

By David C. Wilson—September 10, 2021

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Snapshot: Horry County Schools—Active Cases and Quarantine

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I. Introduction

This paper summarizes and closely examines active COVID-19 cases among Horry County Schools (HCS) staff and students. In addition, it provides a summary of HCS staff and students who are in quarantine because of COVID-19. Considering the transmissibility of COVID-19, this paper is a snapshot of the current magnitude of the disease in the HCS school district. The HCS district comprises almost 45,000 students, and everything rests on the uncertainty surrounding COVID-19. These 45,000 students and their parents, guardians, and teachers spent the summer with high hopes of returning to the brick-and-mortar school environment for the 2021–2022 school year. Unfortunately, these hopes have been shattered, even before the students could get through their first marking period.

HCS began data collection for their dashboard on September 8, 2020. Active Staff Case means that the employee has received a South Carolina Department of Health and Environmental Control (SCDHEC)-confirmed positive test result for COVID-19. Quarantine denotes the

cont.

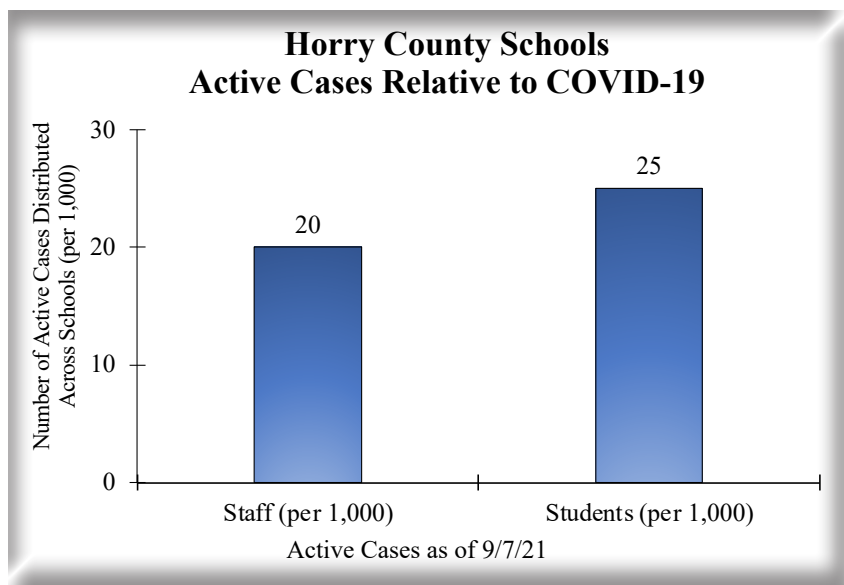


Figure 1.1 COVID-19 active cases per 1,000

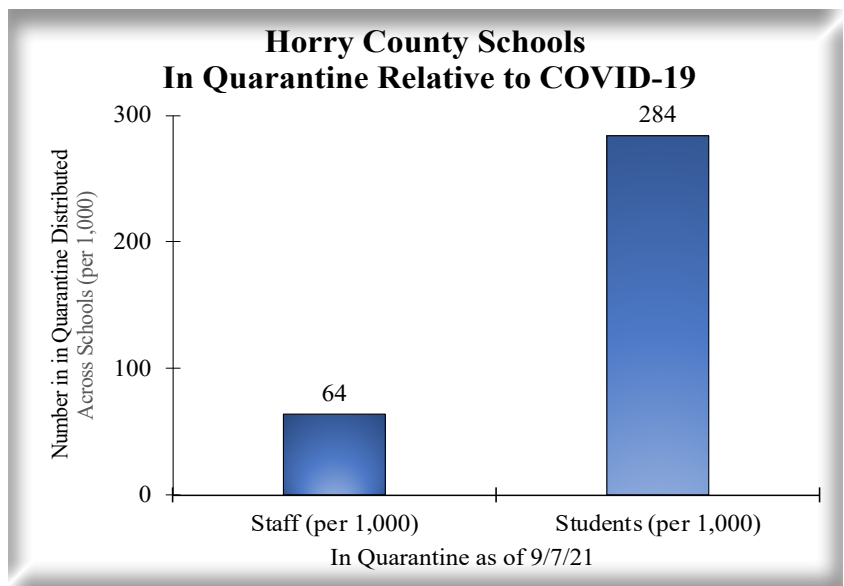


Figure 1.2 COVID-19 in quarantine per 1,000

“Without data, you are just one more person with an opinion”

I. Introduction, cont.

total number of staff members who have not received a positive test result but are currently excluded at the direction of the SCDHEC and/or HCS because they are either a close contact of a person with a SCDHEC-confirmed positive test result or they are exhibiting flu-like symptoms (SCDHEC, 2021).

