California Norovirus Laboratory Network (NLN)

Triannual Report for February 2019 through May 2019

California Department of Public Health
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INTRODUCTION

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 for source tracing and outbreak investigation support.

NOROVIRUS ACTIVITY, FEBRUARY - MAY 2019

As shown in Table 1, from February through May of 2019, the NLN reported 36 suspected norovirus outbreaks to VRDL. Of the 36 suspected outbreaks, 28 (78%) were confirmed by real-time RT-PCR and more outbreaks were associated with Genogroup II (GII) viruses (22/28, 79%) than with Genogroup I (GI) viruses (6/28, 21%). Nineteen of the 22 (86%) GII outbreaks and 5 of the 6 (83%) GI outbreaks were successfully genotyped. Unfortunately, not all norovirus outbreaks are able to be genotyped, as sequencing is occasionally unsuccessful. The predominant genotype, detected in 16 of 19 GII outbreaks (84%), was **GII.P16-GII.4 Sydney** (Table 2). San Diego County reported the most laboratory-confirmed outbreaks with seven, followed by Contra Costa County with four (Figure 1 and Table 3).

As usual, long-term care facilities accounted for the majority of lab-confirmed outbreaks (19 of 28 outbreaks or 68%) reported by NLN laboratories between February and May 2019 (Figure 2).

MULTI-COUNTY OUTBREAK OF NOROVIRUS ASSOCIATED WITH OYSTERS – APRIL TO MAY 2019

A multi-county outbreak of norovirus associated with the consumption of raw oysters harvested from a Bay Area commercial oyster farm was reported in April and May of 2019. Patient specimens from four counties (Marin, Monterey, San Francisco, and San Mateo) were identified as norovirus GI positive by NLN member laboratories and submitted to VRDL for genotyping as part of this outbreak investigation. VRDL characterized the virus from four patient specimens using partial polymerase and capsid sequence as norovirus **GI.Pd-GI.3.** All 4 specimens were identical in their polymerase-capsid sequences, suggesting a common source exposure. In this manner, norovirus genotyping is a powerful use of molecular epidemiology to help investigate potential outbreak sources.

TESTING OF NOROVIRUS-NEGATIVE 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
February — May 2019

Month	Outbreaks Tested	Positive Outbreaks	Total Specimens	Positive Specimens	GI OB	GII OB
February	7	7	45	26	0	7
March	13	10	67	31	3	7
April	8	5	26	15	1	4
May	8	6	31	16	2	4
Totals	**36**	**28**	**169**	**88**	**6**	**22**

Table 2: Norovirus Genotypes Identified* from Reported Norovirus Outbreaks
February — May 2019 (N = 24)

Norovirus Genotypes	Number of OBs
GI.P1-GI.1	2
GI.P3-GI.3	1
GI.P4-GI.5	1
GI.Pd-GI.3	1
GII.P7-GII.6	1
GII.P16-GII.2	1
GII.P16-GII.4 Sydney *(aka "GII.4 Sydney 2015", currently the predominant circulating norovirus variant)*	16
GII.P16-GII.12	1
Total	**24**

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

Table 3: Laboratory-Confirmed Norovirus Outbreaks Reported by the NLN February 2019-May 2019

Public Health NLN Lab	Total Suspected Norovirus OBs Reported by NLN	Total Laboratory-Confirmed Norovirus OBs
Alameda	1	1
Butte	1	1
Contra Costa	4	4
Humboldt	1	0
Long Beach	0	0
Los Angeles	3	3
Monterey	0	0
Napa-Solano-Yolo-Marin	3	2
Orange	1	0
Riverside	0	0
Sacramento	1	0
San Bernardino	0	0
San Diego	7	6
San Francisco	0	0
San Joaquin	1	1
San Luis Obispo	0	0
San Mateo	2	2
Santa Barbara	2	1
Santa Clara	1	1
Shasta	0	0
Sonoma	0	0
Tulare (including Fresno, Merced, and Stanislaus Co.)	3	3
Ventura	3	1
VRDL (for Santa Cruz Co.)	2	2
Total	**36**	**28**

