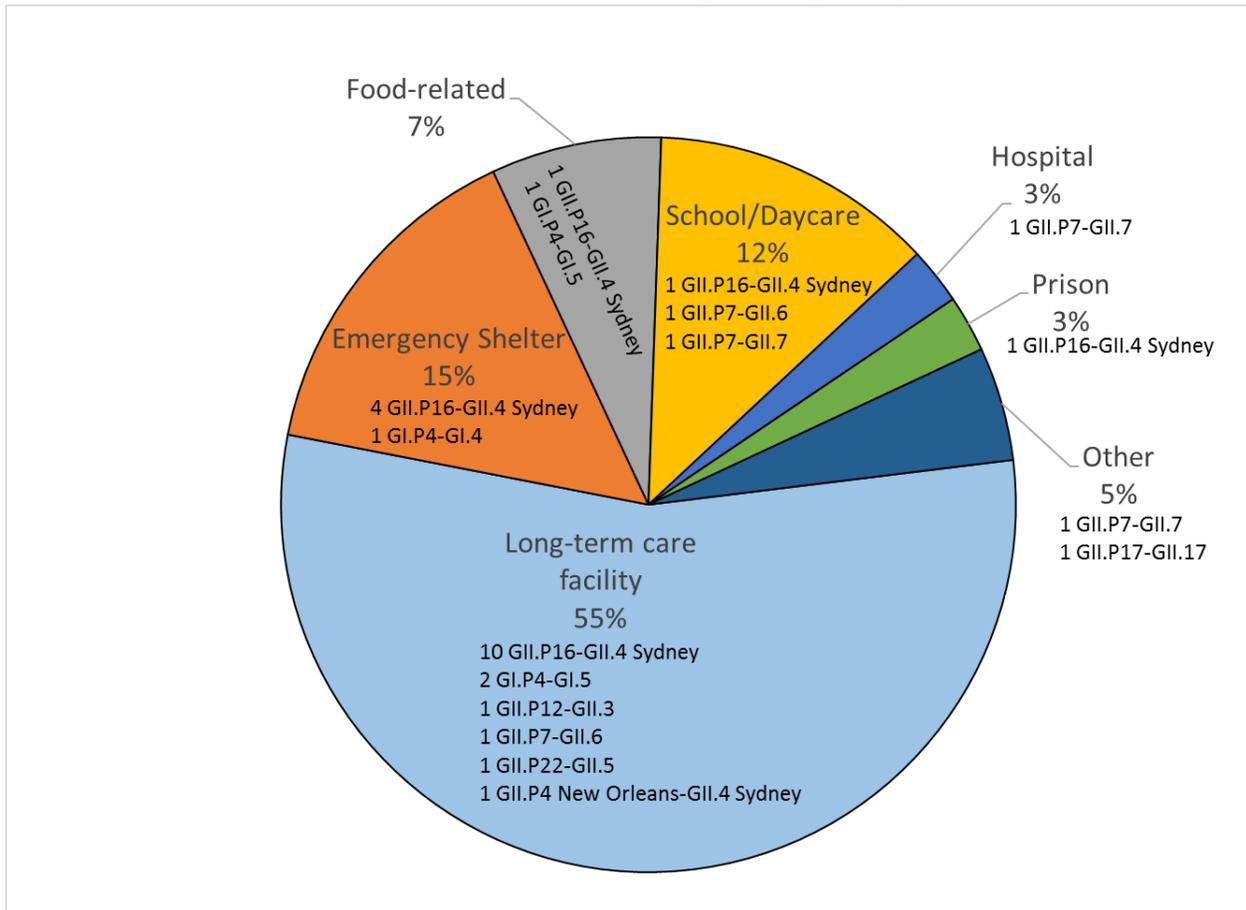
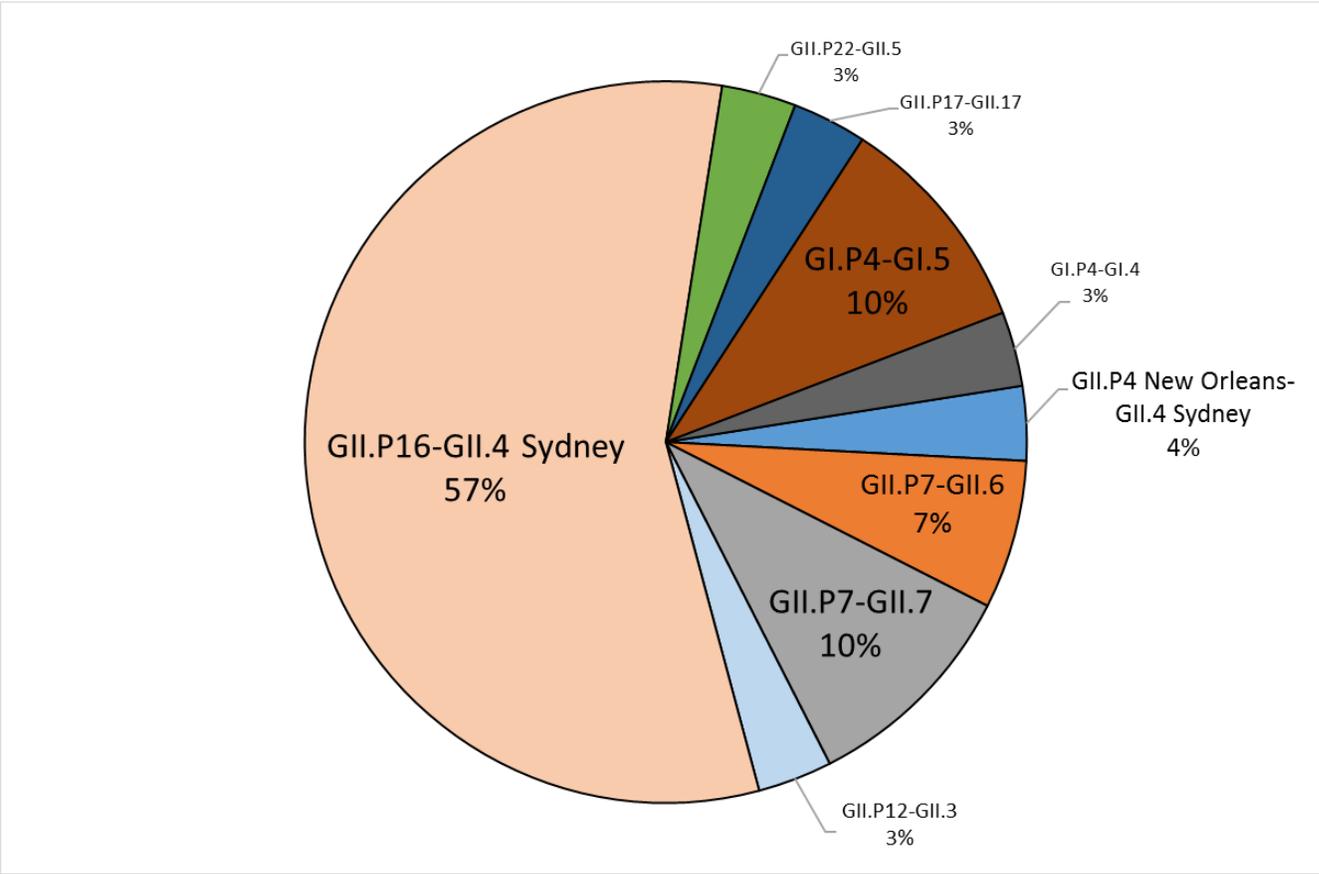


