

# California Norovirus Laboratory Network (NLN) Triannual Report for June 2019 through September 2019

**California Department of Public Health  
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Respiratory and Gastroenteric Diseases Section**

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## INTRODUCTION

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The triannual NLN report issued by the VRDL is intended to inform NLN member laboratories and California local health departments and partners about circulating and emerging norovirus strains detected from outbreaks of acute viral gastroenteritis tested by the 24 NLN laboratories throughout California. 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.

CaliciNet is a national norovirus outbreak surveillance network of federal, state, and local public health laboratories launched in 2009 by the Centers for Disease Control and Prevention (CDC) to collect information about norovirus strains associated with gastroenteritis outbreaks in the United States. CaliciNet laboratories in California include the VRDL, Los Angeles County Public Health Laboratory (PHL), Orange County PHL, and San Diego County PHL. CaliciNet laboratories are certified by CDC and have the capability to determine the genogroup and genotype of noroviruses by DNA sequencing,

for source tracing and outbreak investigation support. CaliciNet laboratories in California include the VRDL, Los Angeles County Public Health Laboratory (PHL), Orange County PHL, and San Diego County PHL.

## UPDATED NOROVIRUS GENOTYPING NOMENCLATURE

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The VRDL performs dual-region typing of the polymerase and capsid genes by sequence analysis. The dual-region typing results are reflected in the strain type name of the virus. To simplify naming strains based on the two regions sequenced, the nomenclature convention for noroviruses has been updated. An example is as follows: the norovirus strain previously designated as “GII.P16-GII.4 Sydney” (Genogroup II Polymerase type 16 and Genogroup II Genotype 4 Sydney Capsid), will now be designated as **GII.4 Sydney[P16]**.

## NOROVIRUS ACTIVITY, JUNE - SEPTEMBER 2019

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As shown in Table 1, from June through September of 2019, the NLN reported 20 suspected norovirus outbreaks to the VRDL. Of the 20 suspected outbreaks, 15 (75%) were confirmed by real-time RT-PCR. Eight outbreaks were associated with Genogroup II (GII) viruses (53%) and seven with Genogroup I (GI) viruses (47%). Seven of the 8 (88%) GII outbreaks and 6 of the 7 (86%) GI outbreaks were successfully genotyped (Table 2). Please note that not all norovirus outbreaks are able to be genotyped, as sequencing is occasionally unsuccessful. Orange County reported the most laboratory-confirmed outbreaks with three, followed by Los Angeles County and Sacramento County with two (Figure 1 and Table 3). Long-term care facilities accounted for the majority of the lab-confirmed outbreaks (6 of 15 outbreaks, or 40%) reported by NLN laboratories between June and September 2019 (Figure 2).

Norovirus activity during this time period is generally low. During this time period last season, GII viruses were detected in 9 of 12 (75%) confirmed outbreaks (see Figure 3), with GII.4 Sydney[P16] (previously designated GII.P16-GII.4 Sydney) being the predominant genotype. Interestingly, this summer season showed 7 of 15 (47%) confirmed outbreaks associated with GI viruses (see Table 2). This is a higher percentage compared to June – September of last season, where only 3 of 12 (25%) of the confirmed outbreaks were associated with GI viruses (see Figure 3). Moreover, the predominant genotype detected for the current time period was a GI virus, the GI.3[P3] genotype, detected in 4 of 13 (31%) genotyped outbreaks (see Figure 4).

## NOROVIRUS GII OUTBREAK AT AN ELEMENTARY SCHOOL – AUGUST 2019

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A norovirus outbreak in a San Bernardino County school district was reported in August 2019, involving over 100 cases from different schools within the district. San Bernardino County Public Health Laboratory identified norovirus GII in four patients’ specimens from one of the schools and submitted the specimens to the VRDL for genotyping as

part of the outbreak investigation. The VRDL characterized the virus from three patient specimens as GII.3[P12], and virus from one specimen was genotyped as GII.5[P22].

