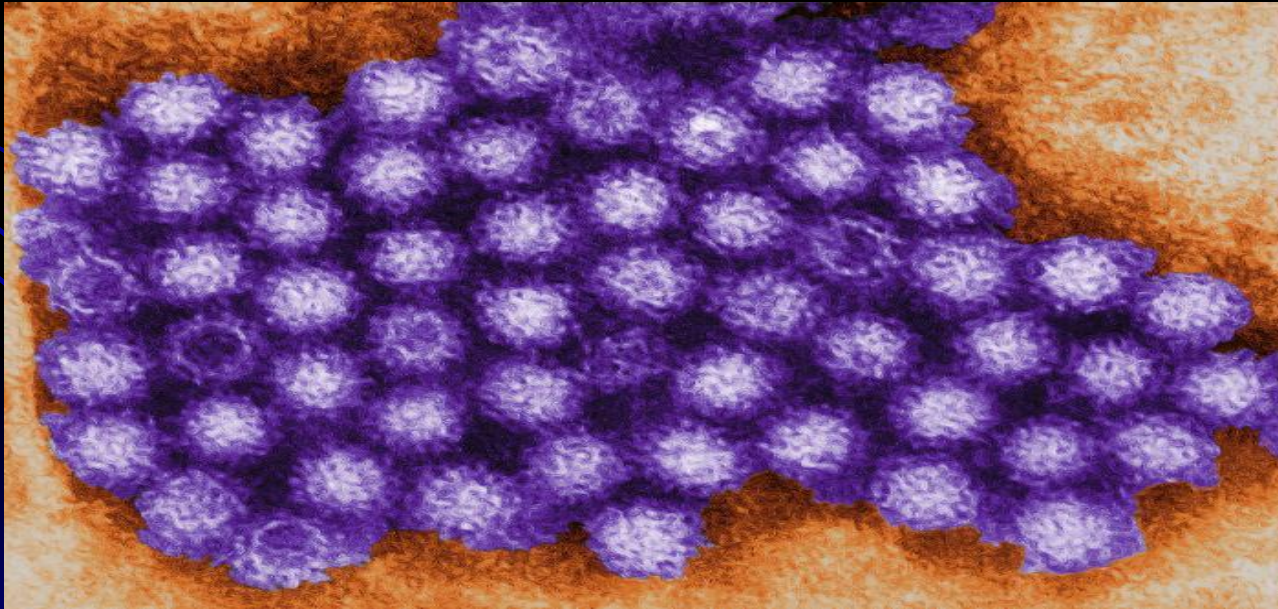


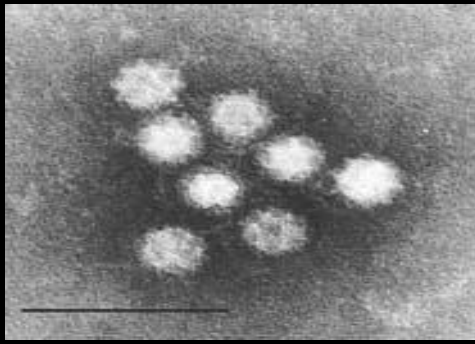
Norovirus and Norovirus-Like Illness (NLI) in Michigan

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Surveillance and Infectious Disease Epidemiology Section





Norovirus

- **Incubation: 12 - 48 hours (median 33-36 hours)**
- **Duration: 12 - 60 hours**
- **Symptoms: diarrhea, vomiting, nausea, abdominal cramping, low grade fever**
- **Survival on surfaces:**
 - **40 F, > 60 days**
 - **68 F (room temp), 21-28 days**
 - **98.6 F, less than 1 day**

Required Outbreak Reporting: Public Health

- **R 325.173** Details the reporting requirements for health care providers, health care facilities, and clinical laboratories
- **R 325.174** Gives local and state public health officials the authority to investigate possible cases of illness
- **www.michigan.gov/orr**

Disease Reporting

- “...report any unusual occurrence, outbreak, or epidemic of any disease or condition including healthcare-associated infections.”
- Report within 24 hours of outbreak detection
- Report to LHD or MDCH
- Any information pertinent to the outbreak should be reported
 - E.g., Number ill, onset, incubation, duration, organism, control measures

REPORTABLE DISEASES IN MICHIGAN - 2011

A Guide for Physicians, Health Care Providers and Laboratories

Report the following conditions to the Michigan Disease Surveillance System (MDSS) or local health department (see reverse) within 24 hours (unless otherwise noted) if the agent is identified by clinical diagnosis, direct examination, culture, serology, molecular techniques or histopathology.

**Acquired Immunodeficiency Syndrome (AIDS)	Leptospira species
Anaplasma phagocytophilum (Anaplasmosis)	Listeria monocytogenes
Arboviral encephalitides, neuro- and non-neuroinvasive	Measles virus (Measles/Rubeola)
California serogroup, Eastern Equine, Powassan	Meningitis, bacterial and viral
St. Louis, Western Equine, West Nile	Mumps virus
Babesia microti (Babesiosis)	† Mycobacterium tuberculosis complex (Tuberculosis)
Bacillus anthracis (Anthrax)	Neisseria gonorrhoeae (Gonorrhoea)
Blastomyces dermatitidis (Blastomycosis)	Neisseria meningitidis, sterile sites (Meningococcal Disease)
Bordetella pertussis (Pertussis)	Orthopox viruses (including: Smallpox, Monkeypox)
Borrelia burgdorferi (Lyme Disease)	Plasmodium species (Malaria)
Brucella species	Poliovirus
Burkholderia mallei (Glanders)	Prion disease (Including: CJD)
Burkholderia pseudomallei (Meliodiosis)	Rabies virus
Campylobacter species	*Rheumatic fever
Chlamydia trachomatis (Trachoma, Genital infections, LGV)	Rickettsia species (Spotted Fever and Typhus Group)
Chlamydia pneumoniae (Psittacosis)	Rubella virus
Clostridium botulinum (Botulism)	Salmonella species
Clostridium tetani (Tetanus)	Salmonella typhi (Typhoid Fever)
Coccidioides immitis (Coccidioidomycosis)	Severe Acute Respiratory Syndrome (SARS)
Corynebacterium diphtheriae (Diphtheria)	Shigella species
Coxiella burnetii (Q Fever)	Staphylococcus aureus, (MRSA), outbreaks only
Cryptosporidium species	Staphylococcus aureus, vancomycin intermediate/ resistant (VISA/VRSA)
Cyclospora species	Streptococcus pneumoniae, sterile sites
Dengue virus	Streptococcus pyogenes, group A, sterile sites
Ehrlichia species	*Toxic Shock Syndrome
Encephalitis, viral or unspecified	Treponema pallidum (Syphilis)
Entamoeba histolytica (Amebiasis)	Trichinella spiralis (Trichinellosis)
† Escherichia coli, O157:H7 and all other shiga toxin positive serotypes	Varicella (Chickenpox)
Francisella tularensis (Tularemia)	Vibrio species (Cholera)
Giardia species	Vibrio cholera, V. parahaemolyticus, or V. vulnificus
*Guillain-Barre Syndrome	Viral Hemorrhagic Fever
Haemophilus ducreyi (Chancroid)	Yellow fever virus
Haemophilus influenzae, sterile sites only; submit isolates for serotyping for patients <15 years of age	Yersinia enterocolitica (Yersiniosis)
Hantavirus	Yersinia pestis (Plague)
Hemolytic Uremic Syndrome (HUS)	
Hepatitis, viral	
Hepatitis A virus, (Anti-HAV IgM)	
Hepatitis B virus, (HBsAg), especially in pregnant women	
Hepatitis C virus, (Anti-HCV, RNA, RIBA, genotype)	
Hepatitis D virus, (HDsAg, anti-HDV IgM)	
Hepatitis E virus, (Anti-HEV IgM)	
Histoplasma capsulatum (Histoplasmosis)	
**HIV, (Confirmed positive HIV diagnostic serology and detection tests; CD4 counts/percents and all viral loads on people already known to be infected)	
Influenza virus (Weekly aggregate counts)	
Pediatric mortality, report individual cases	
Novel Influenza viruses, report individual cases	
*Kawasaki Disease	
Legionella species	

Note: Also report the unusual occurrence, outbreak or epidemic of any disease or condition including healthcare-associated infections.

LEGEND

- Blue Bold Text** = An isolate, diagnostic specimen, or serum sample, where appropriate, must be submitted to MDCH or other laboratory designated by MDCH.
- † An isolate, if available, or the non-culture positive broth and/or stool specimen must be submitted to MDCH laboratory
- ‡ All preliminary tuberculosis test results are to be reported to appropriate local health department and isolates submitted to MDCH laboratory.
- * Reporting within 3 days is required.
- ** Reporting within 7 days is required.

This reporting is expressly allowed under HIPAA and required by Michigan Public Act 368 Communicable Disease Rules: R 325.171-3, 333.5111

Disinfection

- Use dilute bleach (inexpensive and effective)
- Alternatives:
 - EPA-registered disinfectants
 - Accelerated Hydrogen Peroxide
 - Glutaraldehyde (0.5%)
 - Iodine (0.8%)
 - Lysol® or Pinesol® (2 - 4x manufacturer's recommended concentration)

Disinfection Concentrations

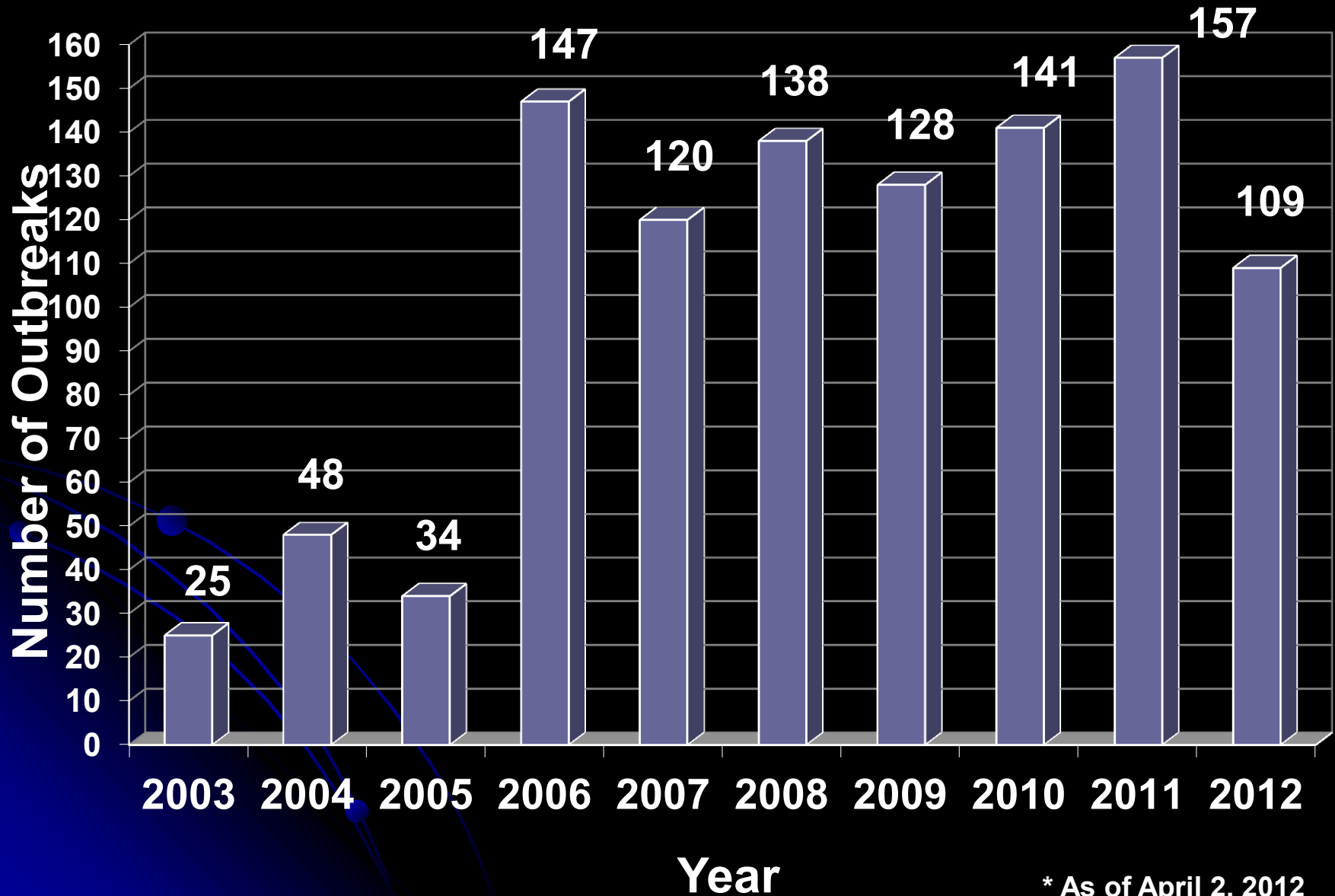
- **Stainless steel, food/mouth items, toys**
 - 200ppm
 - 1 tablespoon of bleach to 1 gallon of water
- **Non-porous surfaces, tile floors, counter-tops, sinks, toilets**
 - 1000ppm
 - 1/3 cup bleach to 1 gallon of water
- **Porous surfaces, wooden floors**
 - 5000ppm
 - 1 and 1/2 cup bleach to 1 gallon water