Figure 1: **Number of Laboratory-Confirmed Norovirus Outbreaks by County, February — May 2019 (N = 28)**

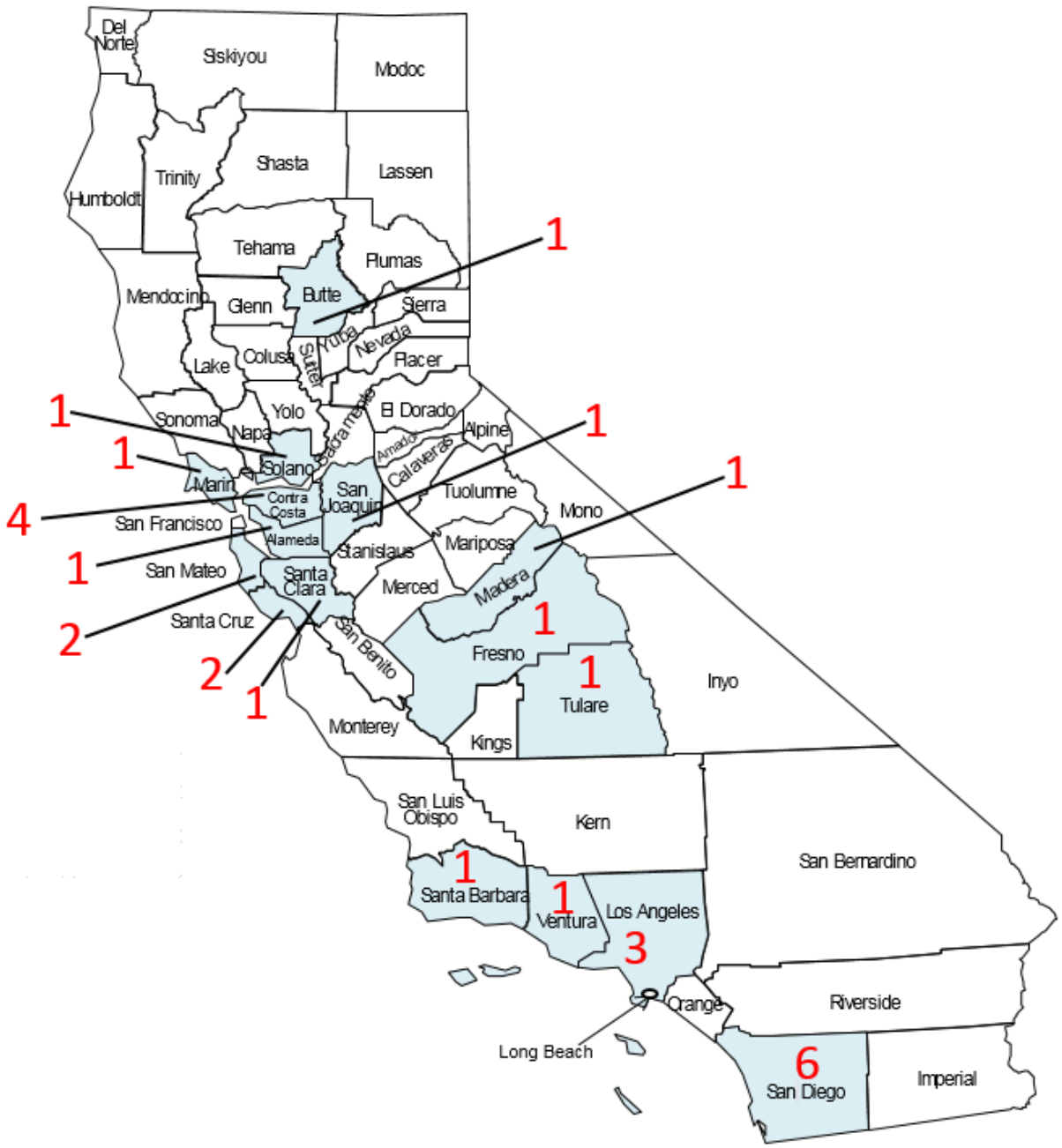


Figure 2: Norovirus Genotypes by Setting for Outbreaks (OBs) Tested by the NLN February — May 2019 (N=28)

