Viral Enteropathogens Infectious Diseases Report 2018

Enteric viruses are a major cause of acute gastroenteritis, especially among young children[1] as well as responsible for outbreaks in both health care and other institutions. Traditional diagnosis relied on antigen tests, however, newer multiplex molecular assays allow rapid detection of multiple enteric viruses.[1–3] In February 2016, viral enteropathogen multiplex PCR was introduced at Sullivan Nicolaides Pathology replacing the previously available antigen tests. Testing for viral enteropathogens at SNP is performed on request (Table 1).

The current multiplex PCR in use (the Seegene Allplex™ Gastrointestinal Virus real-time PCR platform) simultaneously detects norovirus (GI/GII), rotavirus, astrovirus, adenovirus 40/41 and sapovirus. All Australian states offer a funded rotavirus immunisation programme which commenced in July 2007. The current assay will detect vaccine derived rotavirus. Detection of vaccine derived rotavirus can occur at least 1-4 weeks after each dose and on occasions persist for 14 weeks.[4] Co-pathogen detection is not uncommon and the clinical significance of each in a given illness requires clarification.

Patient information links are available on the snp website.

Table 1: Additional faecal processing at SNP including enteric viral PCR

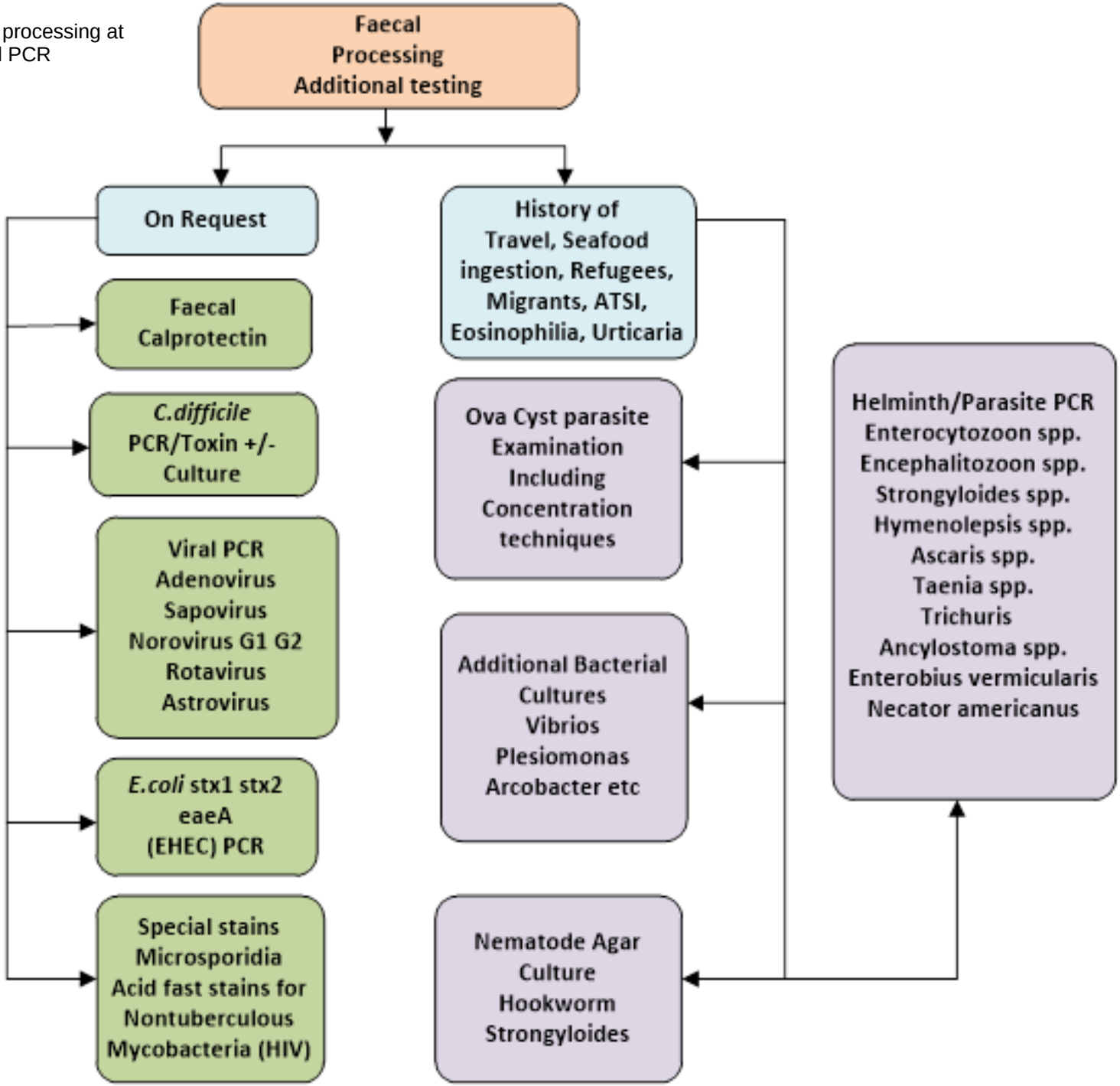


Figure 1: Total viral enteropathogens testing by week and % positivity (one or more) - 2018
Total episodes = 11810, Total episodes PCR + (one or more) = 2121