Norovirus-Like Illness (NLI) Outbreak Definition

Gastrointestinal illness (GI) clusters are defined as NLI outbreaks when:

- **Cases present with signs and symptoms consistent with norovirus infection**
- **Are not laboratory confirmed as norovirus**
- **For facilities (e.g., hospitals, schools, daycares, prisons), GI activity is above normal baseline**

NLI Outbreaks per Year, Michigan 2003 – 2012*



* As of April 2, 2012

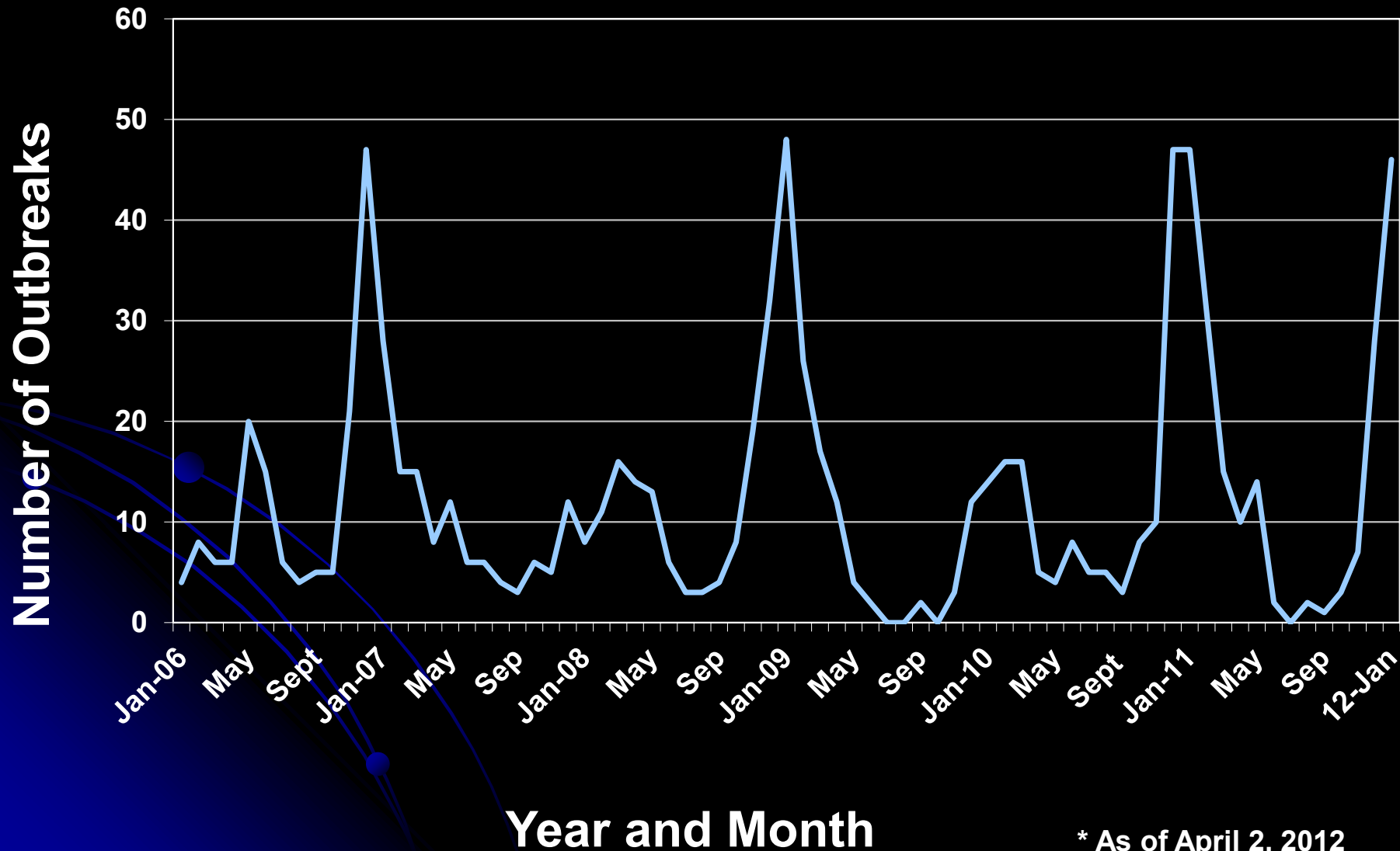
NLI Outbreaks and Case Counts¹, Michigan 2006 – 2012*

Year	Total Outbreaks	Cases
2007	120	3,650
2008	138	3,437
2009	128	3,253
2010	141	3,525
2011	158	4,354
2012*	109	3,647