## TESTING OF NOROVIRUS-NEGATIVE OUTBREAKS

Three norovirus-negative outbreaks were tested from June through September 2019. No gastroenteric viruses were identified in those outbreaks.

We encourage our NLN partners to submit a minimum of 3 patient specimens from norovirus-negative outbreaks to the VRDL to test for non-norovirus viral gastroenteric pathogens, including rotavirus, sapovirus, astrovirus, and gastroenteric adenoviruses 40 and 41.

**Table 1: Norovirus Outbreak (OB) Testing Reported by the NLN  
June - September 2019**

Month	Outbreaks Tested	Positive Outbreaks	Total Specimens	Positive Specimens	GI OB	GII OB
June	7	4	54	17	1	3
July	3	3	32	16	1	2
August	6	6	77	20	5	1
September	4	2	46	8	0	2
<b>Totals</b>	<b>20</b>	<b>15</b>	<b>209</b>	<b>61</b>	<b>7</b>	<b>8</b>

**Table 2: Norovirus Genotypes Identified\* from Reported Norovirus Outbreaks  
June - September 2019 (N = 13)**

<b>Norovirus Genotypes</b>	<b>Number of OBs</b>
GI.3[P3]	4
GI.5[P4]	2
GII.3[P12]	1†
GII.2[P16]	3
GII.4 Sydney[P16]	2
GII.6[P17]	1
<b>Total</b>	<b>13</b>

\*Please note that not all outbreaks can be genotyped. The genotyping results above were determined by the VRDL for 8 outbreaks, by the Los Angeles County PHL for 2 outbreaks, and by the Orange County PHL for 3 outbreaks.

† GII.5[P22] was identified in 1 specimen from the GII.3[P12] outbreak.

**Table 3: Laboratory-Confirmed Norovirus Outbreaks Reported by the NLN  
June —September 2019**

<b>Public Health NLN Lab</b>	<b>Total Suspected Norovirus OBs Reported by NLN</b>	<b>Total Laboratory-Confirmed Norovirus OBs</b>
Alameda	1	1
Butte	0	0
Contra Costa	1	1
Humboldt	0	0
Long Beach	0	0
Los Angeles	3	2
Monterey	0	0
Napa-Solano-Yolo-Marin	1	1
Orange	4	3
Riverside	1	1
Sacramento	2	2
San Bernardino	1	1
San Diego	2	1
San Francisco	1	0
San Joaquin	1	0
San Luis Obispo	1	1
San Mateo	0	0
Santa Barbara	0	0
Santa Clara	0	0
Shasta	0	0
Sonoma	0	0
Tulare	0	0
Ventura	0	0
VRDL (for Santa Cruz Co.)	1	1
<b>Total</b>	<b>20</b>	<b>15</b>

Figure 1: Number of Laboratory-Confirmed Norovirus Outbreaks by County, June — September 2019 (N = 15)