In examining the HCS, this paper depicted active and quarantine cases using various formats. Thus, readers can browse the paper easily and gain a clear picture of the situation with active and quarantine cases, usually on one page. For example, the Pareto charts show the schools in order, with the highest to the lowest active cases and quarantine cases for the staff and students. The Pareto charts were intended to provide quick-glance information on how each child's school was doing on its own and in comparison to other schools (see Figure 3.2). Additional graphs were included for graphical comparisons (see Figure 4.1).

The tabular and graphical analyses shown in Table 2.1 and Figures 2.1 and 2.2, and employed a color code scheme. The scheme used three colors—green, yellow, and red—to represent active and quarantine cases. The colors were used to designate the distribution of active and quarantine cases for staff and students in the HCS system. Green represents the count for schools with staff and students in the 25th percentile (first quartile), yellow represents the count for schools between the 25th and 75th percentiles (interquartile), and red represents schools in the 75th percentile (middle of the third quartile) or higher. The determination of cutoffs for the various percentiles was based on the number of active and quarantine cases as of September 7, 2021. The number of cases determined the percentiles used for the three intervals and quarantine cases for each of the 50 schools used for this paper. The purpose of the color-coded scheme is to show the distribution in terms of magnitude for these two parameters within the HCS school district. For example, the first quarter or 25th percentile had no active cases (the count is zero) in the first quarter, whereas the 25th percentile for quarantine cases ranged from zero to

55. For example, Loris High School had zero staff with active cases, which placed the school's staff in the first quartile (25th percentile), whereas Loris Middle School placed in the third quartile (75th percentile) for its staff members with active cases (see Table 2.1 and the quartile/percentile diagram in Figure 1.3). In no way do the color-coded percentile or quartile suggest or imply one school is better than another school; rather, they provide a close-up examination and summary of the distribution of active COVID-19 cases and those in quarantine as depicted in the example about Loris High and Loris Middle schools.

By showing the rates of cases and deaths as 1,000, 10,000, or 100,000 per capita, this paper depicts the true weight of the situation and enables valid comparisons to other states and counties, between states and counties, between demographics, and so on. For example, Conway High School (CHS) had 16 active cases, while Carolina Forest (CFHS) had 21 active cases. It would appear from the raw counts that CFHS fared worse than CHS; however, a comparison of the difference in their rates of cases per 1,000 indicates the true measure, with CFHS at four active cases per 1,000 and CHS at 11 active cases per 1,000. Consequently, when COVID-19 measures are not discussed in the context of per capita, it fosters unnecessary fear in the public mind.

Although active COVID-19 cases for the staff are less than students', this difference is statistically insignificant. The nonparametric Mann-Whitney model was used for this test. The test was performed at the 95% confidence level. Hence, the conclusion is based on the true per capita measure used in this paper: 1,000.

The difference between staff in quarantine and students in quarantine is statistically significant based on the results of the nonparametric Mann-Whitney model at 95% confidence level. Hence, the conclusion is based on the true per capita measure used in this paper: 1,000.



I. Introduction, cont.

The diagram in Figure 1.3 (shown below) is meant to be a refresher on quartiles and percentiles. A quartile simply defines as a statistical term that describes a division of observations into four defined intervals based on the values of the data and how they compare to the entire set of observations. Moreover, the percentile can be defined as a value below which a percentage of

data falls. Therefore, the observations of the active cases and in quarantine of HCS staff and students relative to COVID-19 were mapped into defined intervals based on the number reported from each school in the HCS district to compare with the entire counts of staff and in quarantine.