¹ Case counts based on initial report

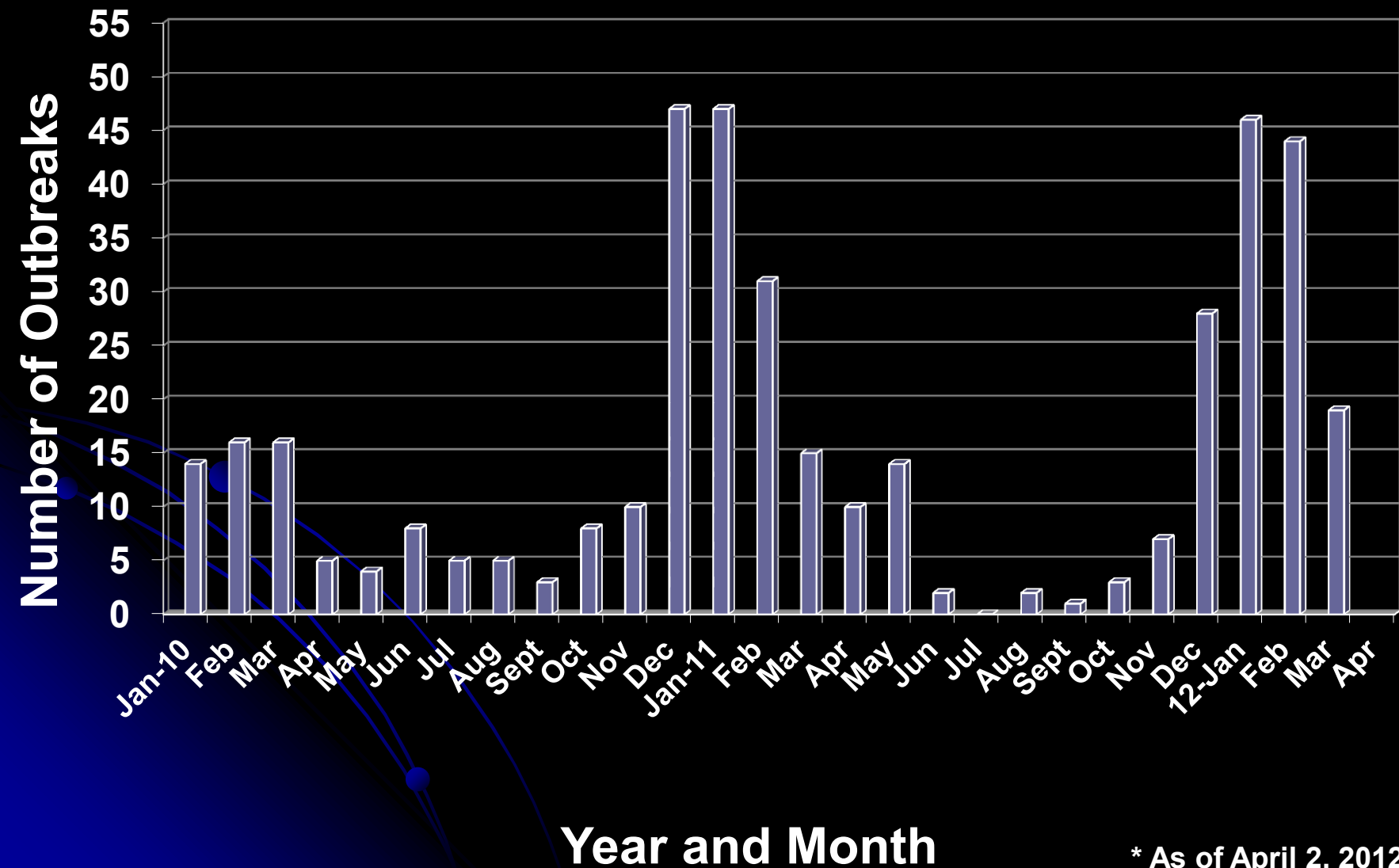
* As of April 2, 2012

NLI Outbreaks per Month, Michigan Jan 2006 – Apr 2012*



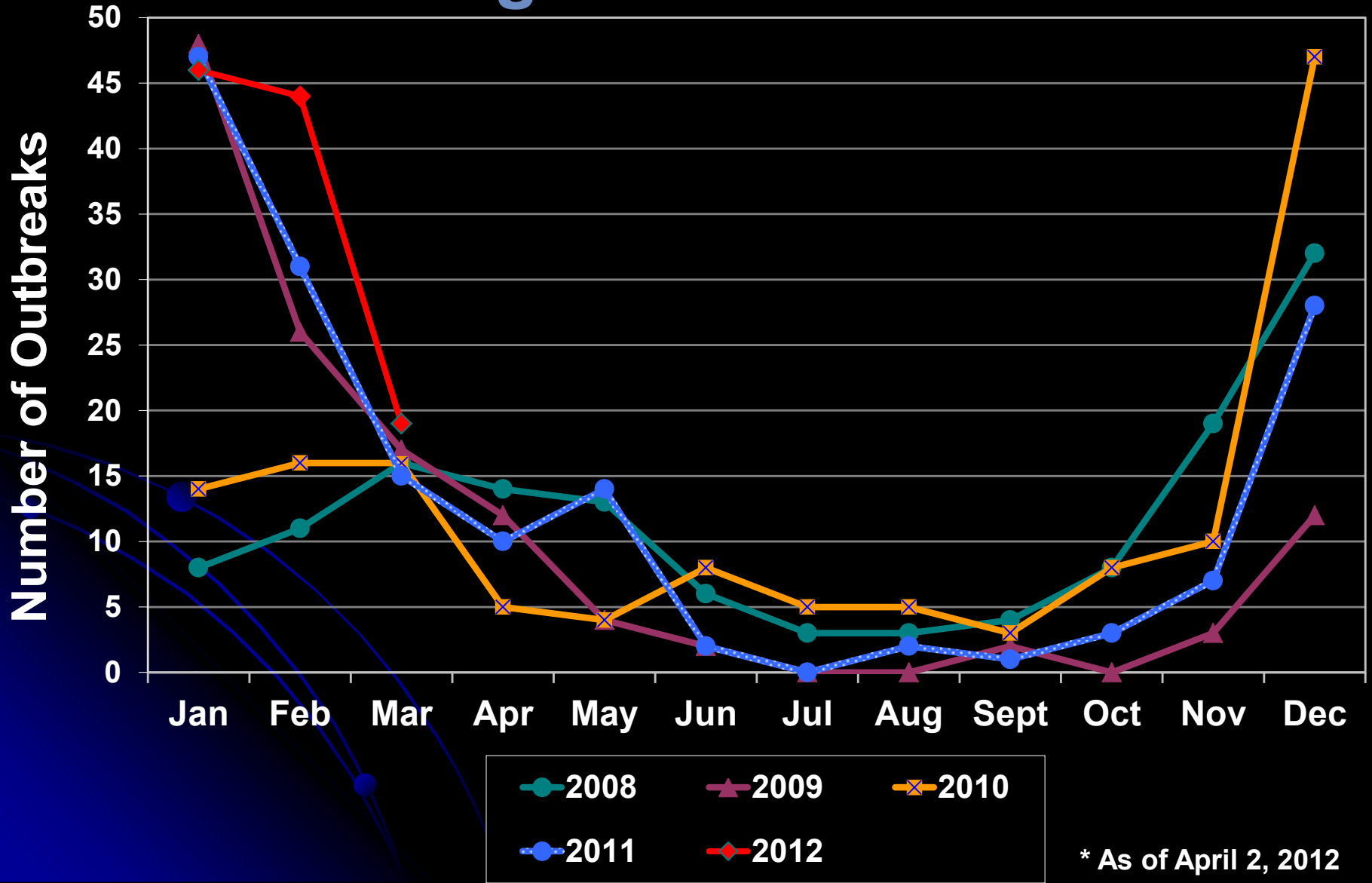
* As of April 2, 2012

NLI Outbreaks per Month, Michigan Jan 2010 – Apr 2012*

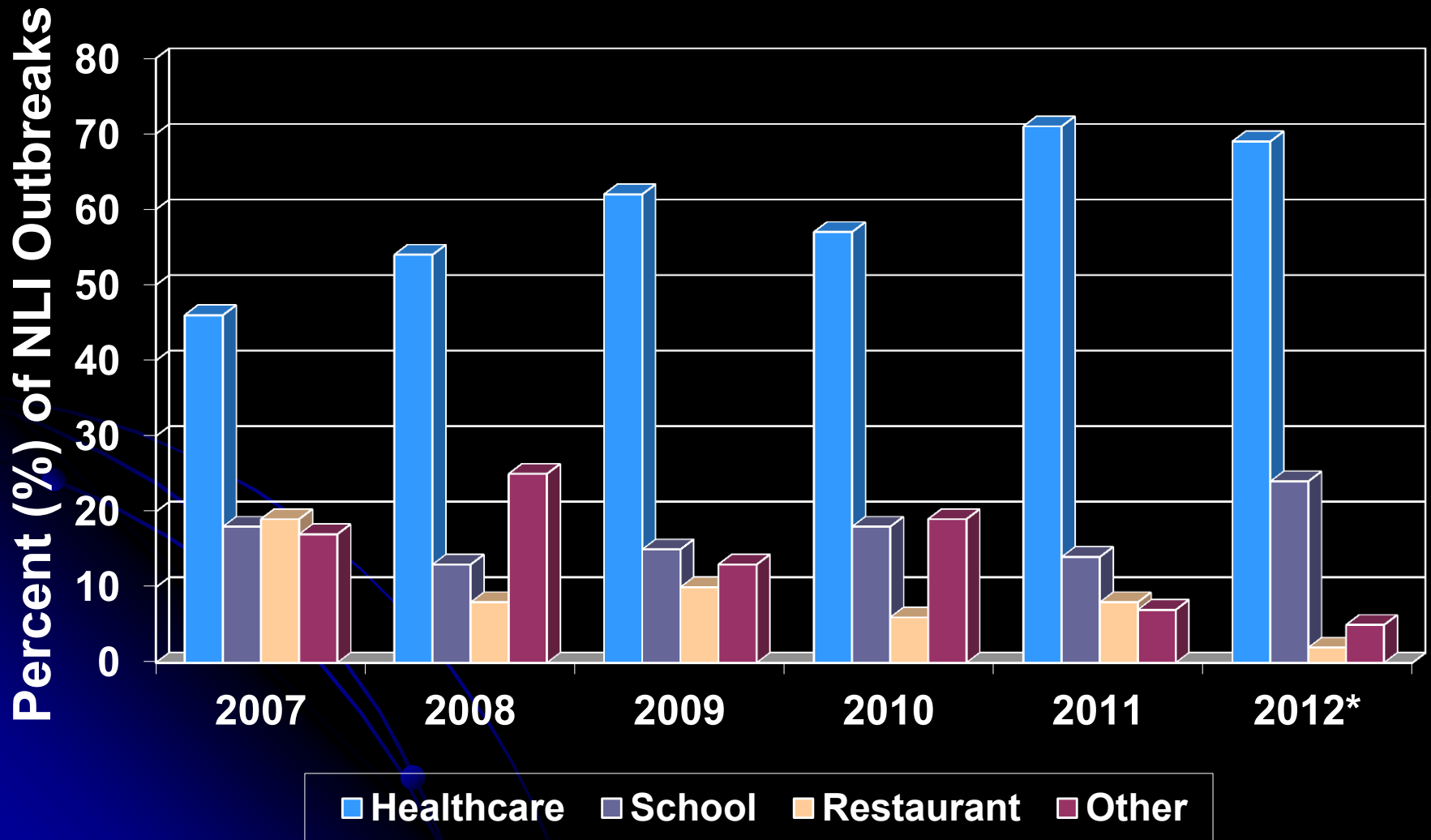


* As of April 2, 2012

NLI Outbreaks per Month, Michigan 2006 – 2012*

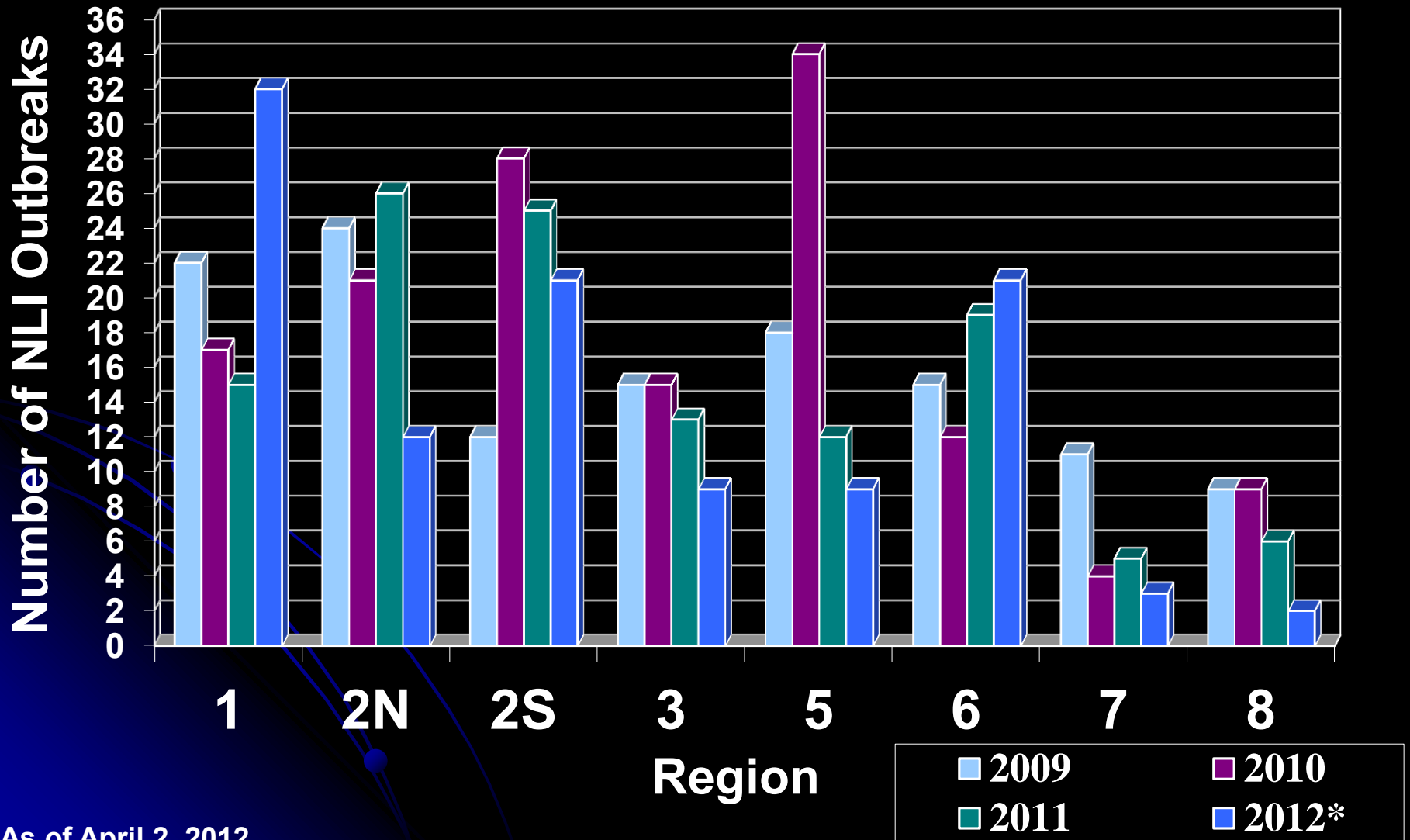


Percentage of NLI Associated Settings, Michigan 2007 – 2012*