Figure 5: Norovirus Genotypes Identified* from Reported Norovirus Outbreaks, October 2018-January 2019 (N = 30)



**Please note that VRDL is not able to genotype every OB*

6 REMINDERS

1. Please send a minimum of **TWO positive stool specimens and their nucleic acid extracts per outbreak** to VRDL for norovirus genotyping; **more than TWO is preferred**. Please submit one specimen and its corresponding nucleic acid extract per patient.
2. Please submit norovirus-negative outbreak specimens (defined as at least three norovirus-negative specimens) to VRDL for further testing.
3. Please provide CalREDIE identifiers whenever possible. VRDL will provide, upon request, real-time RT-PCR primers and probe and controls.
4. VRDL requires the **VRDL General Purpose Laboratory Submittal Form** for all specimens. Please include a Gastroenteritis Outbreak Information Summary Form with the individual VRDL Submission forms. Please refer to the “NOROVIRUS TESTING QUICK SHEET” on the VRDL’s website for further instructions. All necessary VRDL forms can be found at the [VRDL Specimen Submittal Forms website](#).
5. VRDL can perform norovirus PCR testing if your laboratory lacks the resources. Please work with your environmental health colleagues, epidemiologists, and health officers to promote laboratory investigation of suspect acute viral gastroenteritis outbreaks.
6. Please contact Chao Pan (Chao-Yang.Pan@cdph.ca.gov) if you require technical support.
7. Please send your jurisdiction’s weekly NLN report to Alice Chen (Alice.Chen@cdph.ca.gov).

The next California NLN Triannual Report will be published in July 2019.