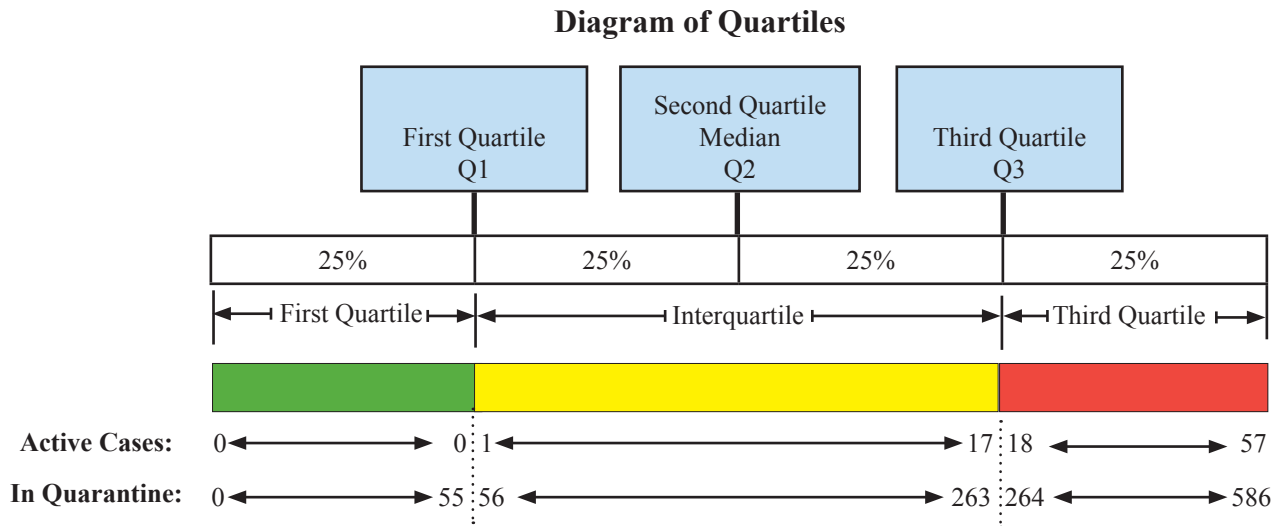


Figure 1.3 Quarantiles diagram

Part II
Horry County Schools

Colored-Coded Analysis of Staff and
Students by School Relative to Active
Cases and Quarantine

II. Tabular Analysis of Staff and Students as of 9/7/21

Table 2.1 is the basis for all graphs shown in this paper. The emphasize as mentioned in the introduction, measurements are depicted cases and in quarantine as 1K, 10K, or 100K per capita. To that end, this paper depicts the true weight of the measurements and enables valid comparisons

to other states and counties, between states and counties, between demographics, and so on.

See introduction (Paragraph I) for an explanation of the color-coded scheme.

Table 2.1 Tabular distribution of COVID-19 cases among staff and students by school.

List of District Schools	Headcount		Active COVID-19 Cases per 1000		COVID-19 Quarantine per 1000	
	Staff	Students	Staff	Students	Staff	Students
Horry County Schools	4,670	43,197	20	25	64	284
Aynor Elementary	75	775	0	15	93	319
Aynor High School	75	838	0	16	0	415
Aynor Middle	63	740	48	0	95	523
Black Water Middle	69	766	0	37	43	266
Burgess Elementary	63	659	0	5	32	188
Carolina Forest Elementary	102	1,123	20	14	29	55
Carolina Forest High	159	2,630	0	4	13	94
Conway Elementary	64	603	0	20	16	202
Conway High	117	1,458	0	11	103	549
Conway Middle	55	572	0	19	145	236
Daisy Elementary	67	577	30	5	15	121
Forestbrook Elementary	89	887	0	15	11	170
Forestbrook Middle	69	869	14	8	0	249
Green Sea Floyds Elementary	62	537	0	4	16	244
Green Sea Floyds Middle & High	79	684	38	20	89	545

Legend:

	<u>First Quartile Range</u>	<u>Interquartile Range</u>	<u>Third Quartile Range</u>	
Active cases:	0-0	1-17	Equal to or greater than 18	
Quarantine:	0-55	56-264	Equal to or greater than 265	

Source: Horry County Schools COVID-19 Cases Dashboard and South Carolina Department of Education









II. Tabular Analysis of Staff and Student Active Cases as of 9/7/21

Table 2.1. Tabular distribution of COVID-19 cases among staff and students by school.