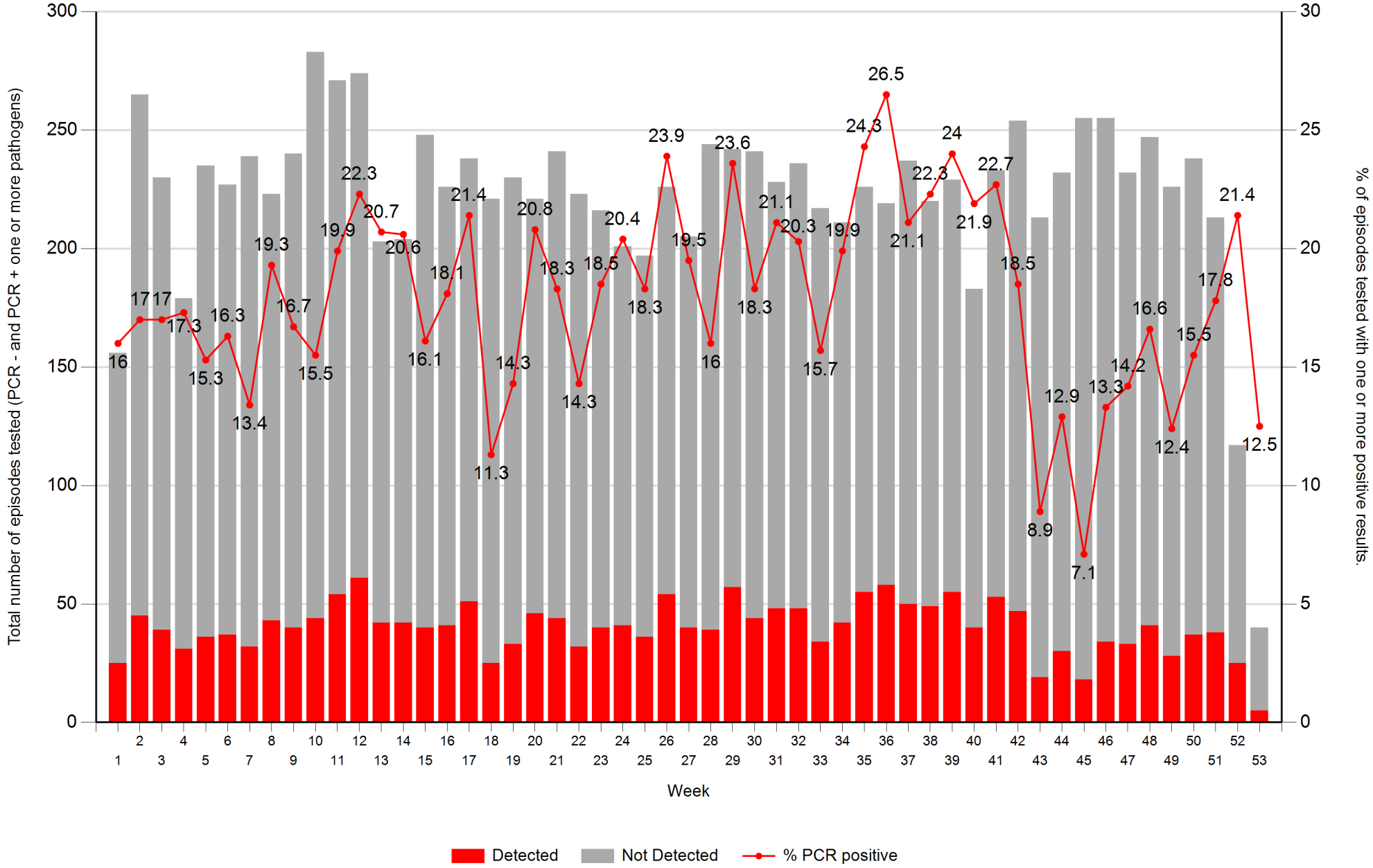
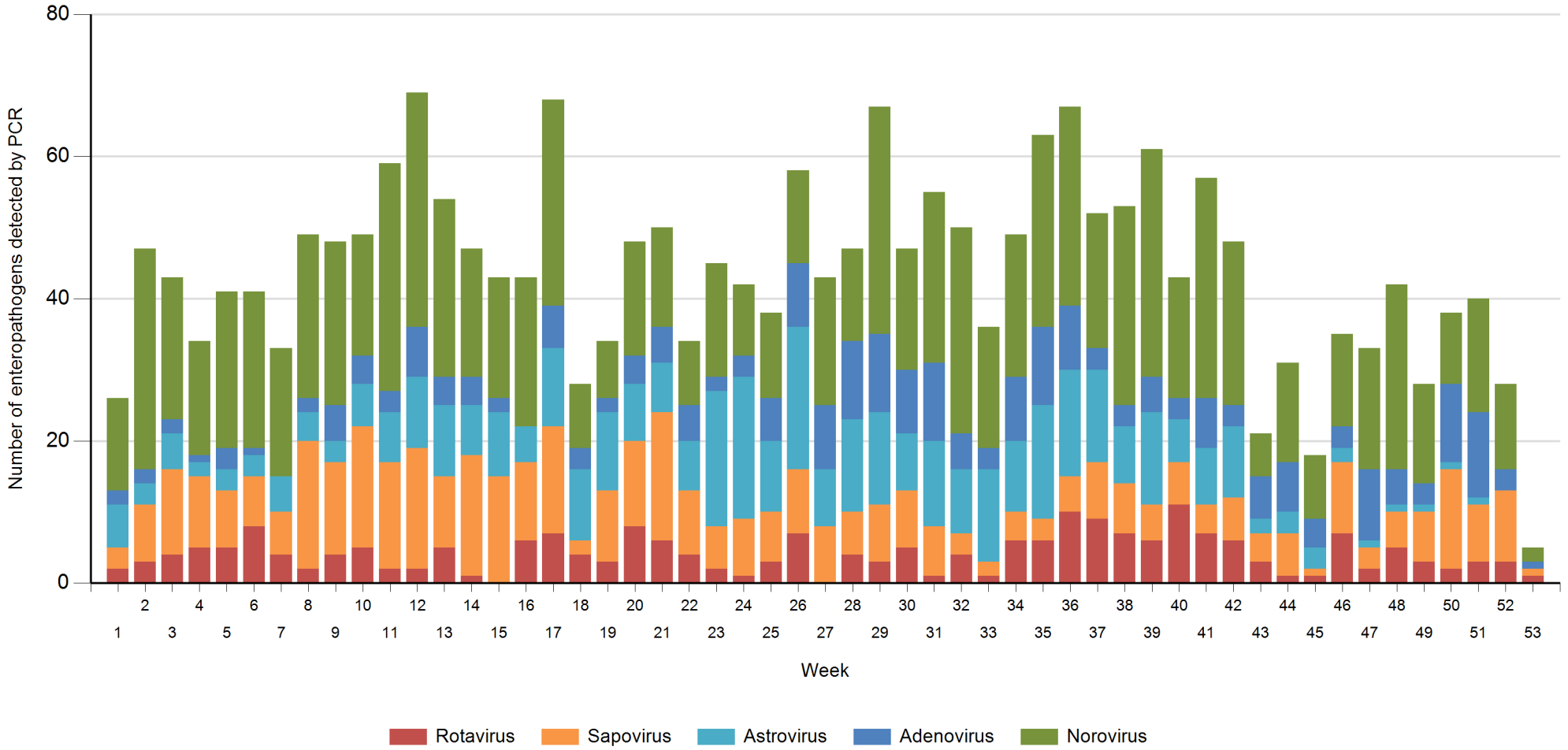
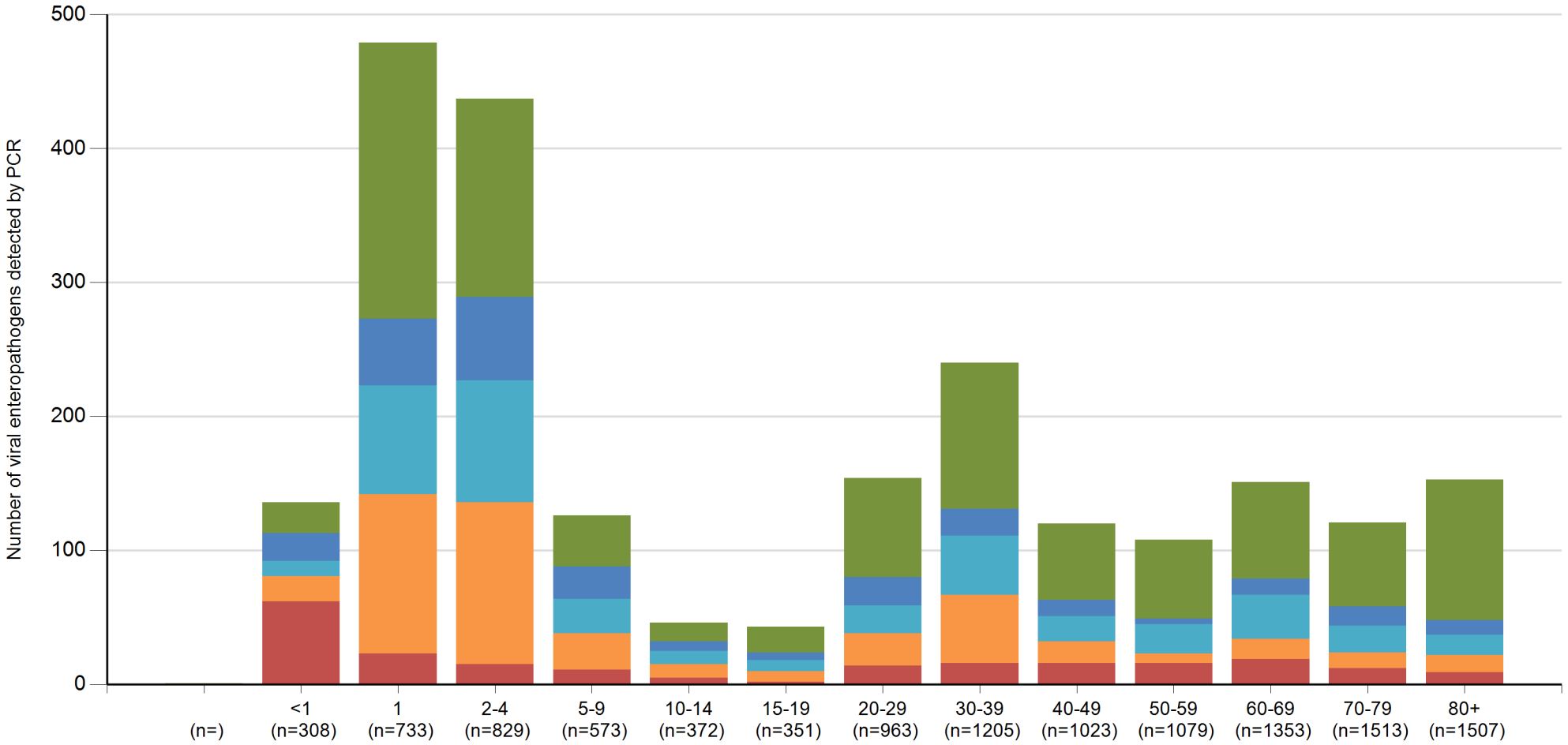