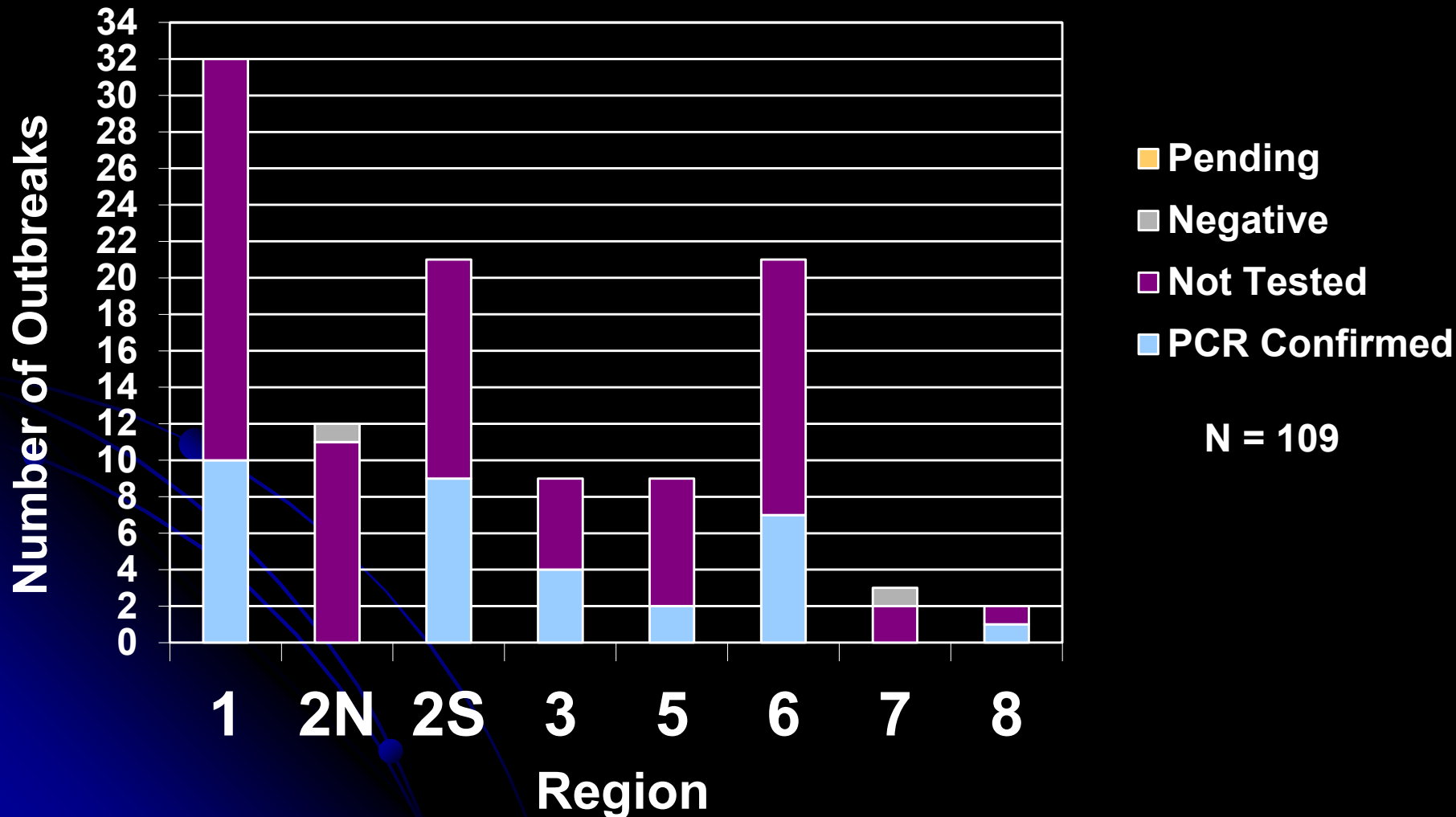
* As of April 2, 2012

NLI Outbreaks by Region, Michigan 2009 - 2012*



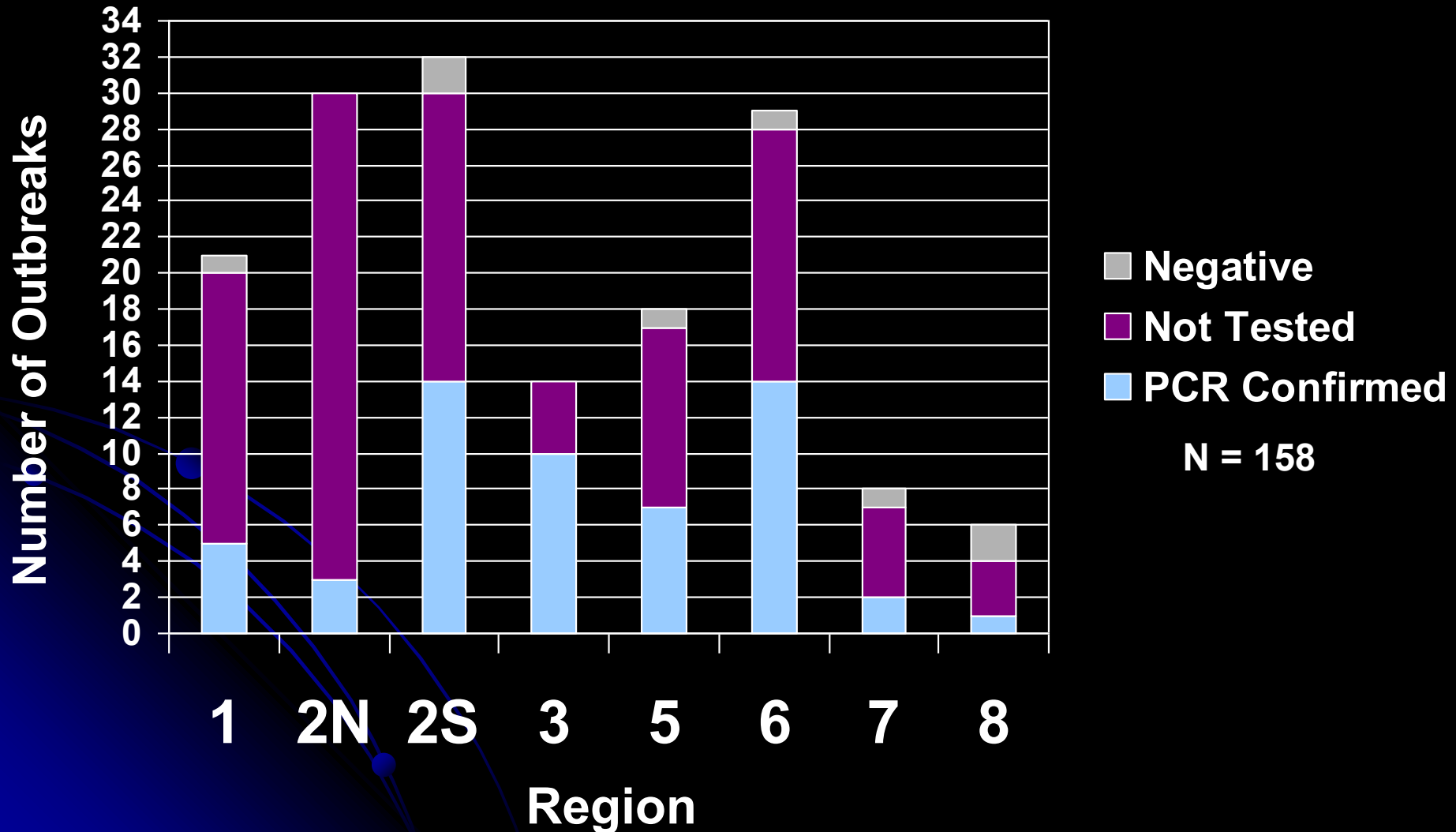
* As of April 2, 2012

Norovirus Outbreak Testing Status by Region, Michigan 2012*

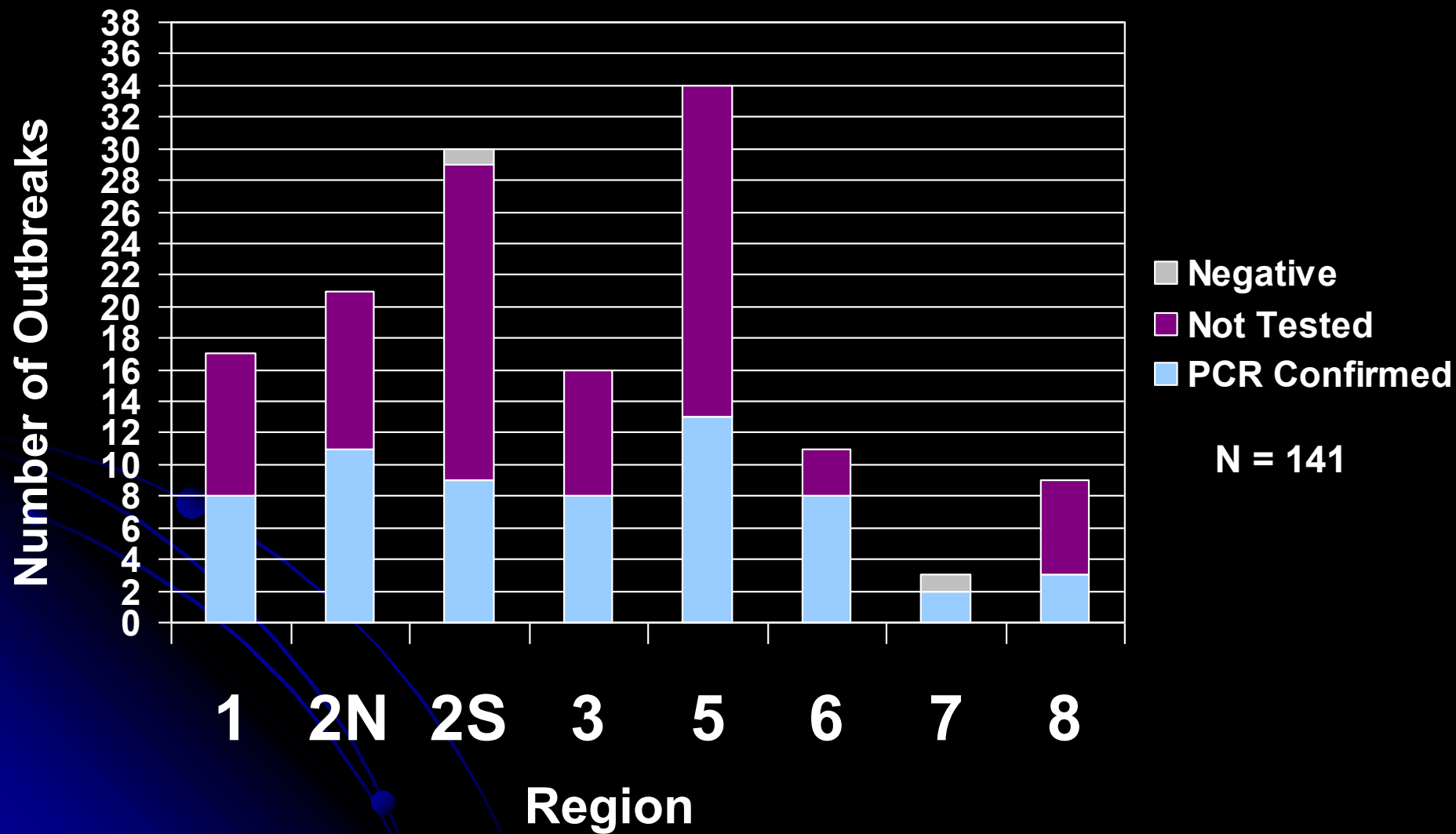


* As of April 2, 2012

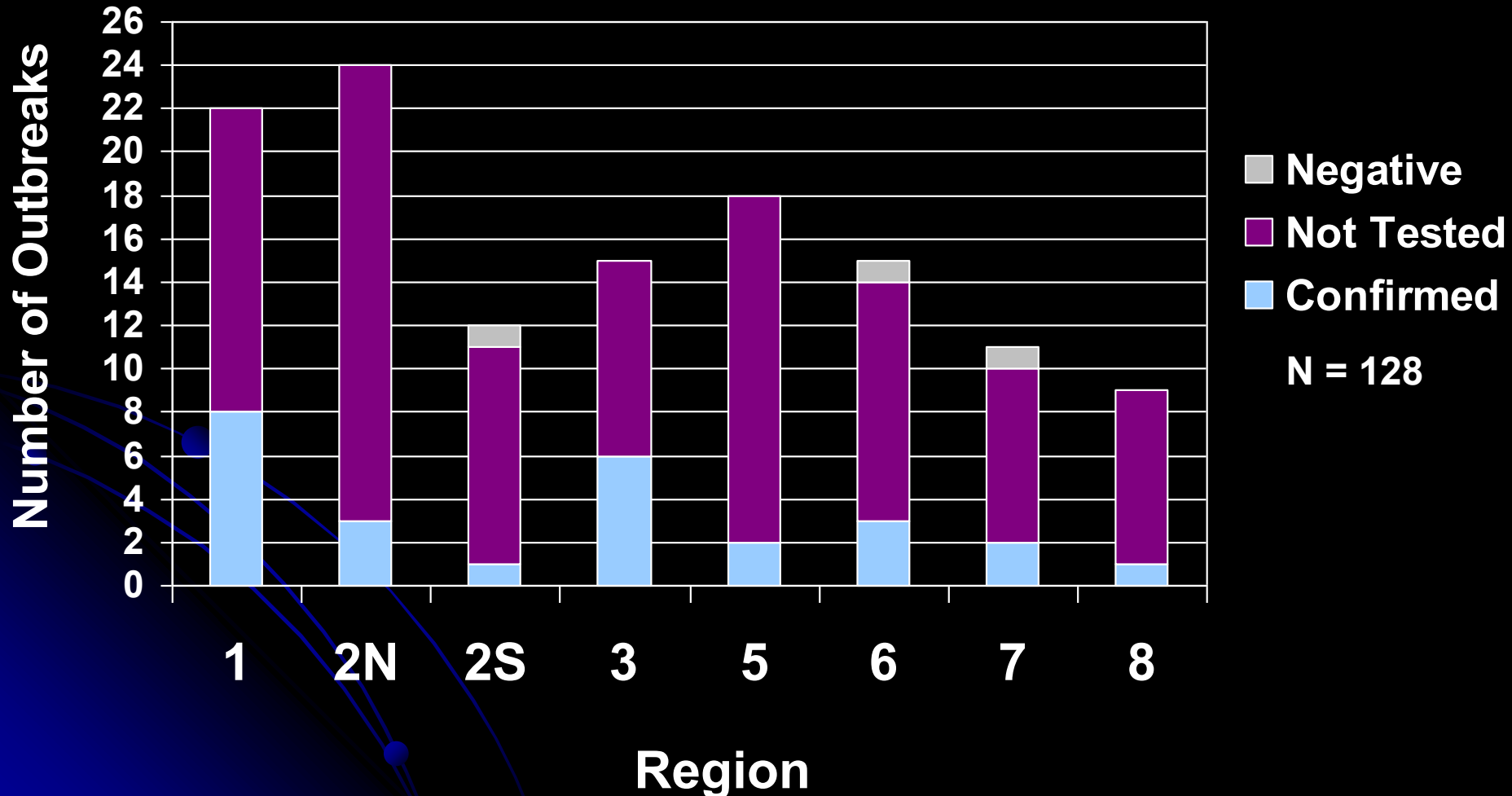
Norovirus Outbreak Testing Status by Region, Michigan 2011



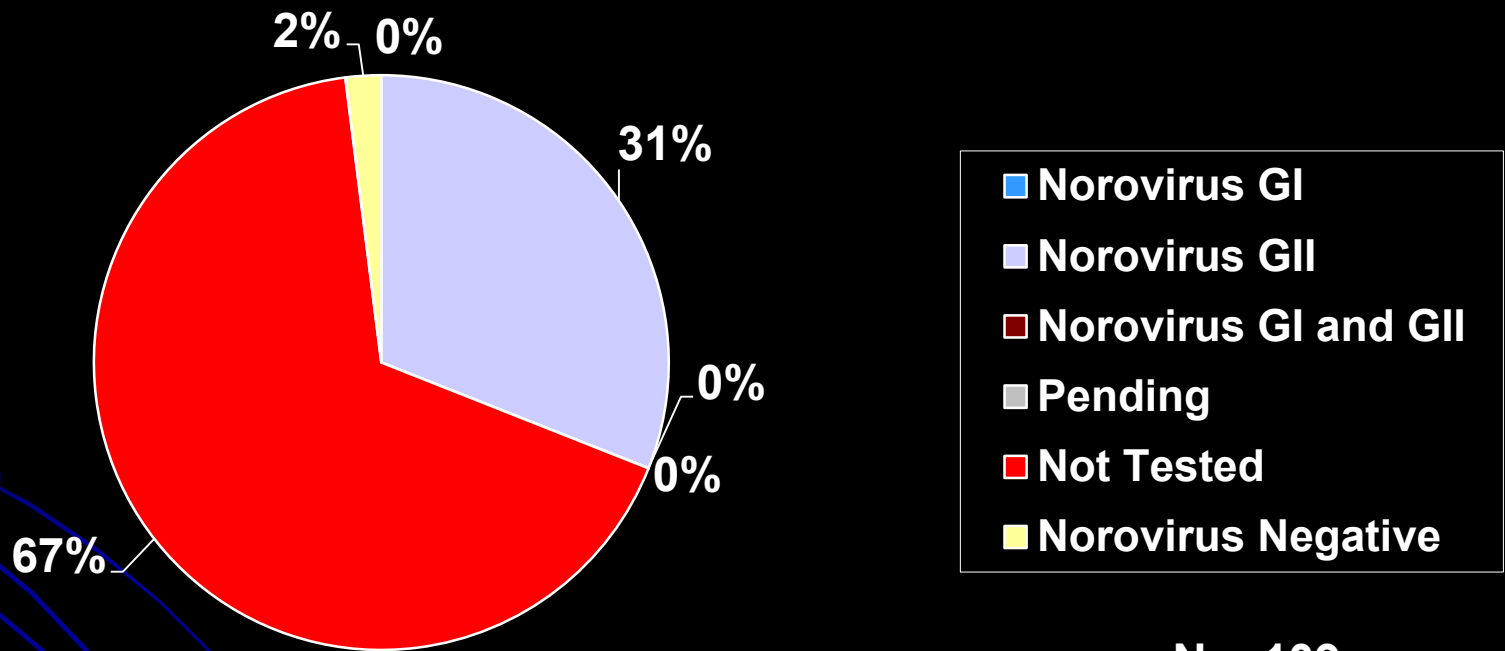
Norovirus Outbreak Testing Status by Region, Michigan 2010