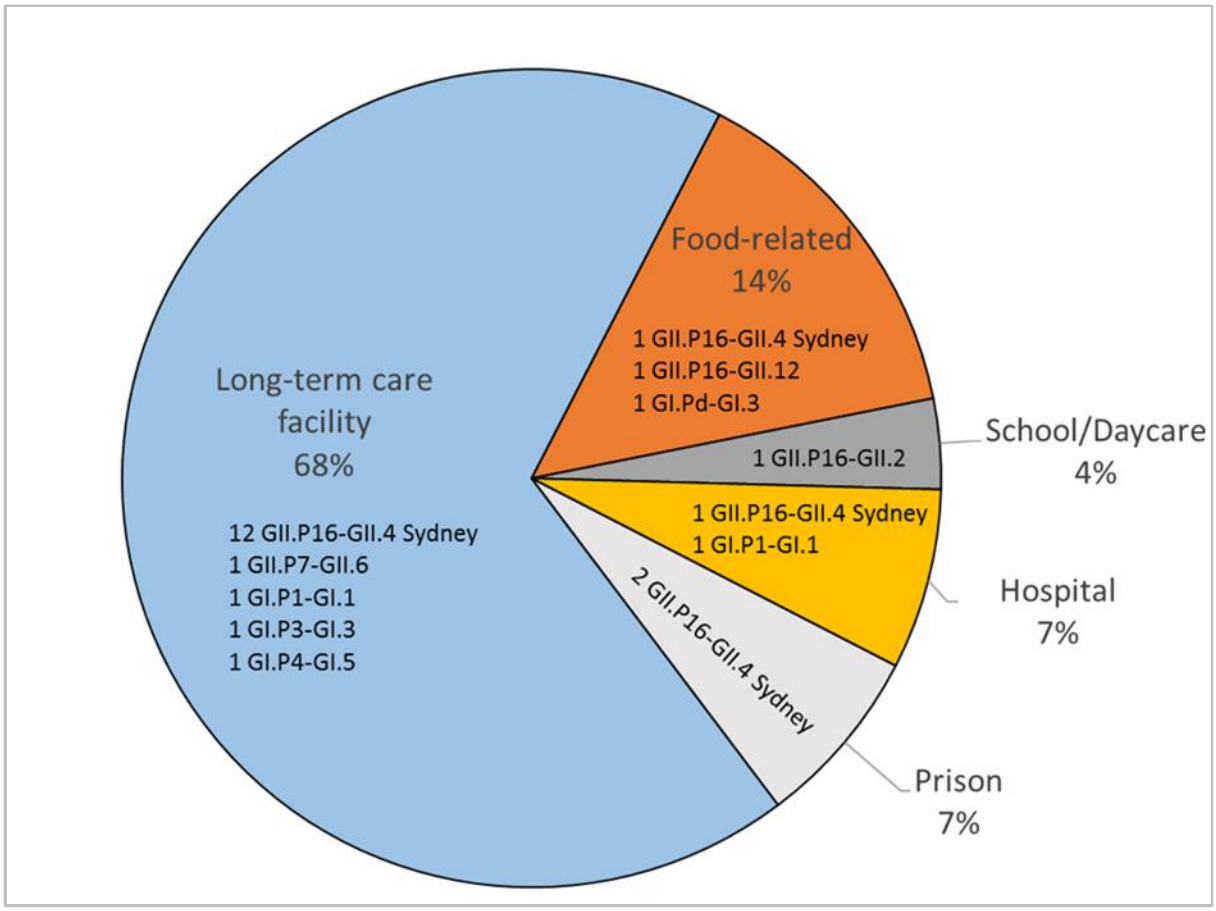


Figure 3: Number of Laboratory-Confirmed Norovirus Outbreaks Reported by the NLN - Comparison Between 2017-18 and 2018-19 Seasonal Incidence by Month, February through May