Figure 2: Distribution of all viral enteropathogens by Week - 2018



Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Rotavirus	2	3	4	5	5	8	4	2	4	5	2	2	5	1		6	7	4	3	8	6	4	2	1	3	7		4	3	5	1	4	1	6	6	10	9	7	6	11	7	6	3	1	1	7	2	5	3	2	3	3	1
Sapovirus	3	8	12	10	8	7	6	18	13	17	15	17	10	17	15	11	15	2	10	12	18	9	6	8	7	9	8	6	8	8	7	3	2	4	3	5	8	7	5	6	4	6	4	6	1	10	3	5	7	14	8	10	1
Astrovirus	6	3	5	2	3	3	5	4	3	6	7	10	10	7	9	5	11	10	11	8	7	7	19	20	10	20	8	13	13	8	12	9	13	10	16	15	13	8	13	6	8	10	2	3	3	2	1	1	1	1	1		
Adenovirus	2	2	2	1	3	1		2	5	4	3	7	4	4	2		6	3	2	4	5	5	2	3	6	9	9	11	11	9	11	5	3	9	11	9	3	3	5	3	7	3	6	7	4	3	10	5	3	11	12	3	1
Norovirus	13	31	20	16	22	22	18	23	23	17	32	33	25	18	17	21	29	9	8	16	14	9	16	10	12	13	18	13	32	17	24	29	17	20	27	28	19	28	32	17	31	23	6	14	9	13	17	26	14	10	16	12	2

Figure 3: Distribution of viral enteropathogens by age group - 2018



Rotavirus		62	23	15	11	5	2	14	16	16	16	19	12	9
Sapovirus		19	119	121	27	10	8	24	51	16	7	15	12	13
Astrovirus		11	81	91	26	10	8	21	44	19	22	33	20	15
Adenovirus		21	50	62	24	7	6	21	20	12	4	12	14	11
Norovirus	1	23	206	148	38	14	19	74	109	57	59	72	63	105

Figure 4a: Distribution of Norovirus G1 and G2 by age group and % positivity - 2018