Norovirus Outbreak Testing Status by Region, Michigan 2009



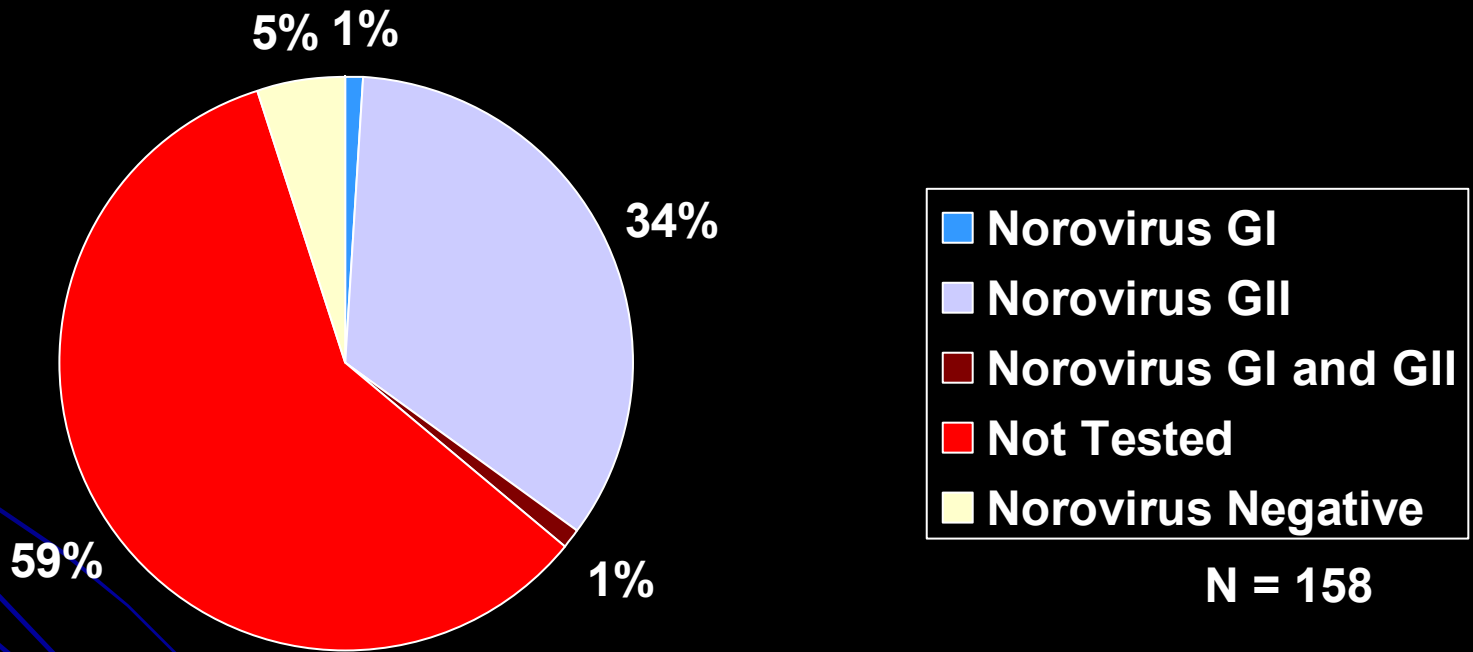
Percentage of PCR Confirmed Norovirus Outbreaks, Michigan 2012*



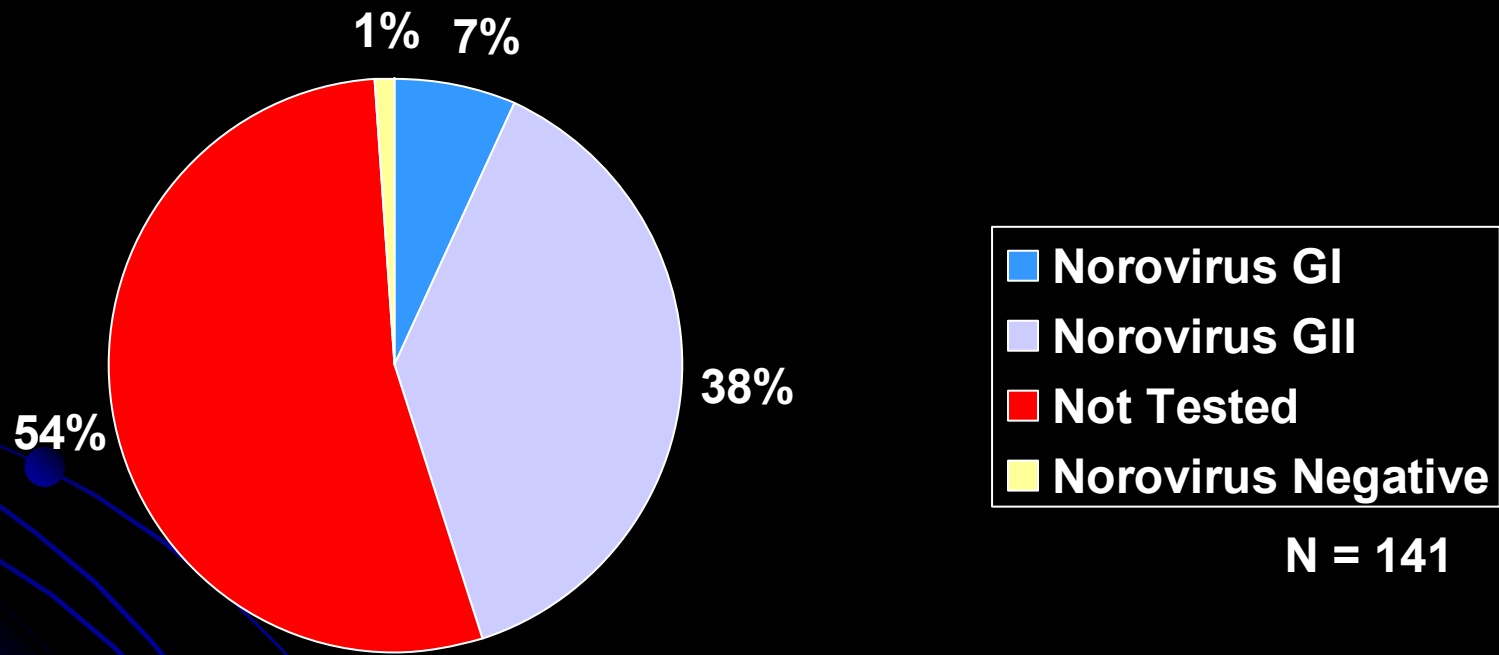
N = 109

* As of April 2, 2012

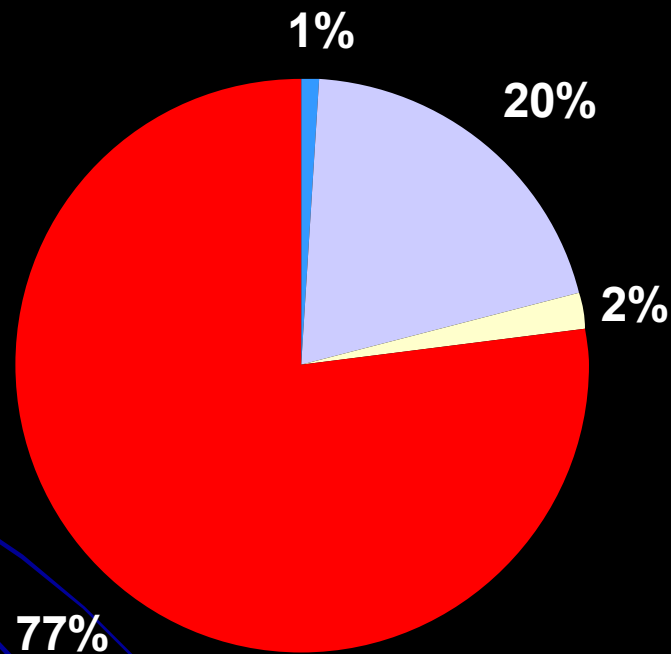
Percentage of PCR Confirmed Norovirus Outbreaks, Michigan 2011



Percentage of PCR Confirmed Norovirus Outbreaks, Michigan 2010



Percentage of PCR Confirmed Norovirus Outbreaks, Michigan 2009



N = 128

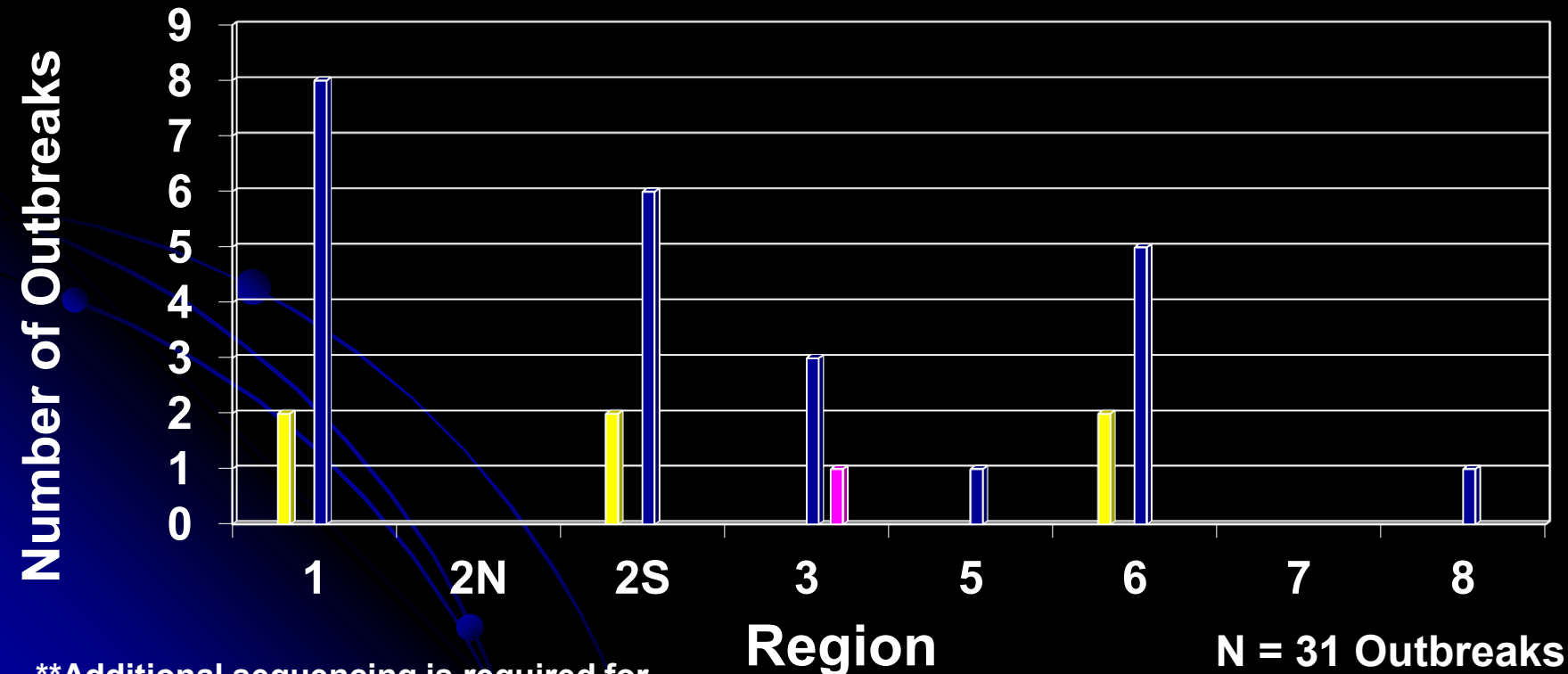
NLI Outbreak Laboratory Results, Michigan 2009 -2012*

Result:	2009 Count	2010 Count	2011 Count	2012 Count
Norovirus GI and GII	1	0	1	0
Norovirus GI	0	10	2	0
Norovirus GII	25	53	53	34
Norovirus GII Antigen¹	0	4	6	0
Norovirus Negative	3	2	8	2
Pending	0	0	0	0
Not Tested	99	76	94	73
Total	128	141	158	109

¹ The CDC does not recognize norovirus antigen testing performed by private laboratories. Therefore, these outbreaks are not confirmed and are considered “not tested” unless samples are forwarded to MDCH.