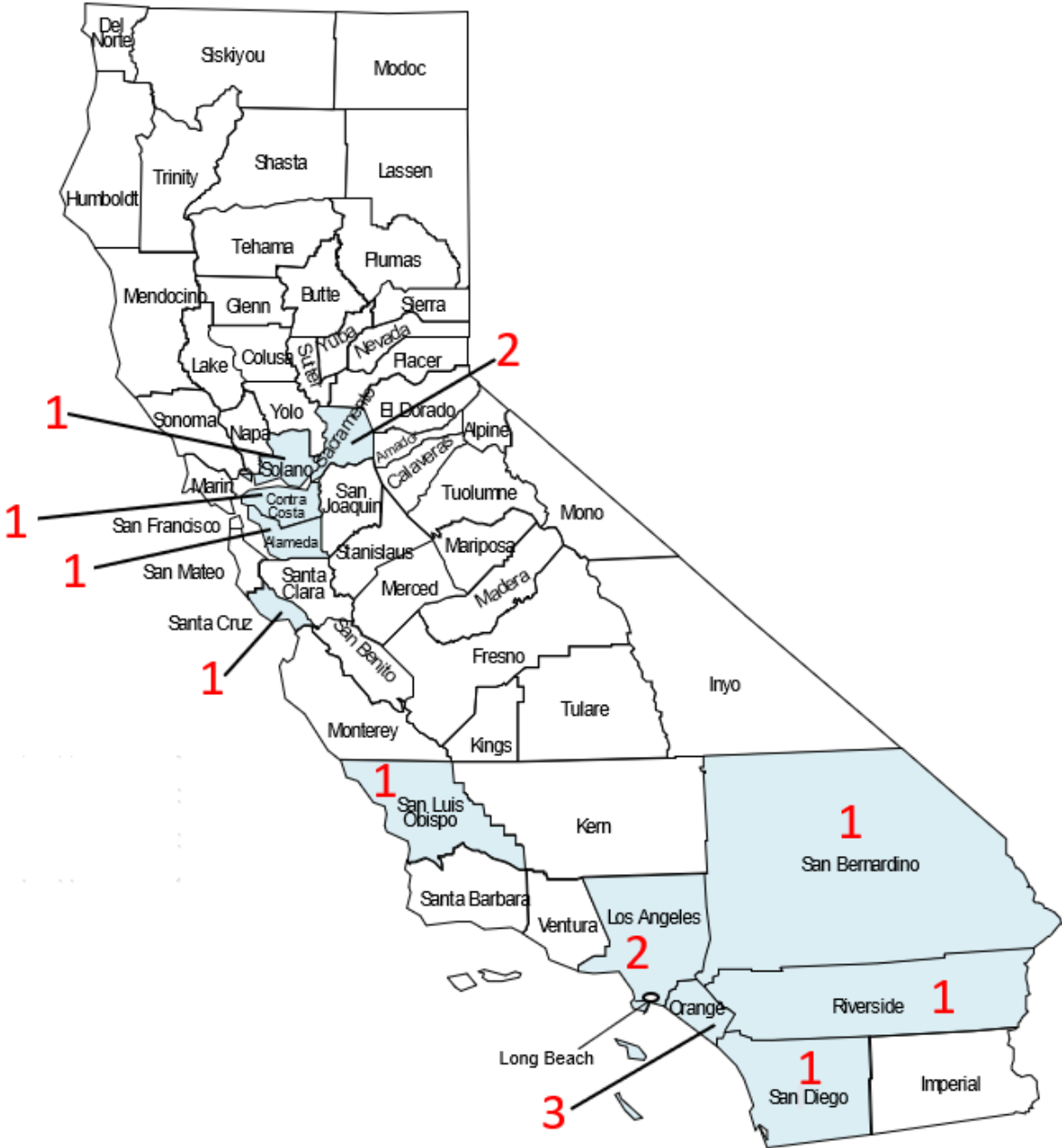