List of District Schools	Headcount		Active COVID-19 Cases per 1000		COVID-19 Quarantine per 1000	
	Staff	Students	Staff	Students	Staff	Students
HCS Early College High	30	320	0	6	0	88
Homewood Elementary	68	626	0	6	15	115
Kingston Elementary	50	426	0	33	80	279
Lakewood Elementary	85	875	0	8	24	254
Loris Elementary	84	782	12	27	119	405
Loris High	77	713	0	18	78	445
Loris Middle	70	705	57	30	329	452
Midland Elementary	54	542	19	6	56	234
Myrtle Beach Early Childhood	64	464	16	0	16	231
Myrtle Beach Elementary	78	1,032	0	16	77	308
Myrtle Beach High	106	1,395	0	3	47	230
Myrtle Beach Middle	89	1,225	11	7	101	284
Myrtle Beach Primary	66	640	15	3	30	169
North Myrtle Beach High	100	1,453	10	5	10	348
North Myrtle Beach Middle	90	1,204	22	16	56	507
Ocean Bay Elementary	76	969	13	14	66	284
Ocean Bay Middle	51	664	0	26	98	586
Ocean Drive Elementary	77	785	13	5	0	162

Legend:

	<u>First Quartile Range</u>	<u>Interquartile Range</u>	<u>Third Quartile Range</u>
Active cases:	 0-0	 1-17	 Equal to or greater than 18
Quarantine:	 0-55	 56-264	 Equal to or greater than 265

Source: Horry County Schools COVID-19 Cases Dashboard and South Carolina Department of Education



II. Tabular Analysis of Staff and Student Active Cases

Table 2.1 Tabular distribution of COVID-19 cases among staff and students by school.

List of District Schools	Headcount		Active COVID-19 Cases per 1000		COVID-19 Quarantine per 1000	
	Staff	Students	Staff	Students	Staff	Students
Palmetto Bays Elementary	64	566	0	7	31	261
Pee Dee Elementary	86	760	0	14	70	334
River Oaks Elementary	97	1,111	10	15	31	301
Riverside Elementary	66	613	15	3	15	119
Seaside Elementary	53	466	0	2	19	133
Socastee Elementary	85	789	0	4	59	229
Socastee High	125	1,540	0	7	64	329
Socastee Middle	45	528	44	9	156	288
South Conway Elementary	67	600	30	5	75	203
St. James Elementary	74	779	27	6	68	286
St. James High	124	1,660	24	11	65	196
St. James Intermediate	70	827	0	7	100	451
St. James Middle	76	913	13	27	92	350
Ten Oaks Middle	78	1,066	26	28	115	485
Waccamaw Elementary	89	887	11	12	34	154
Waterway Elementary	69	746	0	13	58	197
Whittemore Park Middle	79	808	38	15	114	188

Legend:

	First Quartile Range	Interquartile Range	Third Quartile Range
Active cases:	 0–0	 1–17	 Equal to or greater than 18
Quarantine:	 0–55	 56–264	 Equal to or greater than 265

Source: Horry County Schools COVID-19 Cases Dashboard and South Carolina Department of Education