Figure 4b: Distribution of Rotavirus by age group and % positivity - 2018

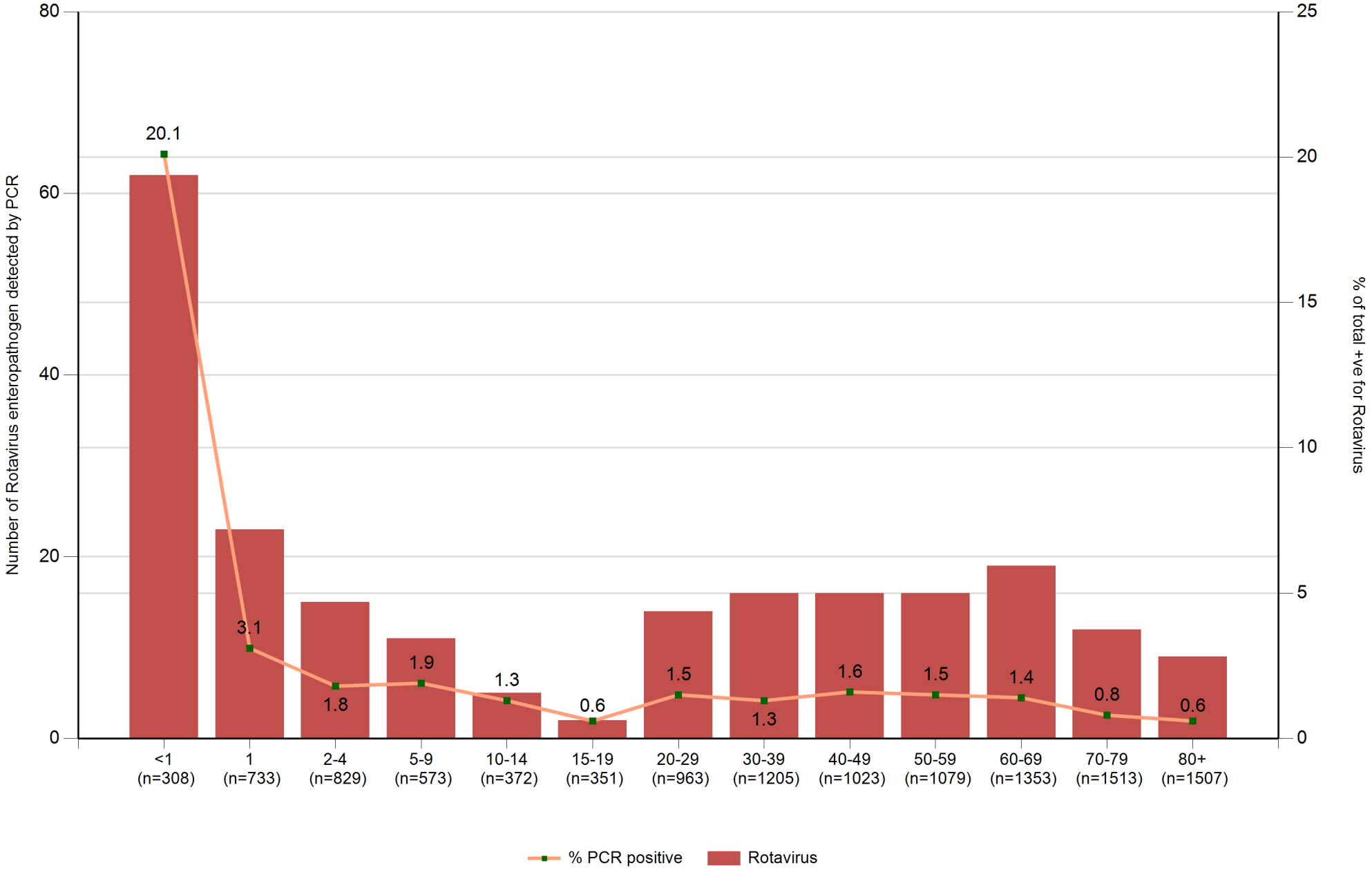


Figure 4c: Distribution of Adenovirus by age group and % positivity - 2018

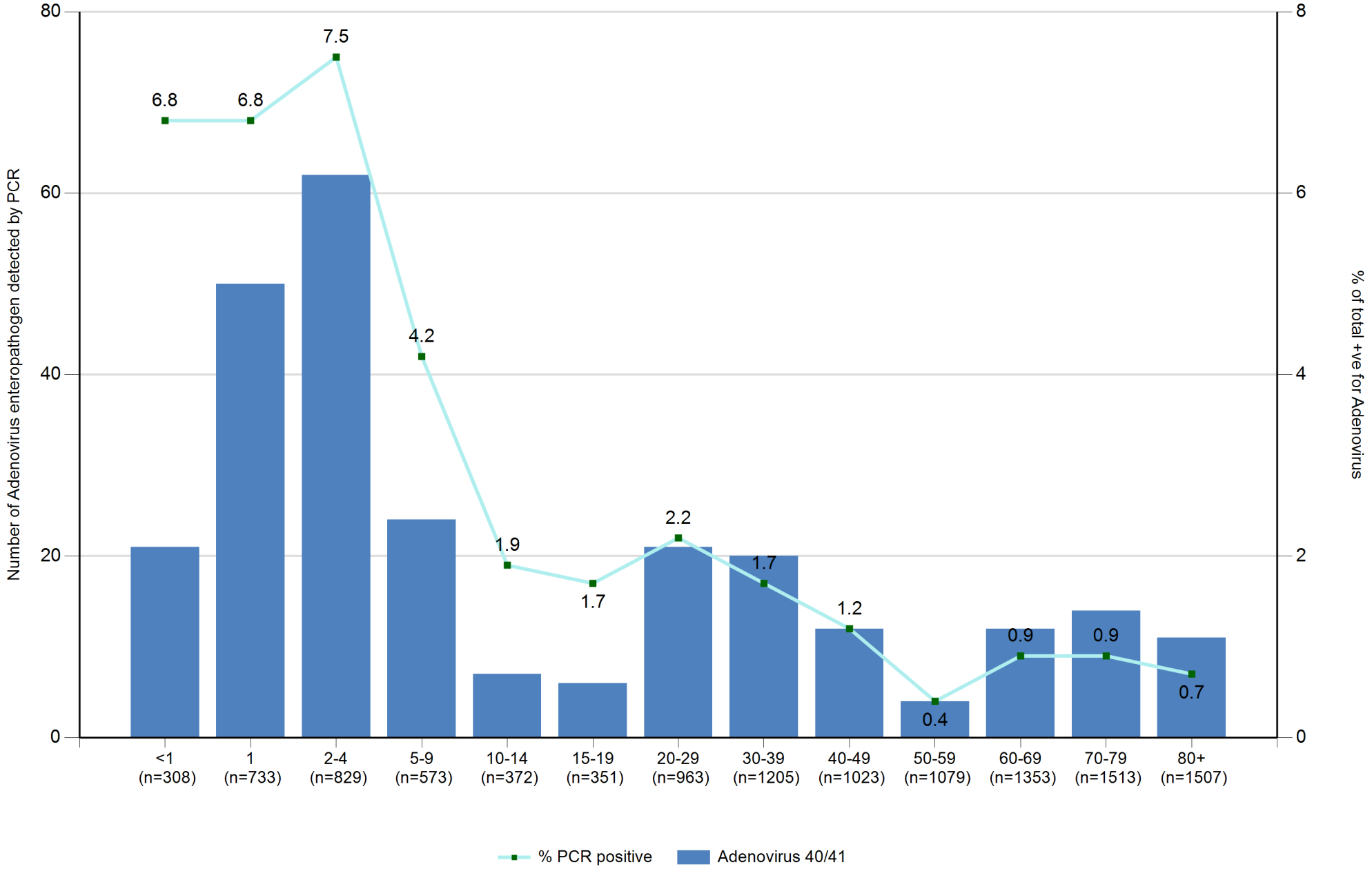


Figure 4d: Distribution of Astrovirus by age group and % positivity - 2018