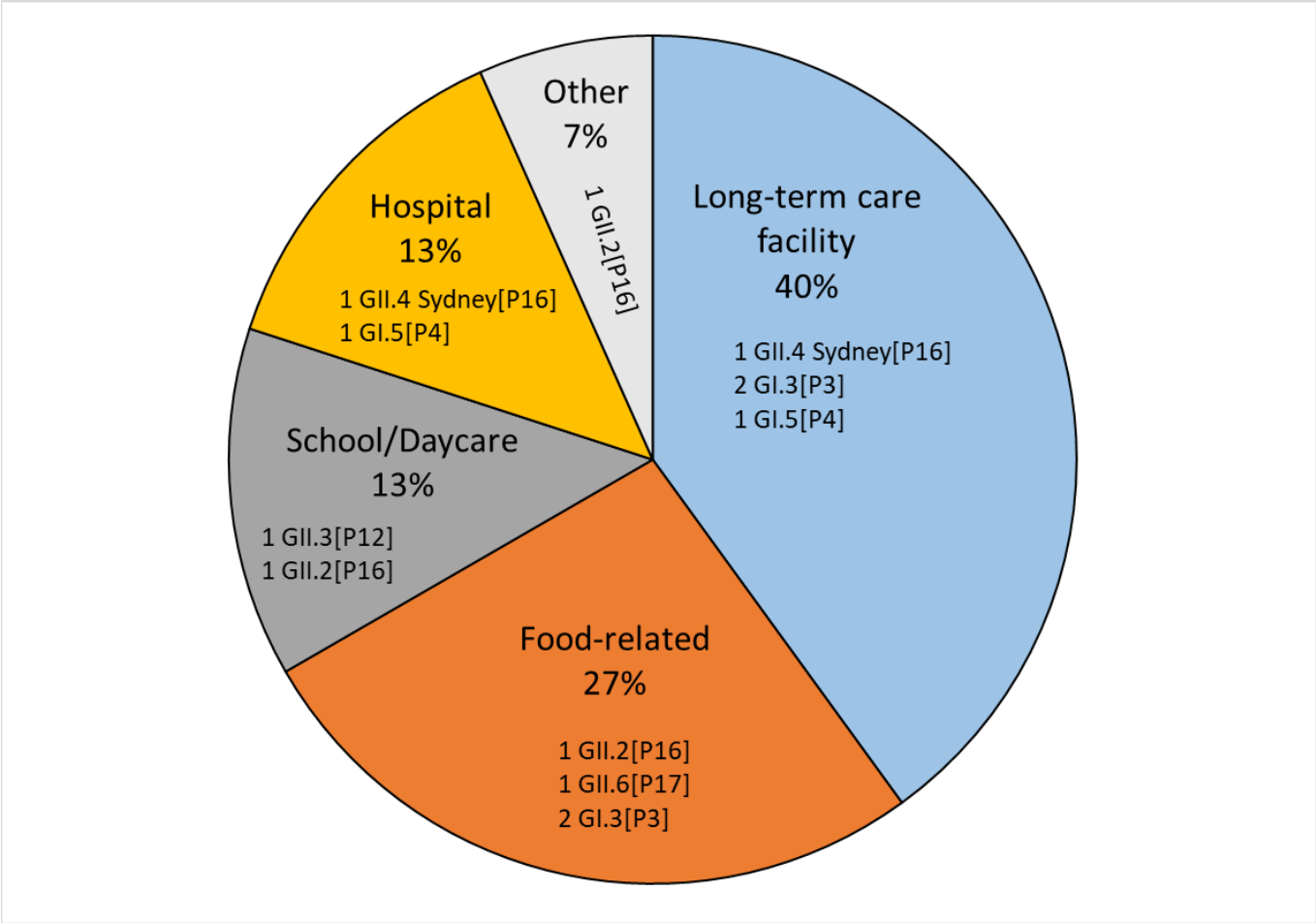