II. Graphical Summary of Schools Active Cases Relative to COVID-19

Percentage Distribution of Schools With COVID-19 Active Cases

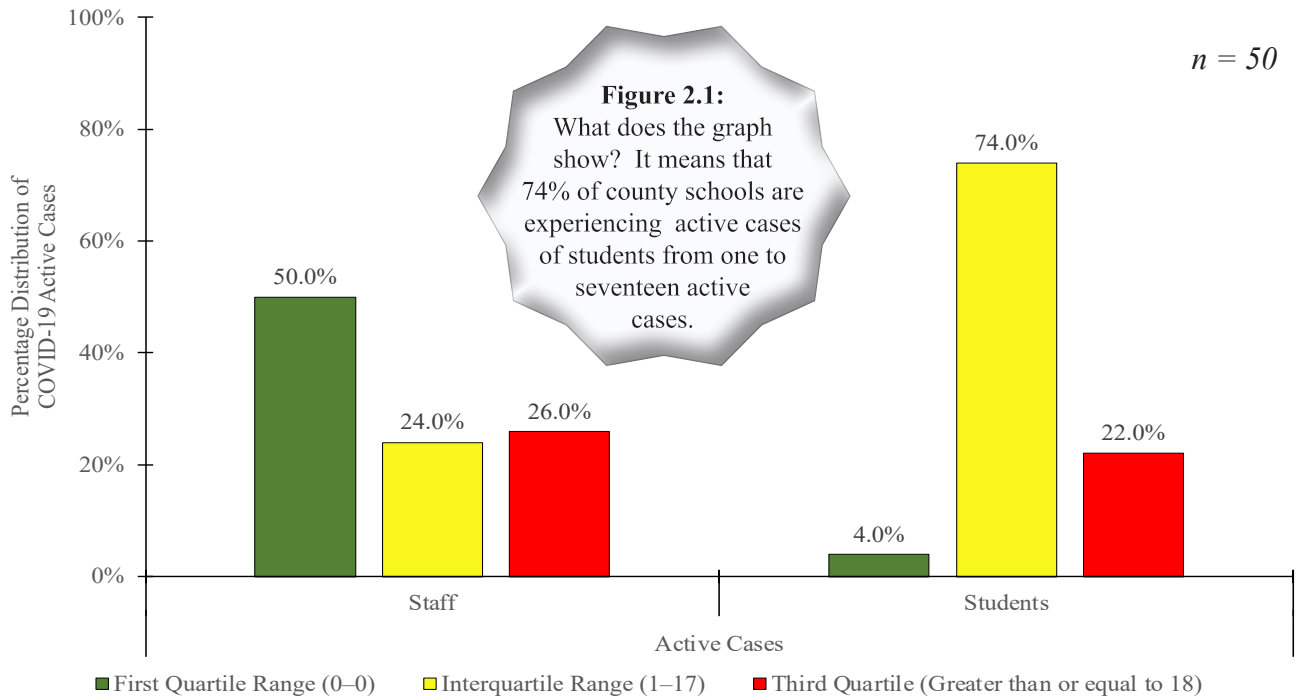


Figure 2.1 Percentage distribution of COVID-19 active cases based on number of cases per school.

Source: Horry County Schools COVID-19 Cases Dashboard

Percentage Distribution in Quarantine Relative COVID-19

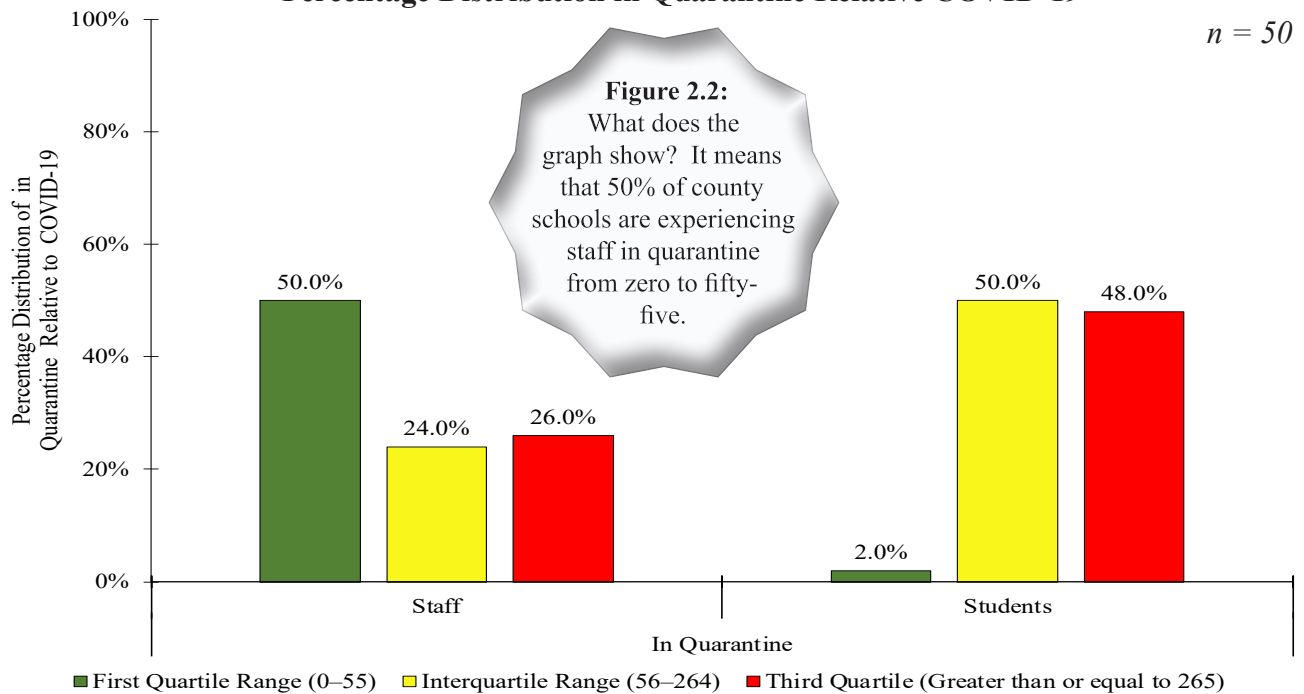


Figure 2.2 Percentage distribution of COVID-19 in quarantine based on the number in quarantine per school.