* As of April 2, 2012

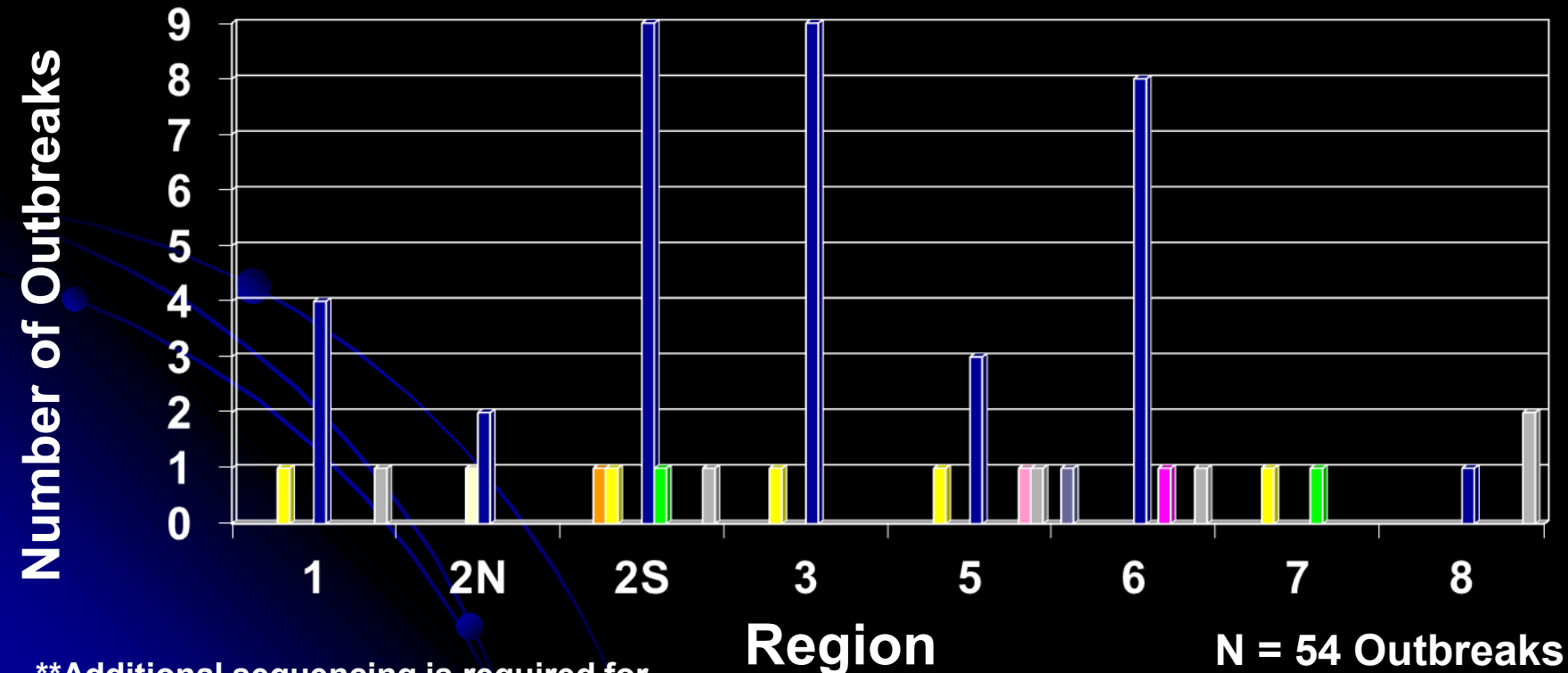
Norovirus PCR Sequencing Results per Region, Michigan 2012*



**Additional sequencing is required for samples sent to the CDC.

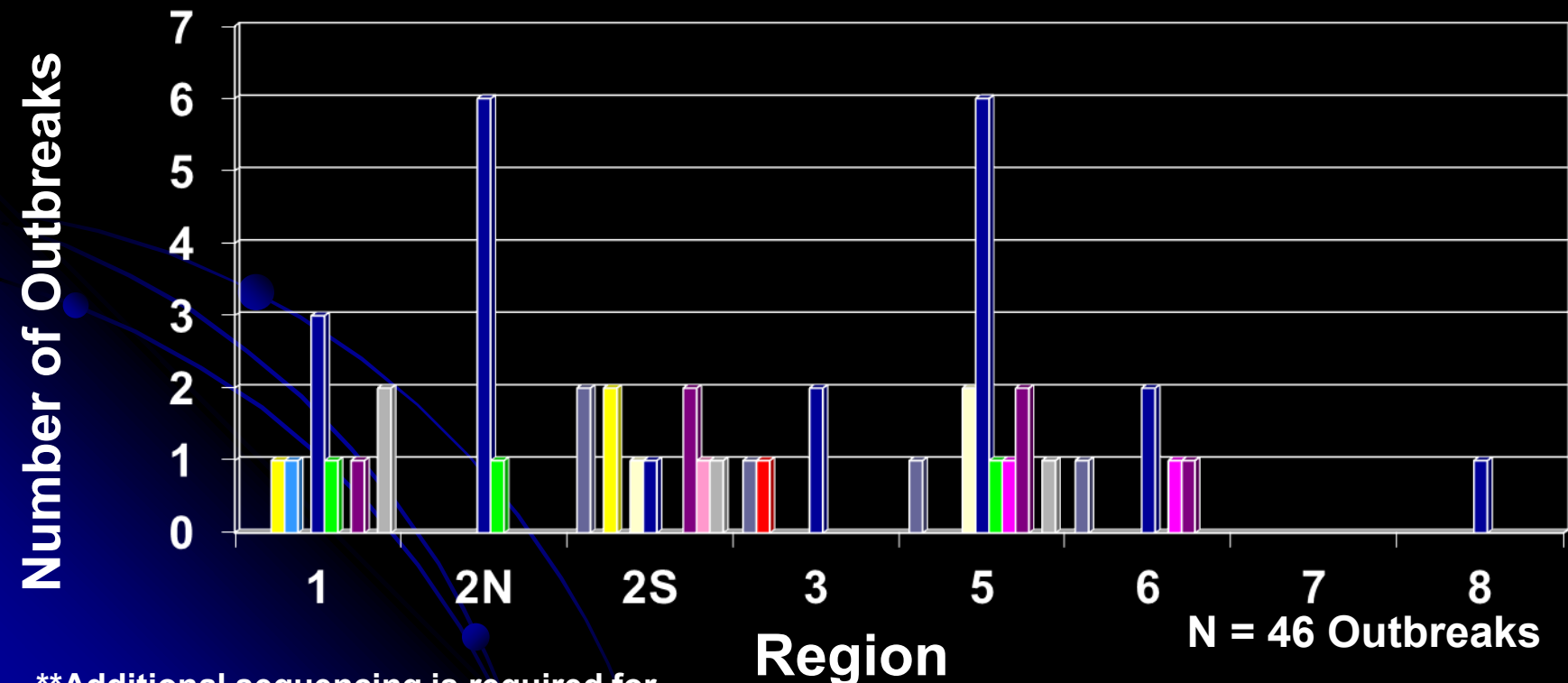
* As of April 2, 2012

Norovirus PCR Sequencing Results per Region, Michigan 2011



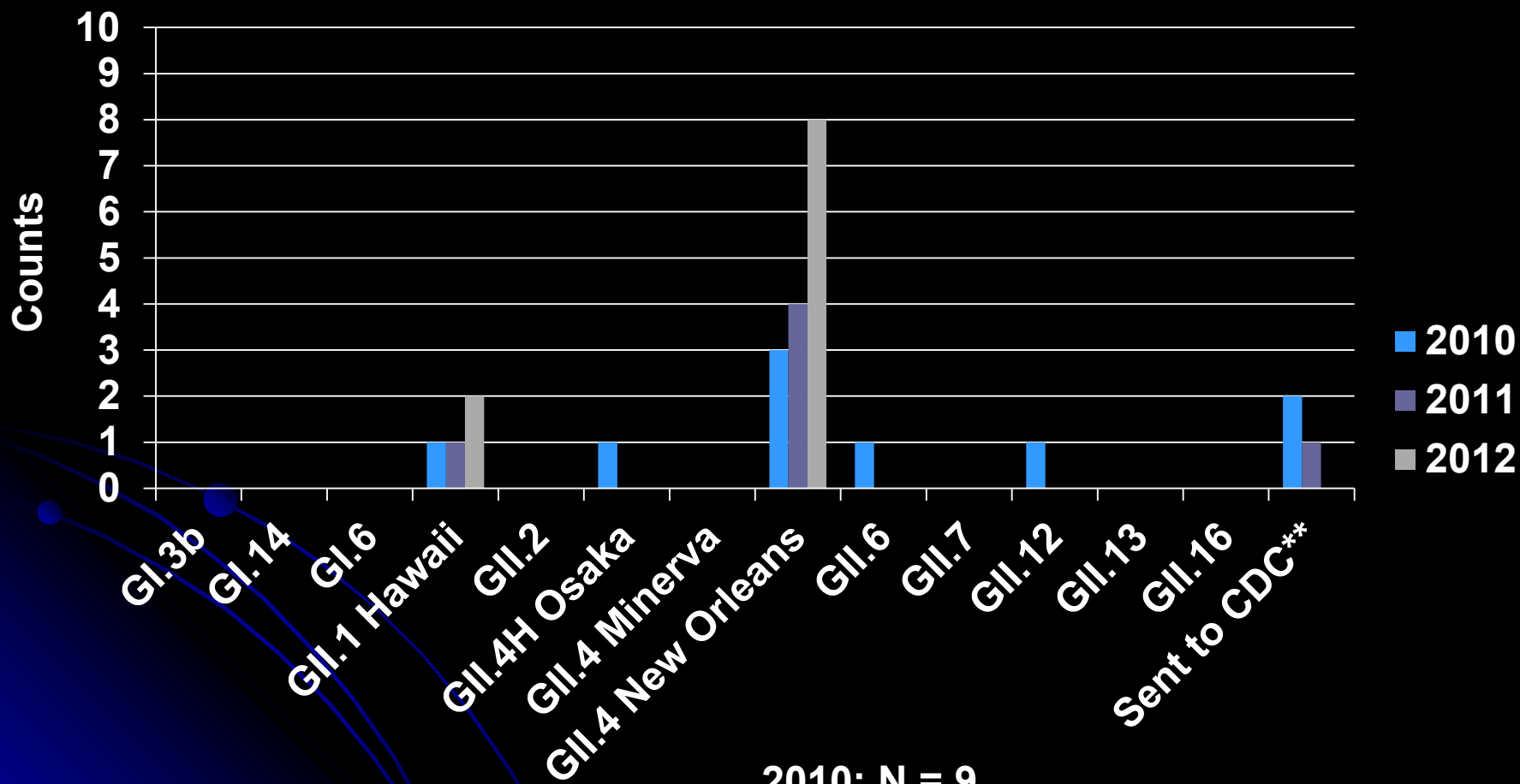
**Additional sequencing is required for samples sent to the CDC.