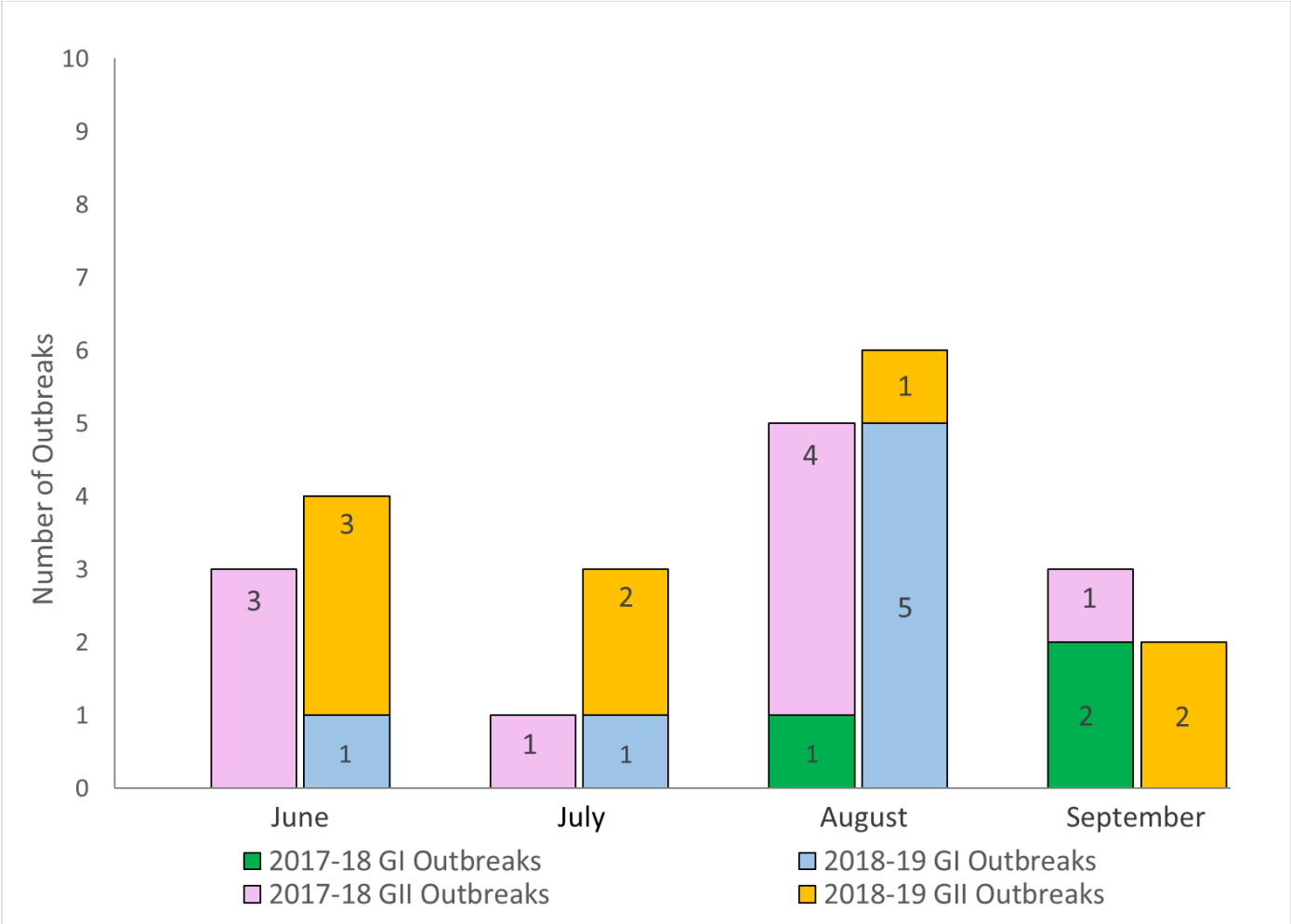