Source: Horry County Schools COVID-19 Cases Dashboard



Part III
Horry County Schools

Pareto Charts for Staff and Students
by School Relative to Active Cases
and Quarantine

3.1. Pareto Chart with Ranking of Schools with Active Cases for Staff—Highest to Lowest

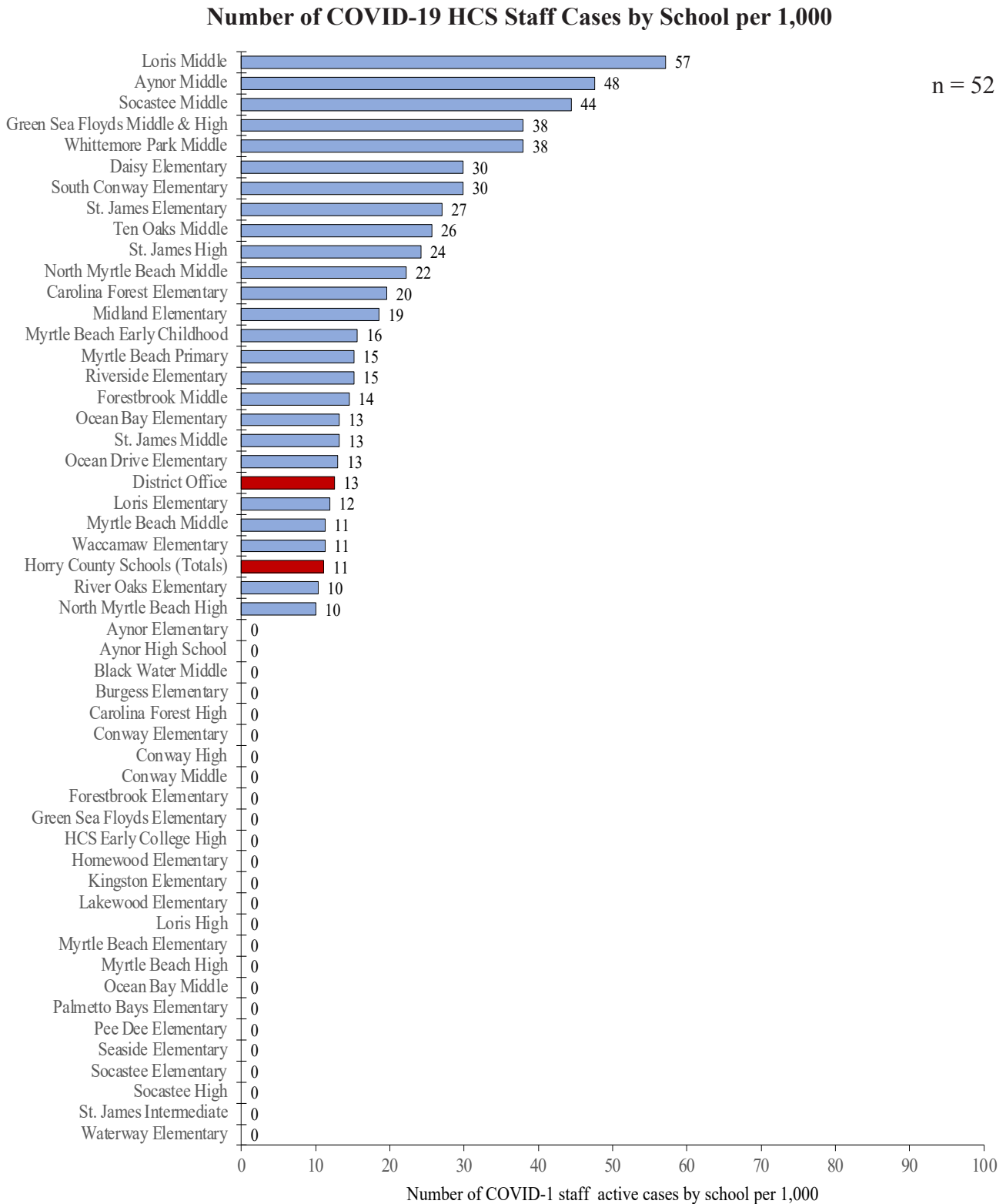


Figure 3.1 Staff active Covid-19 active cases.