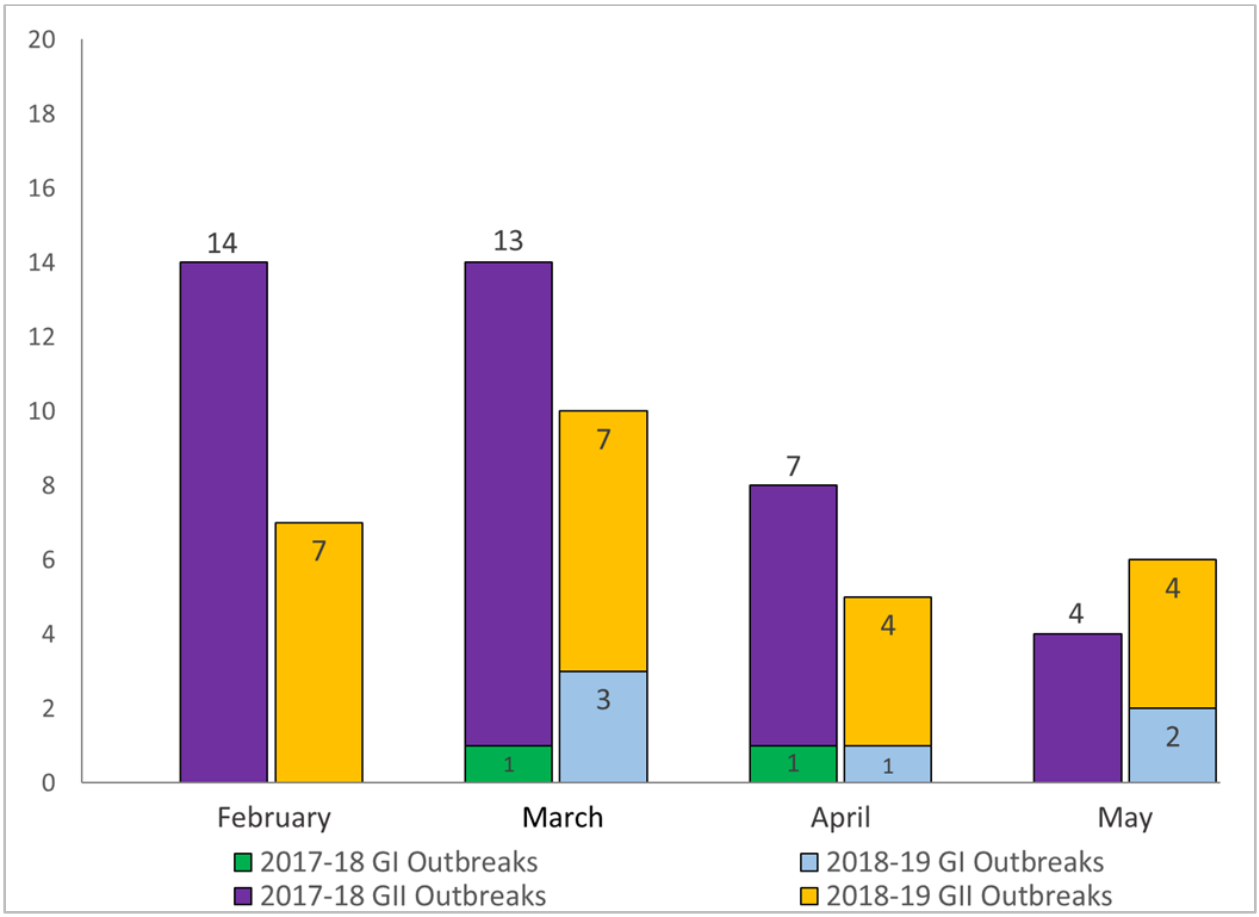
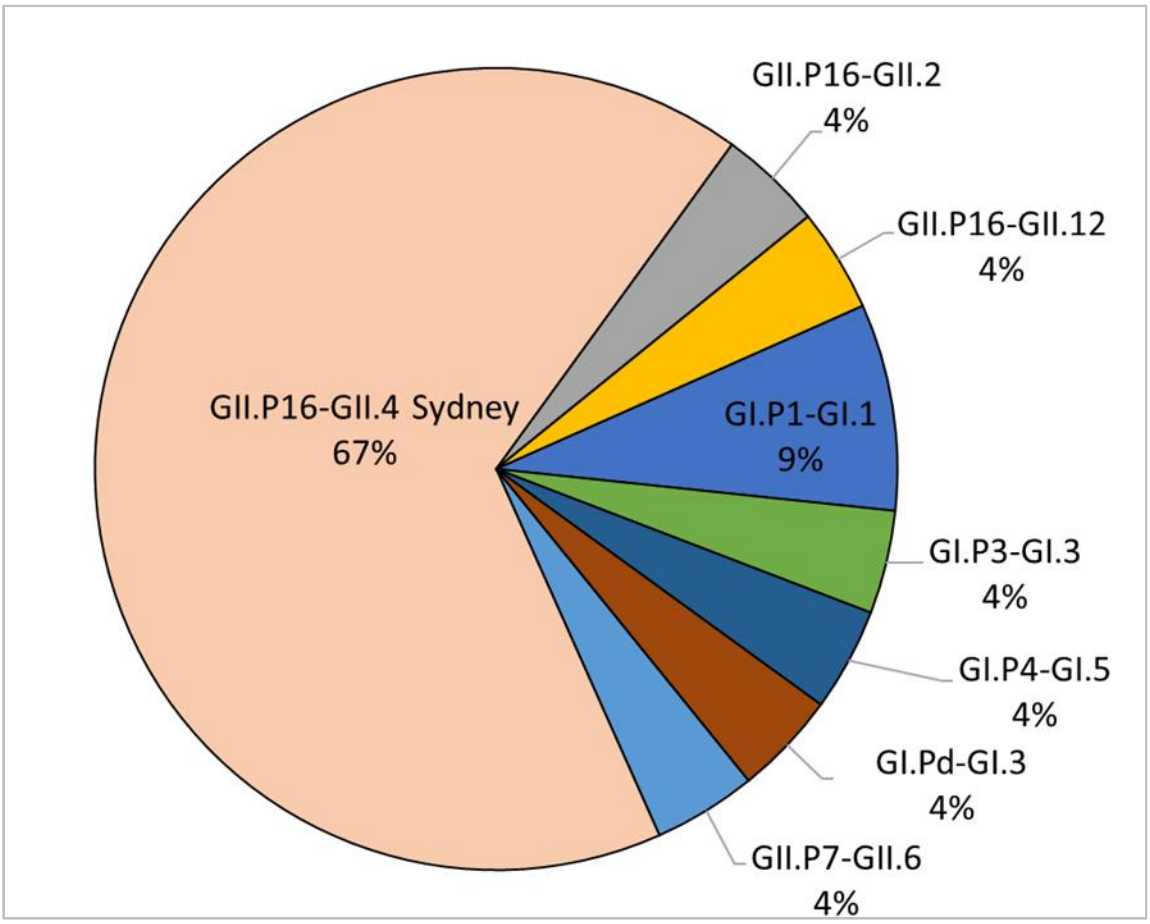


Figure 4: Norovirus Genotypes Identified* from Reported Norovirus Outbreaks, February – May 2019 (N = 24)



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

REMINDERS

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. 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. 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. VRDL can provide, upon request, real-time RT-PCR primers and probe and controls for norovirus PCR. Please contact Chao Pan (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).

The next California NLN Triannual Report (June-September 2019) will be published in December 2019.