Norovirus PCR Sequencing Results per Region, Michigan 2010



**Additional sequencing is required for samples sent to the CDC.

Region 1: Norovirus PCR Sequencing Results, Michigan 2010-2012*

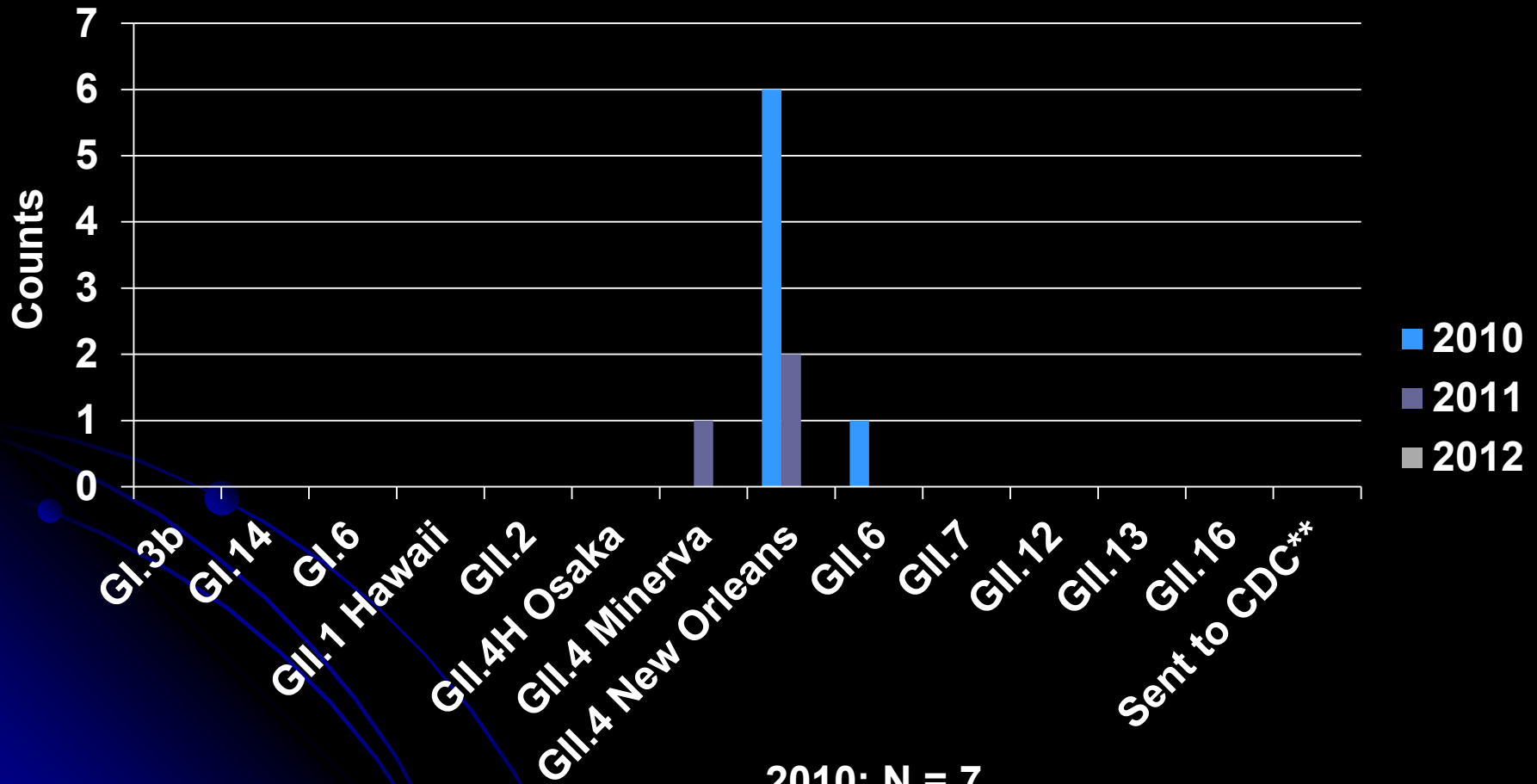


2010: N = 9
 2011: N = 5
 2012: N = 10

**Additional sequencing is required for samples sent to the CDC.

* As of April 2, 2012

Region 2N: Norovirus PCR Sequencing Results, Michigan 2010-2012*

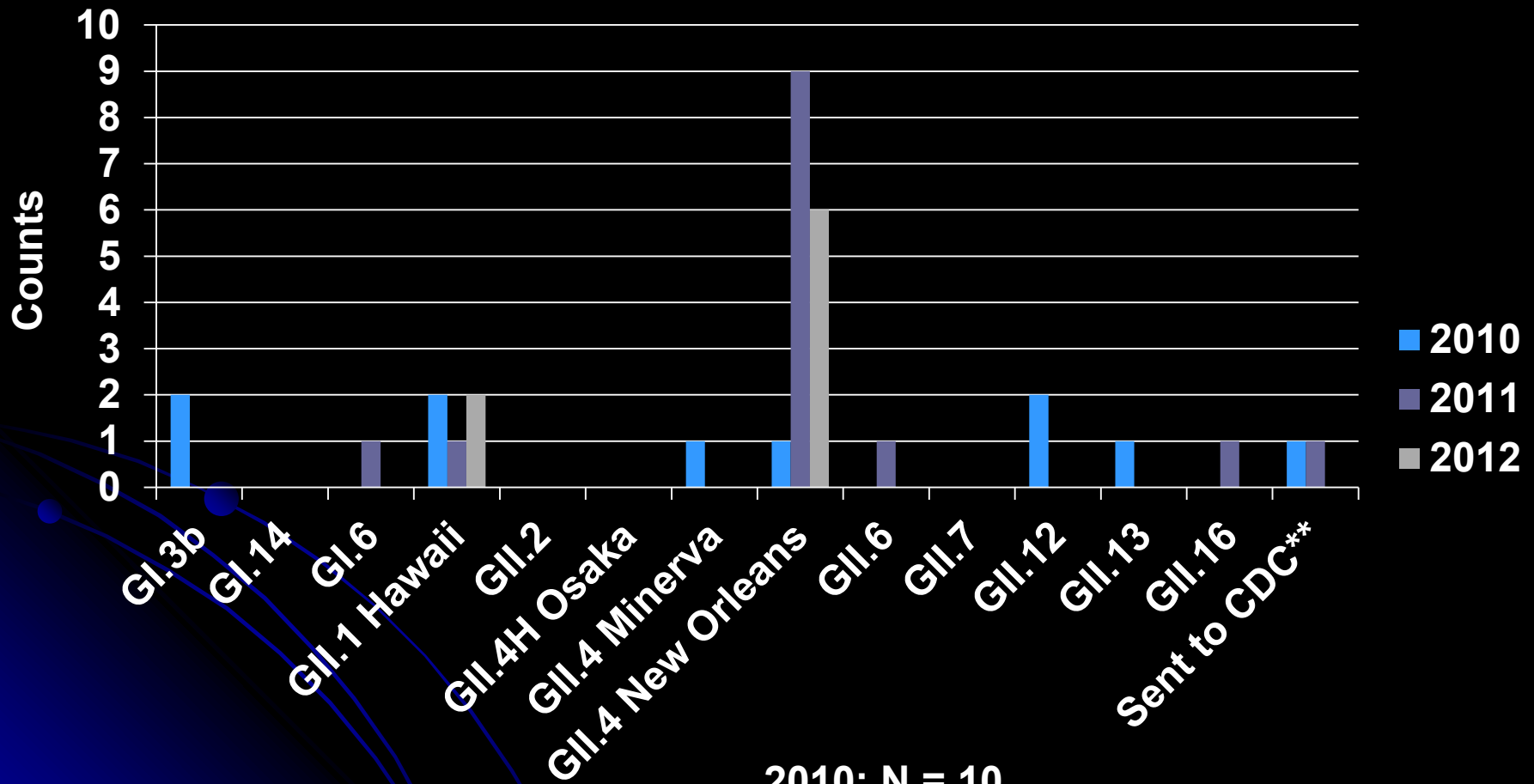


2010: N = 7
 2011: N = 3
 2012: N = 0

**Additional sequencing is required for samples sent to the CDC.

* As of April 2, 2012

Region 2S: Norovirus PCR Sequencing Results, Michigan 2010-2012*



2010: N = 10

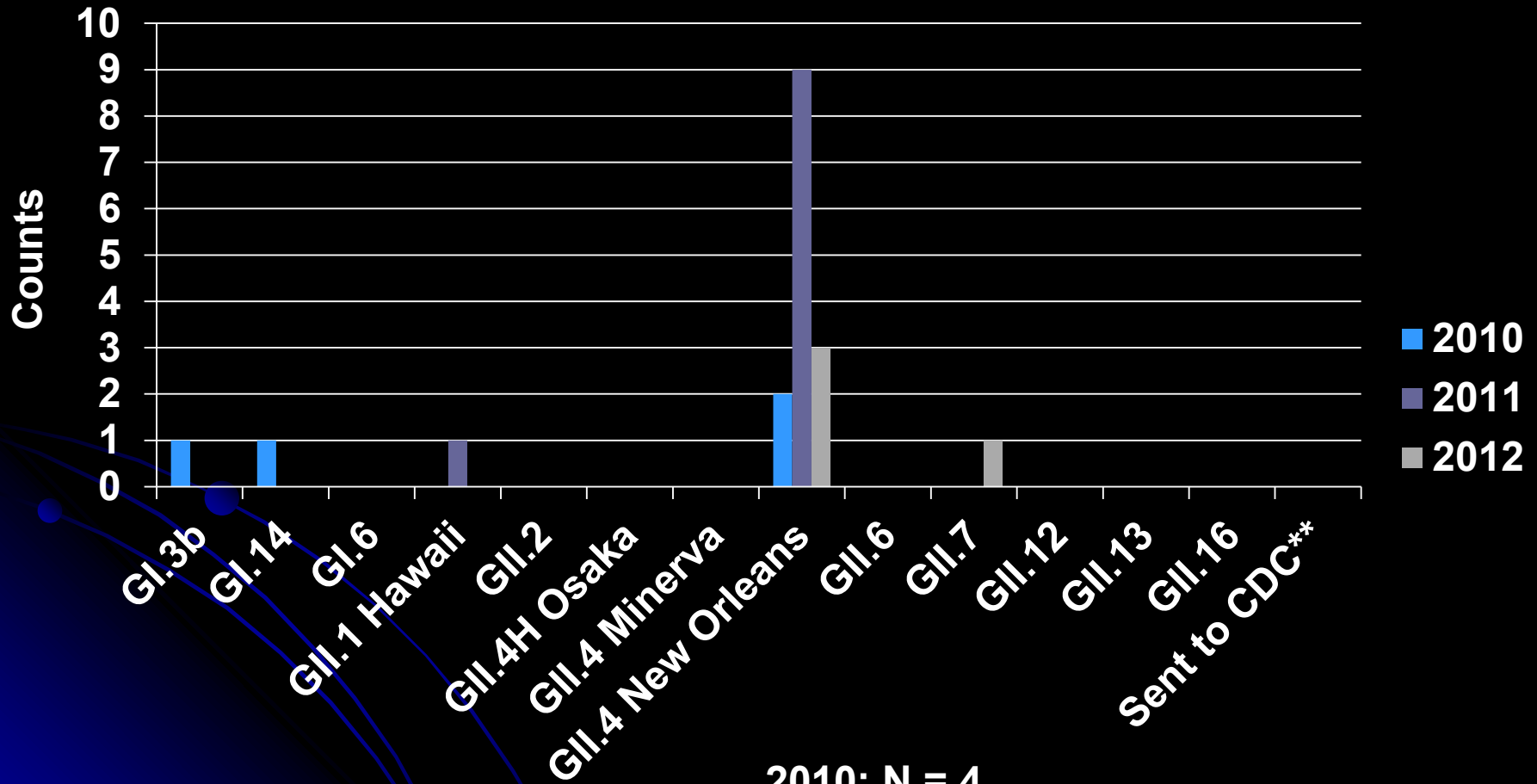
2011: N = 14

2012: N = 8

**Additional sequencing is required for samples sent to the CDC.

* As of April 2, 2012

Region 3: Norovirus PCR Sequencing Results, Michigan 2010-2012*



2010: N = 4

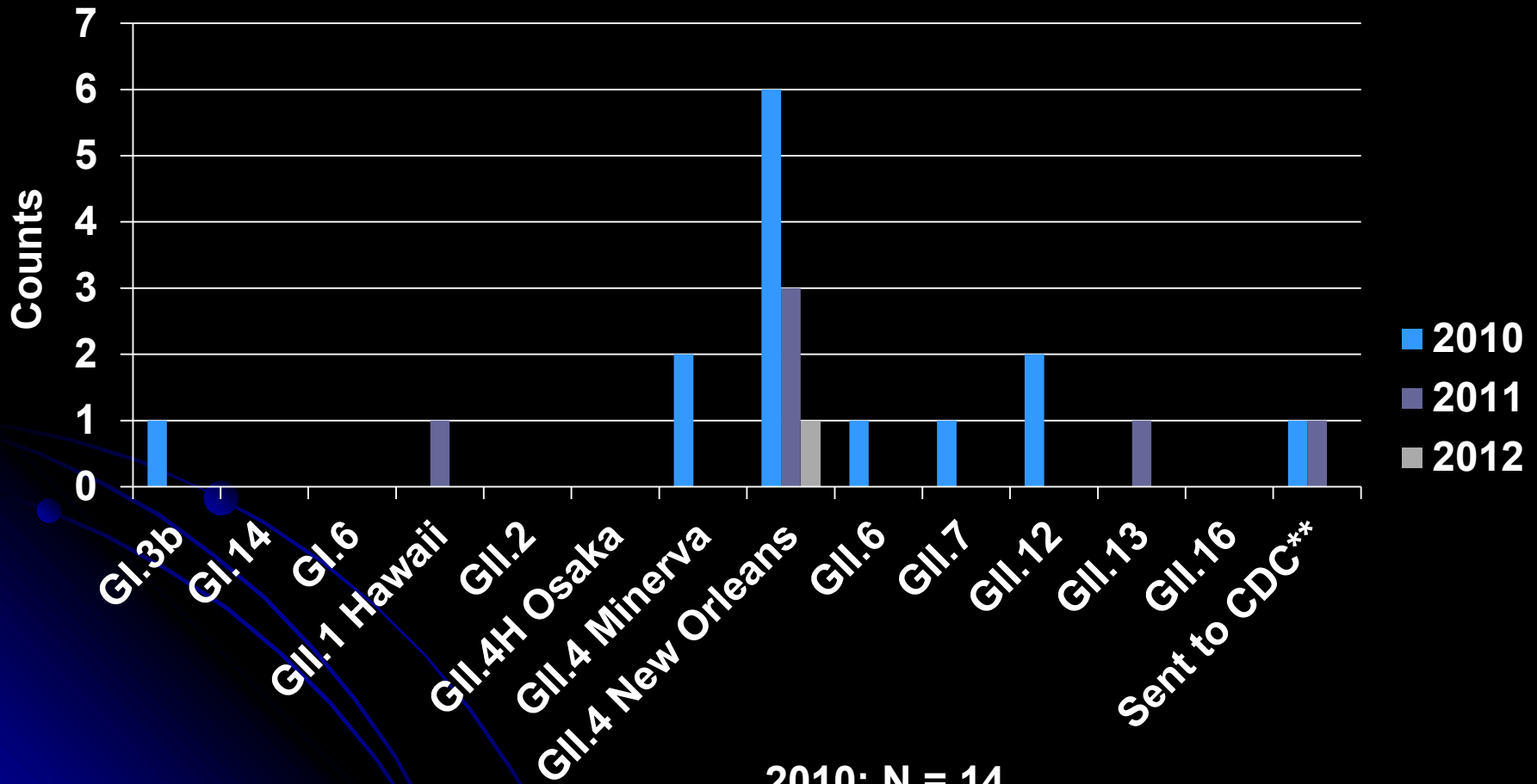
2011: N = 10

2012: N = 4

**Additional sequencing is required for samples sent to the CDC.

* As of April 2, 2012

Region 5: Norovirus PCR Sequencing Results, Michigan 2010-2012*



2010: N = 14

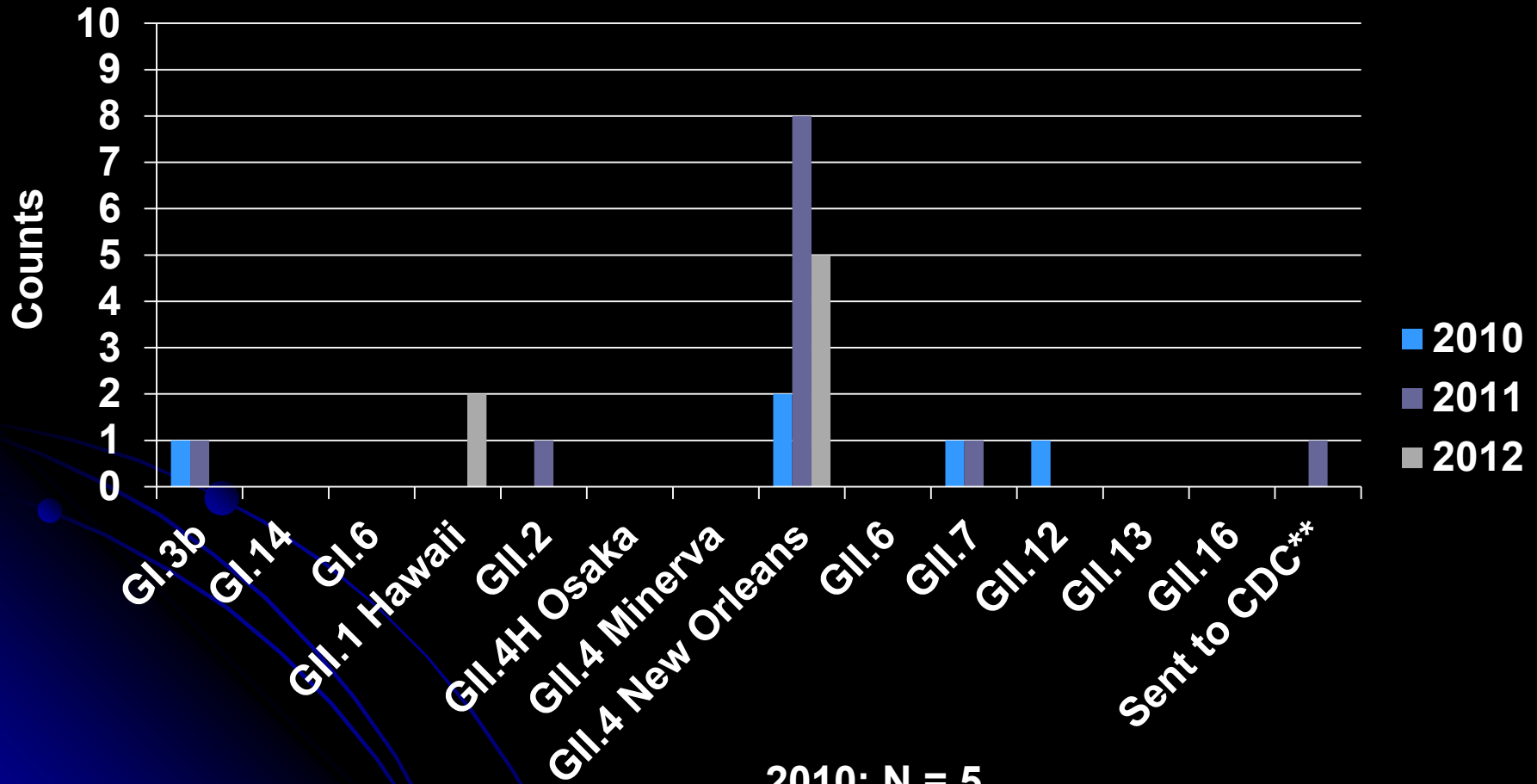