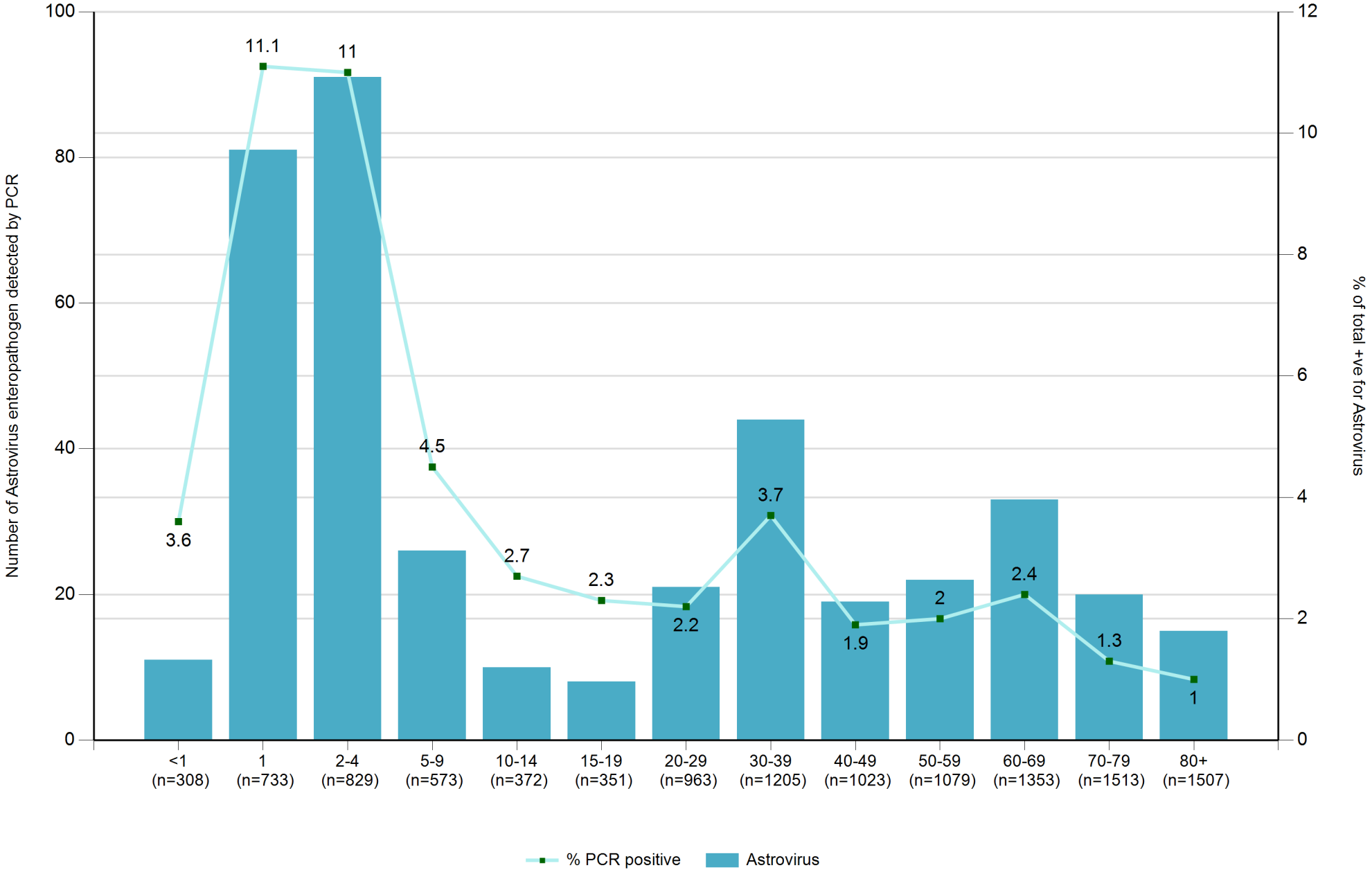


Figure 4e: Distribution of Sapovirus by age group and % positivity - 2018

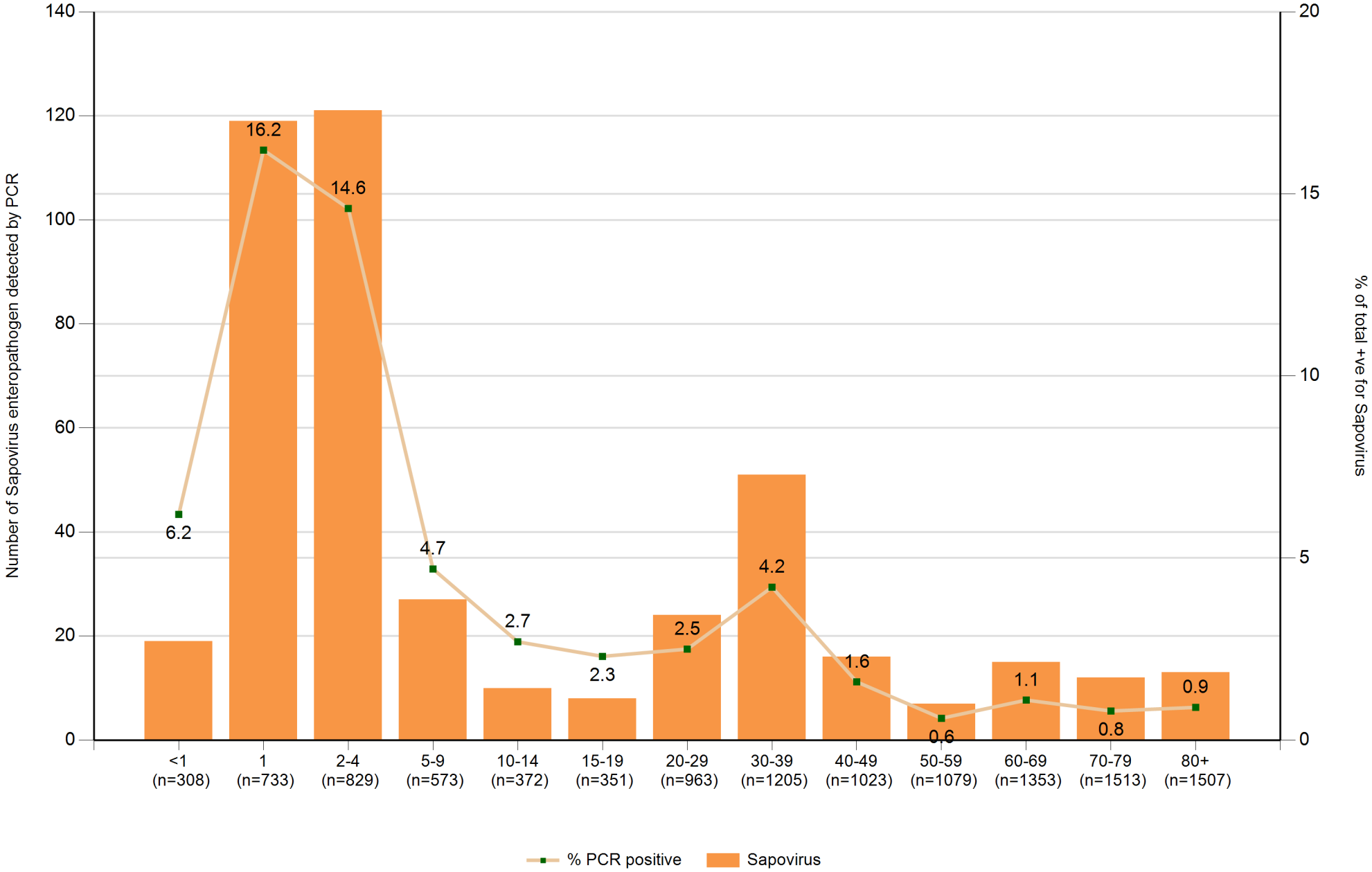


Figure 5a: Distribution of Norovirus G1 and G2 by week and % positivity (G1 and or G2) - 2018