Figure 2: Norovirus Genotypes by Setting for Outbreaks (OBs) Tested by the NLN February — May 2019 (N=15)

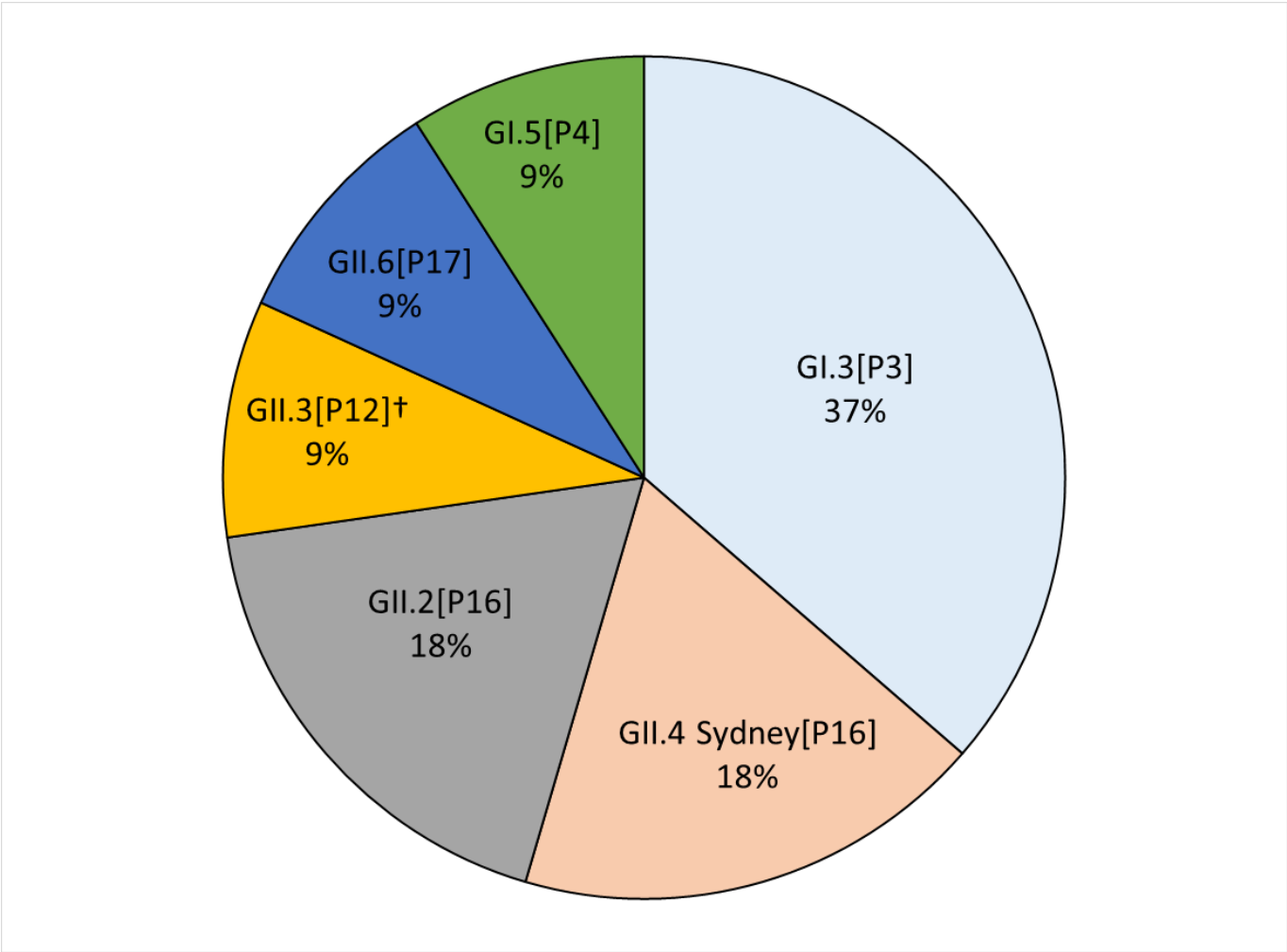


**Figure 3: Number of Laboratory-Confirmed Norovirus Outbreaks Reported by the NLN - Comparison of 2017-18 and 2018-19 Seasonal Incidence by Month, June through September**





**Figure 4: Norovirus Genotypes Identified\* from Reported Norovirus Outbreaks, June – September 2019 (N = 13)**



*\*Please note that not all outbreaks can be genotyped.*

†GII.5[P22] was identified in 1 specimen from a GII.3[P12] outbreak.

## REMINDERS

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1. Please send a minimum of **TWO positive stool specimens, preferably more than two, and their nucleic acid extracts per outbreak** to VRDL (or local health jurisdiction CaliciNet laboratory, if applicable) for norovirus genotyping. Please submit one specimen and its corresponding nucleic acid extract per patient when possible.
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.
4. The 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, including the Gastroenteritis Outbreak Summary Form, can be found at the [VRDL Specimen Submittal Forms website](#).
5. The VRDL will 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. The VRDL will provide, upon request, real-time RT-PCR primers, probe and controls for norovirus PCR. Please contact Chao Pan ([Chao-Yang.Pan@cdph.ca.gov](mailto:Chao-Yang.Pan@cdph.ca.gov)) for more information or if you require technical support.
7. Please send your jurisdiction’s weekly NLN report or questions about specimen submissions to Alice Chen ([Alice.Chen@cdph.ca.gov](mailto:Alice.Chen@cdph.ca.gov)).

***The next California NLN Triannual Report (October 2019-January 2020) will be published in March 2020.***