2011: N = 6

2012: N = 1

**Additional sequencing is required for samples sent to the CDC.

* As of April 2, 2012

Region 6: Norovirus PCR Sequencing Results, Michigan 2010-2012*

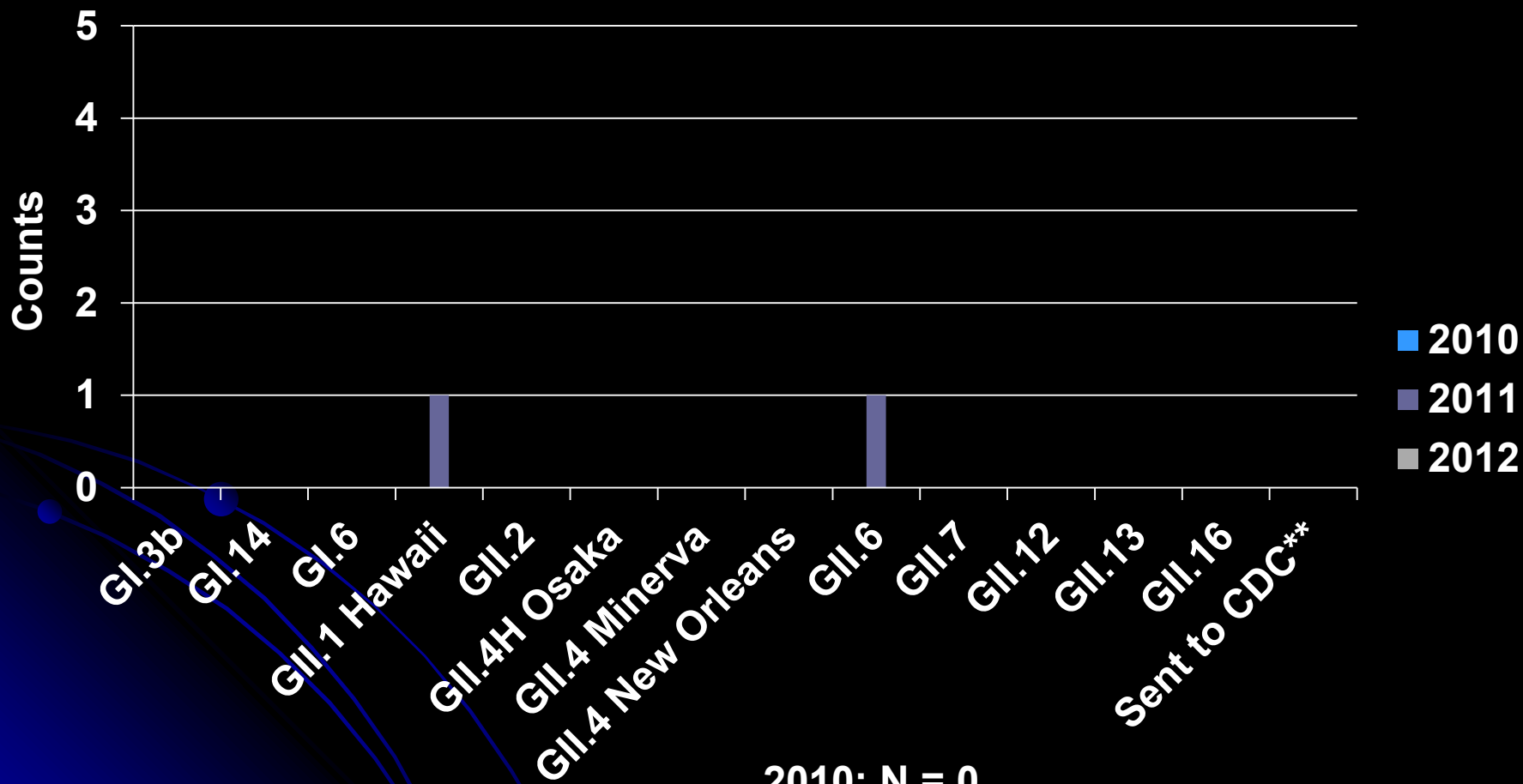


2010: N = 5
 2011: N = 12
 2012: N = 7

**Additional sequencing is required for samples sent to the CDC.

* As of April 2, 2012

Region 7: Norovirus PCR Sequencing Results, Michigan 2010-2012*



2010: N = 0

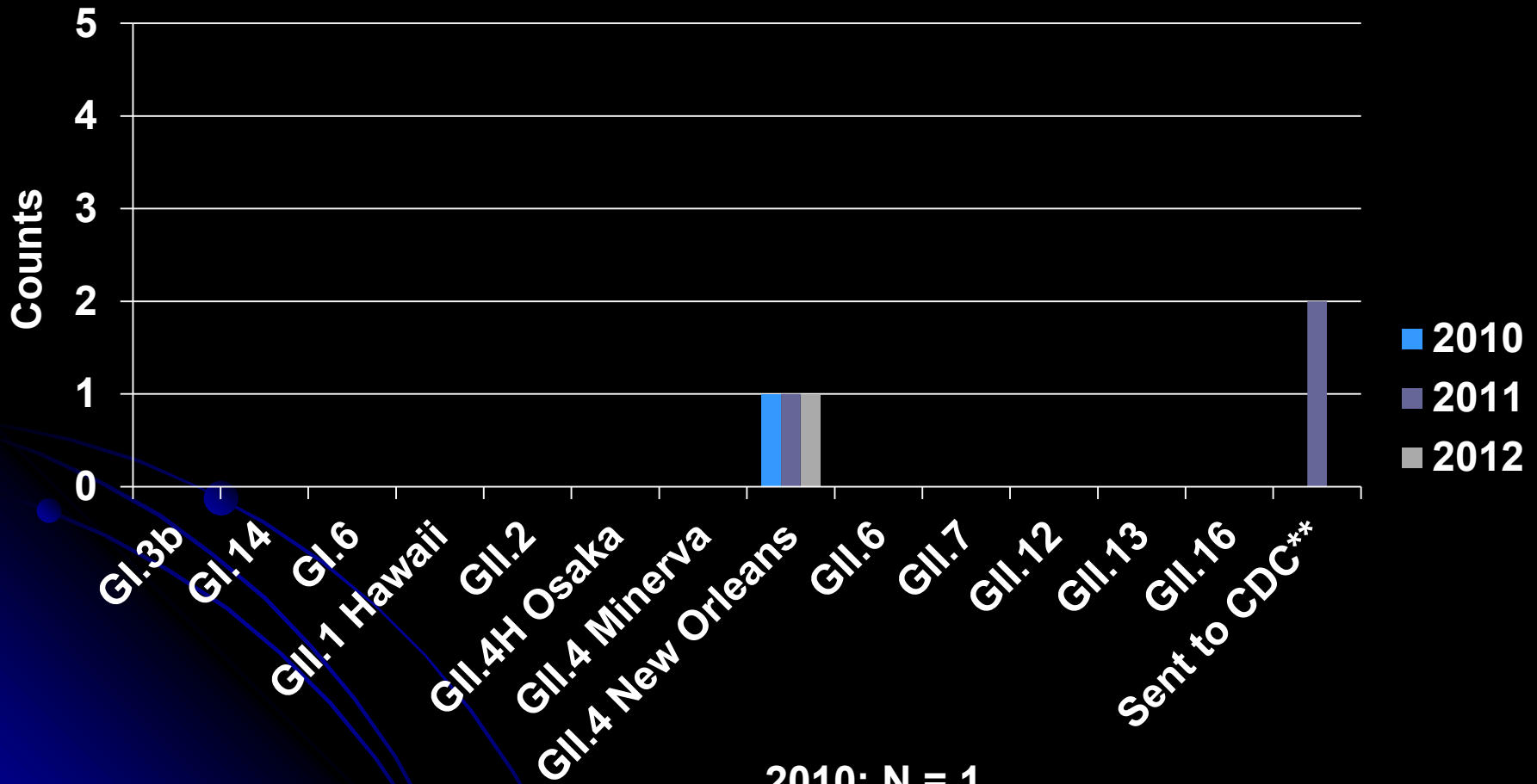
2011: N = 2

2012: N = 0

**Additional sequencing is required for samples sent to the CDC.

* As of April 2, 2012

Region 8: Norovirus PCR Sequencing Results, Michigan 2010-2012*



2010: N = 1
 2011: N = 3
 2012: N = 1

**Additional sequencing is required for samples sent to the CDC.

* As of April 2, 2012

Norovirus Resources

www.michigan.gov/cdinfo

- **General Norovirus Fact Sheet**
- **Guidelines for Environmental Cleaning and Disinfection of Norovirus**
- **Guidelines for the Control of a Suspected or Confirmed Outbreak of Viral Gastroenteritis in a Nursing Home**
- **Norovirus Investigations in Long Term Care Facilities: Things to Consider**

Questions

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