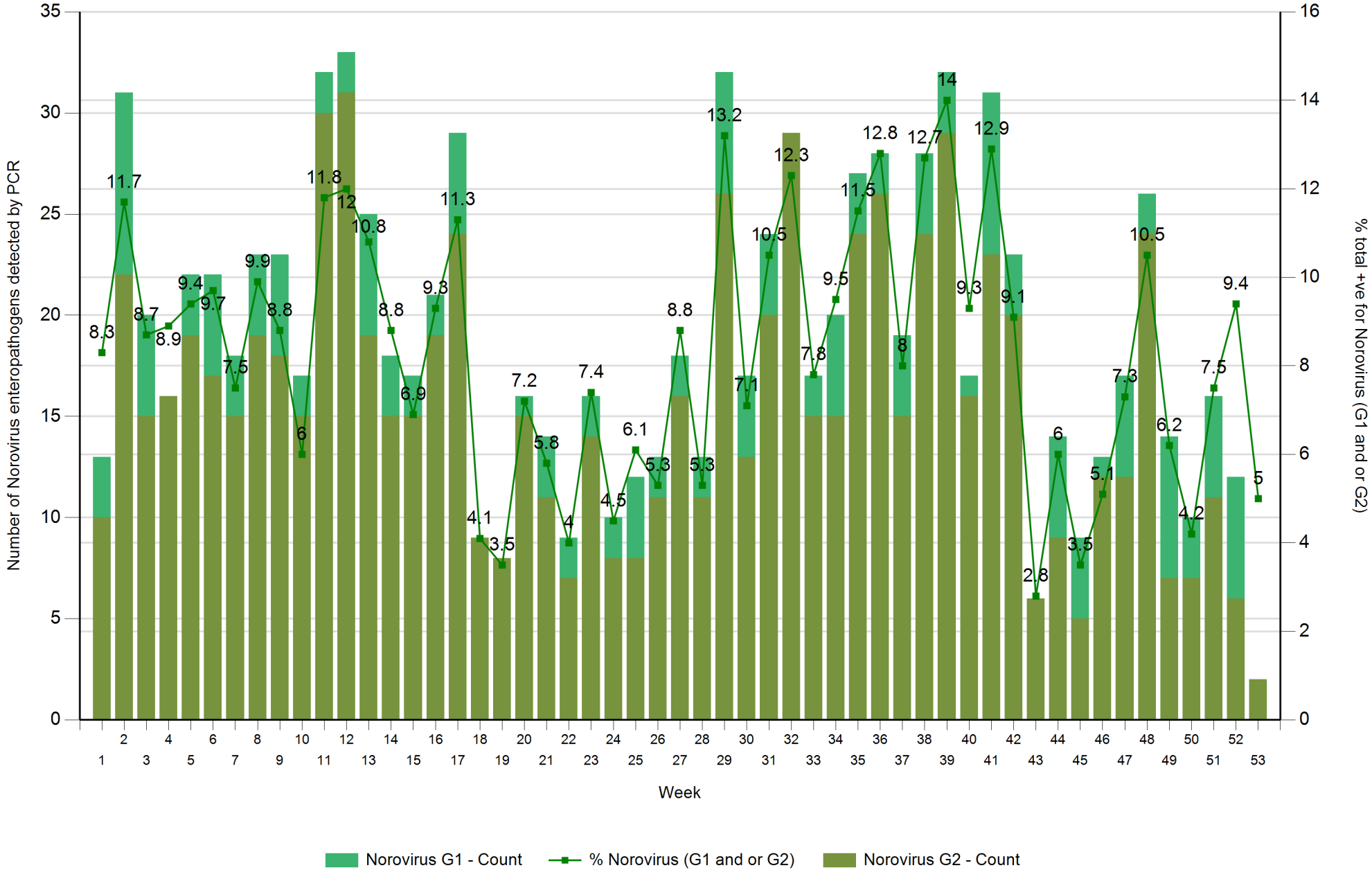


Figure 5b: Distribution of Rotavirus by week and % positivity - 2018

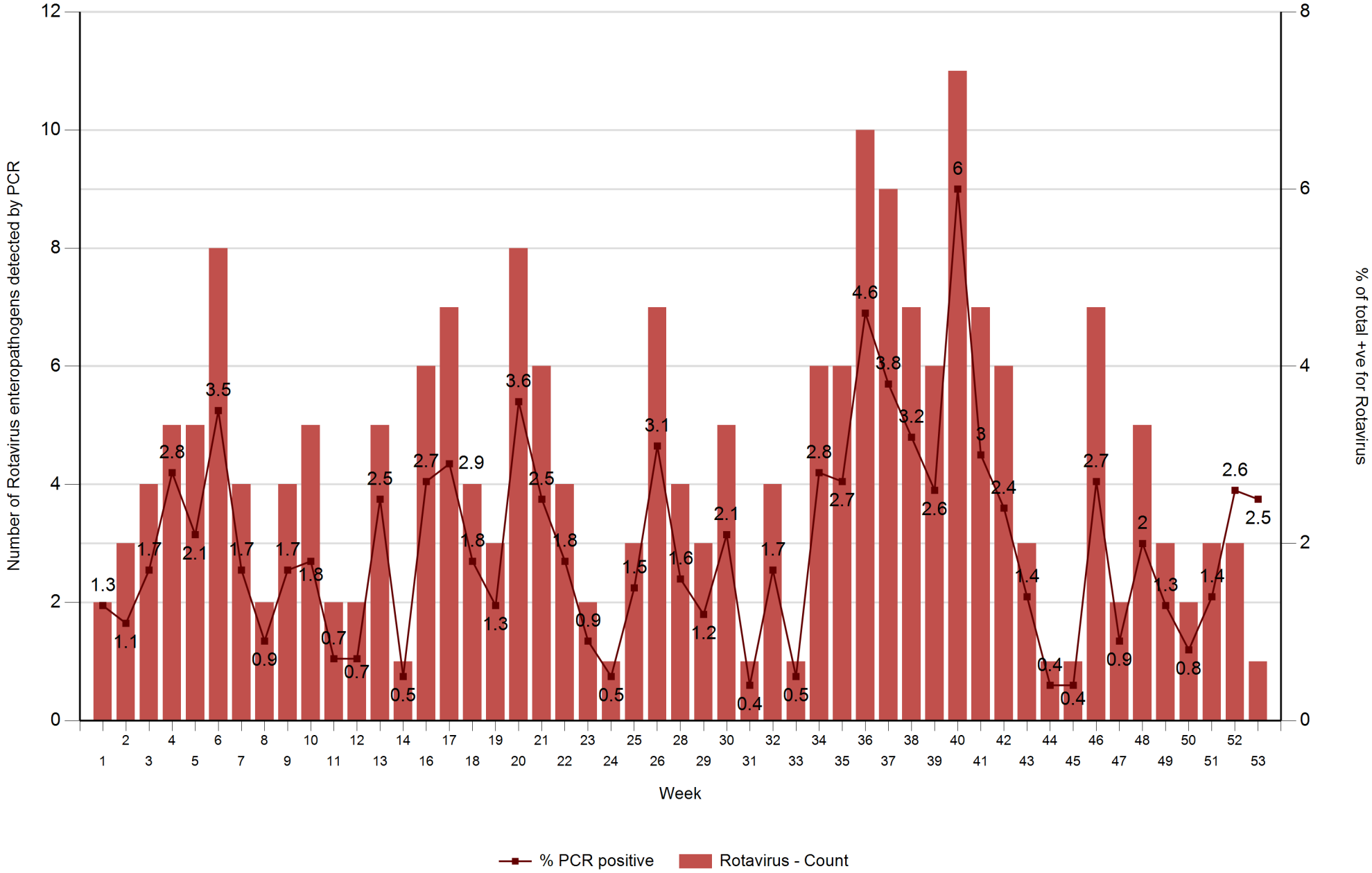


Figure 5c: Distribution of Adenovirus by week and % positivity - 2018

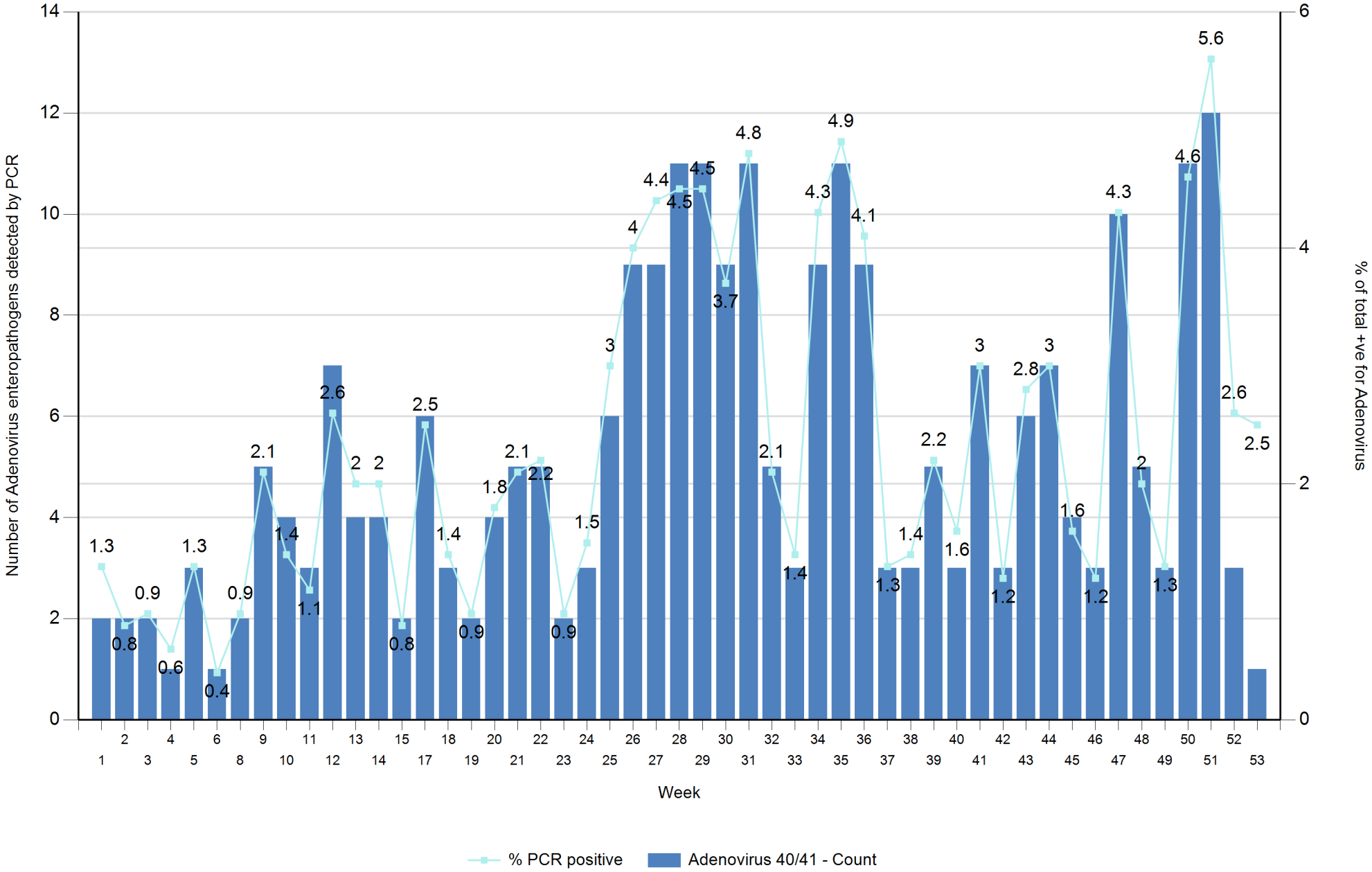


Figure 5d: Distribution of Astrovirus by week and % positivity - 2018

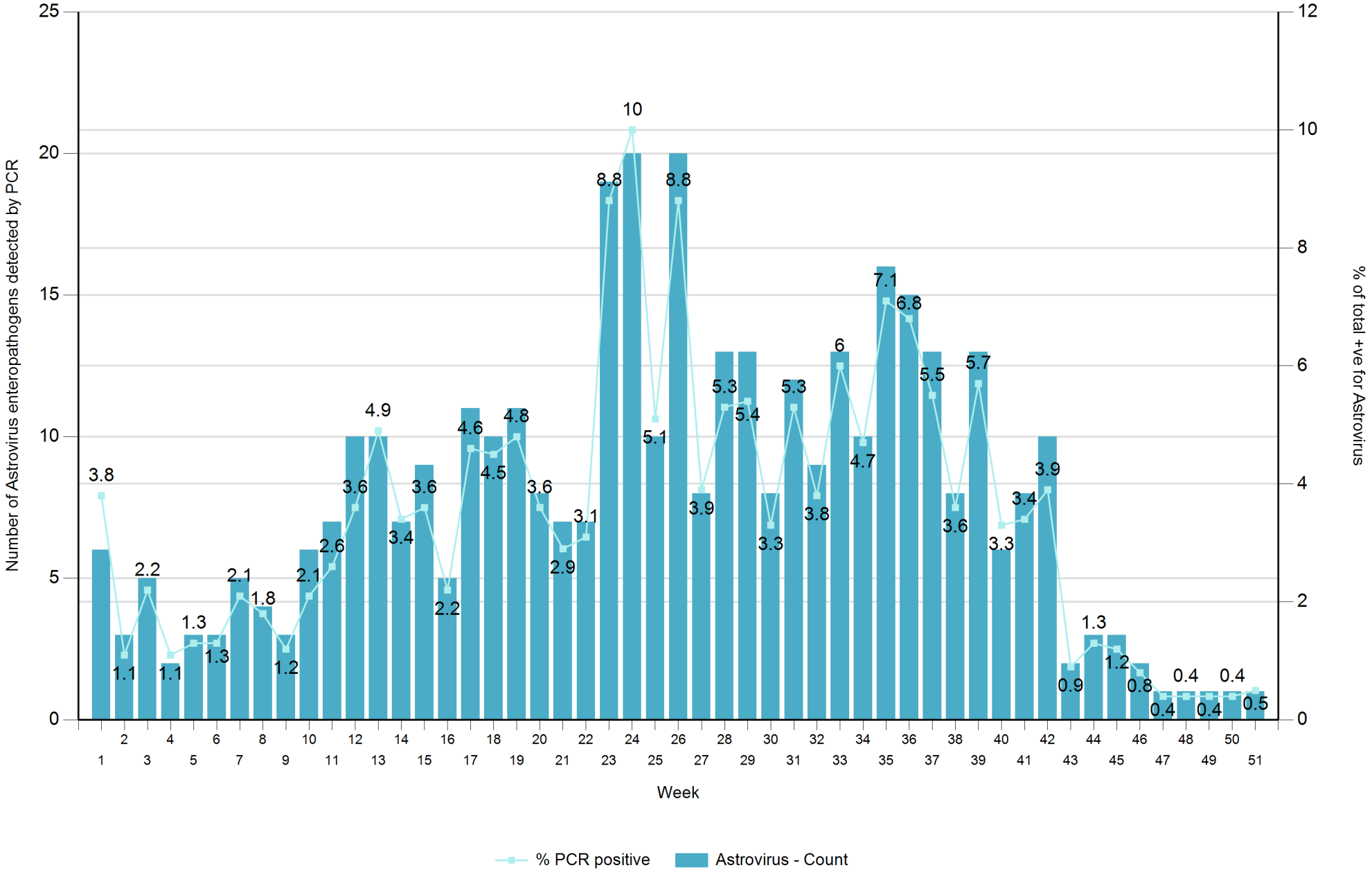


Figure 5e: Distribution of Sapovirus by week and % positivity - 2018

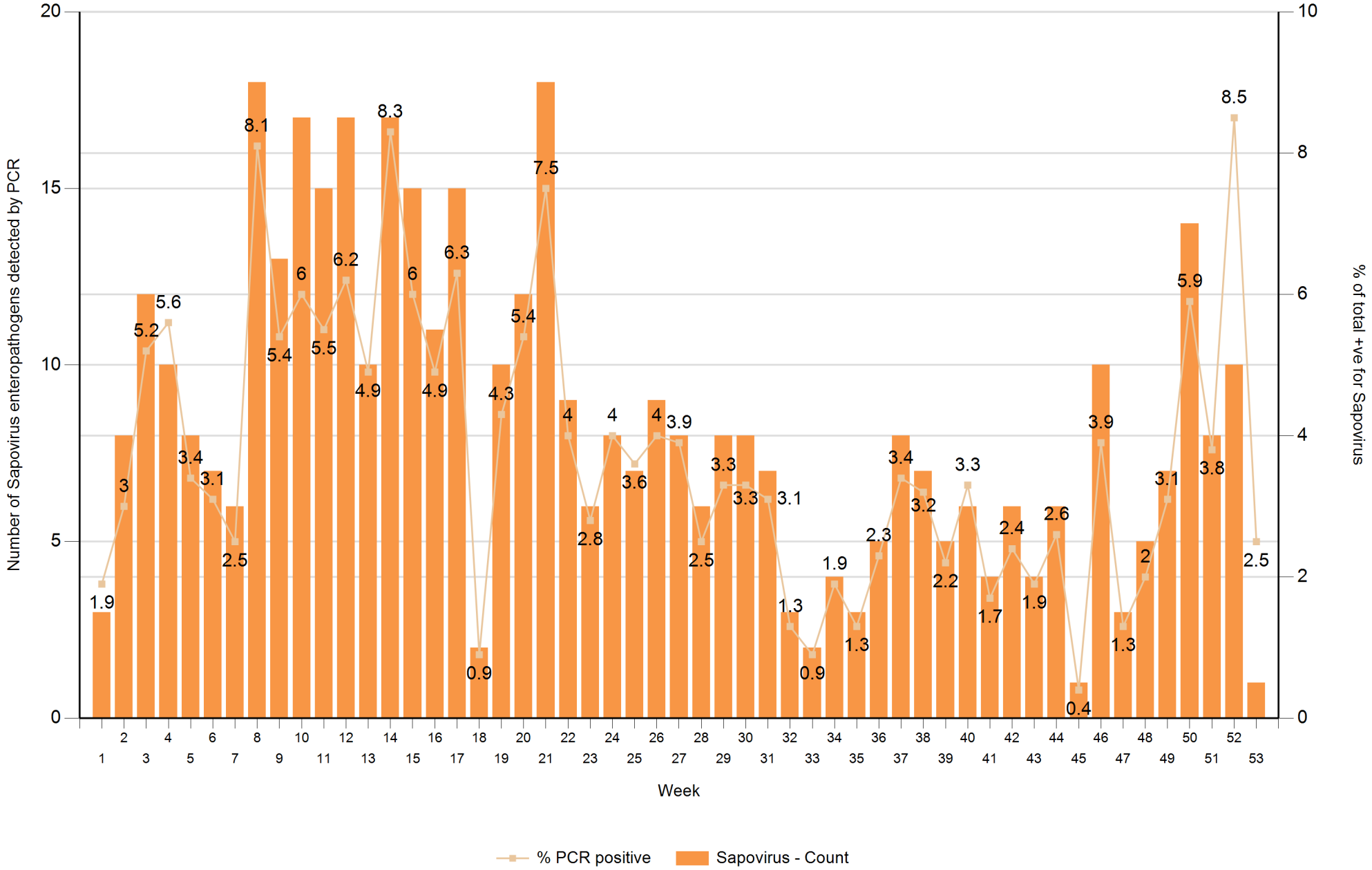


Figure 6: Distrubution of virus by year and % positivity

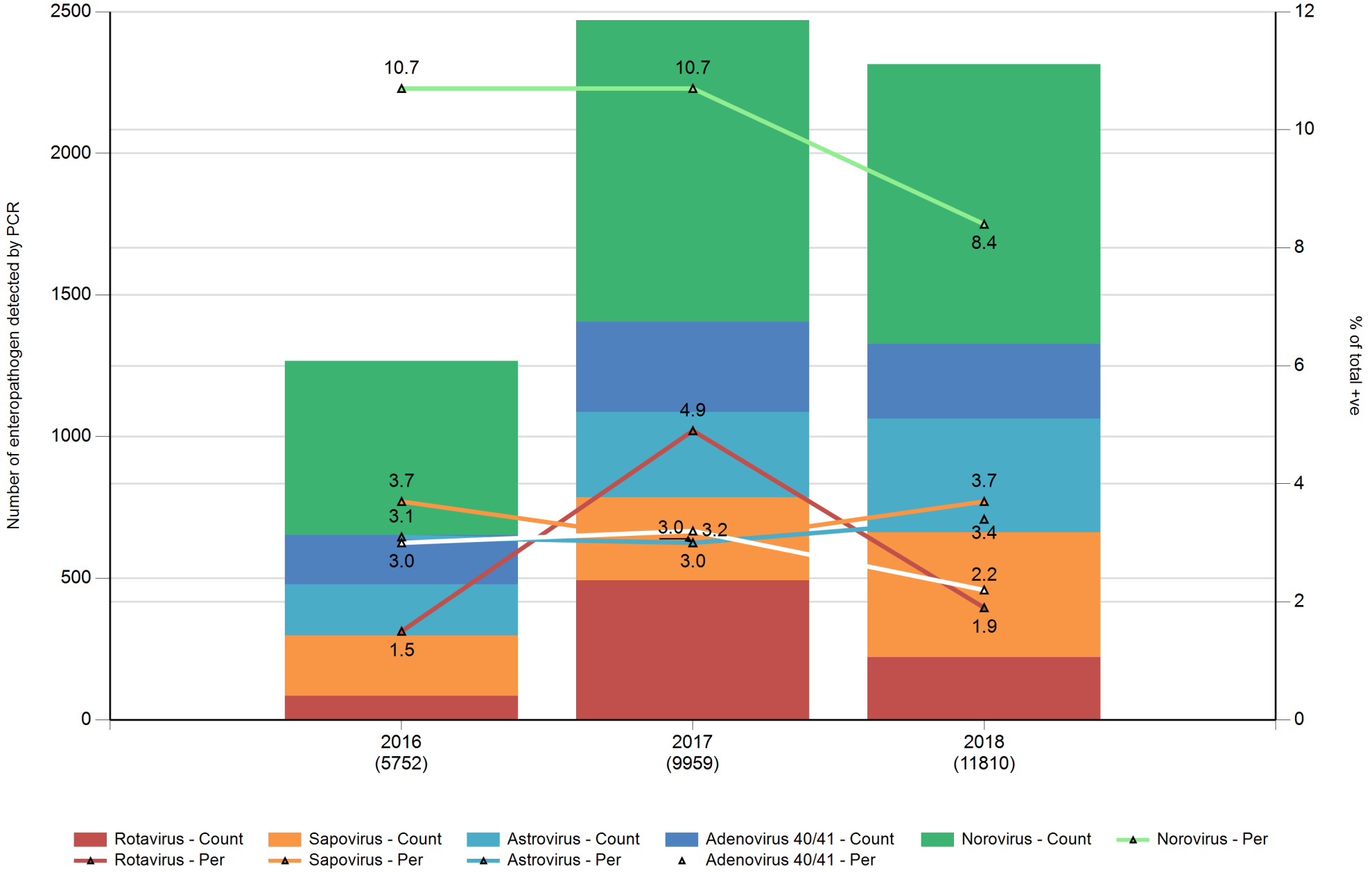


Figure 7: Co-pathogen detection - 2018	
Total number of epidodes positive (one or more)	**2121**
1 x pathogen total	**1940**
Sapovirus	374
Rotavirus	179
Norovirus	848
Astrovirus	325
Adenovirus	214
2 x pathogen total	**168**
Sapovirus, Rotavirus	9
Norovirus, Sapovirus	40
Norovirus, Rotavirus	22
Norovirus, Astrovirus	42
Norovirus, Adenovirus	24
Astrovirus, Sapovirus	10
Astrovirus, Rotavirus	1
Adenovirus, Sapovirus	5
Adenovirus, Astrovirus	15
3 x pathogen total	**13**
Norovirus, Sapovirus, Rotavirus	1
Norovirus, Astrovirus, Sapovirus	2
Norovirus, Astrovirus, Rotavirus	3
Norovirus, Adenovirus, Rotavirus	4
Norovirus, Adenovirus, Astrovirus	2
Astrovirus, Sapovirus, Rotavirus	1

References

1. Binnicker MJ. Multiplex Molecular Panels for Diagnosis of Gastrointestinal Infection: Performance, Result Interpretation, and Cost-Effectiveness. Journal of Clinical Microbiology. 2015;53(12):3723-8.
2. Khare R, Journal of Clinical Microbiology 2014;52(10):3667-73, et al. Comparative evaluation of two commercial multiplex panels for detection of gastrointestinal pathogens by use of clinical stool specimens.
3. McAuliffe GN, et al. Systematic application of multiplex PCR enhances the detection of bacteria, parasites, and viruses in stool samples. The Journal of Infection. 2013;67(2):122-9.
4. Whiley DM, et al Over diagnosis of rotavirus infection in infants due to the detection of vaccine virus. Clinical Infectious Diseases 2019 December 18.