Source: Horry County Schools COVID-19 Cases Dashboard



3.2. Pareto Chart with Ranking of Schools with Active Cases for Students—Highest to Lowest

Number of COVID-19 HCS Active Student Cases by School per 1,000

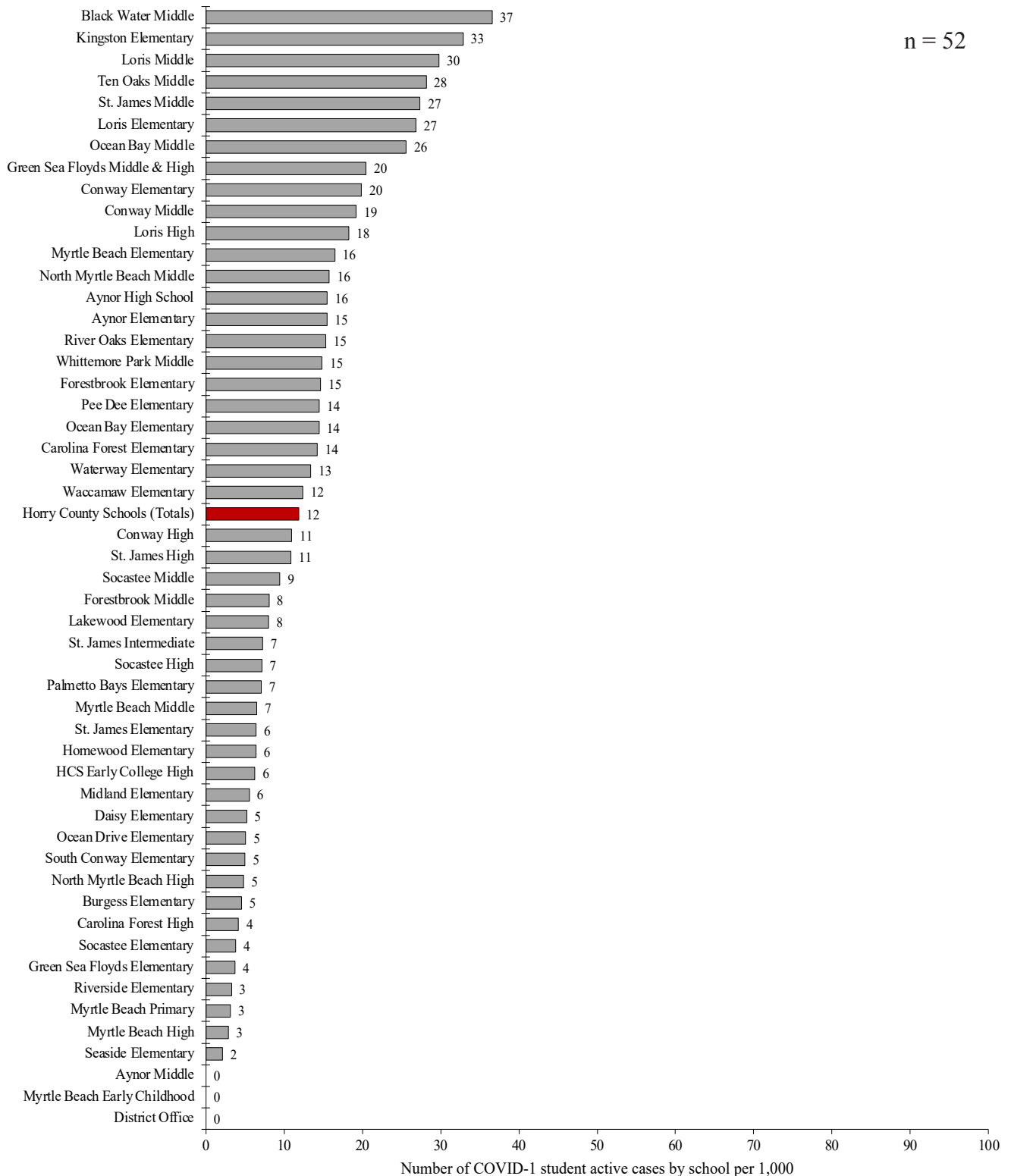


Figure 3.2 Student active Covid-19 active cases.

Source: Horry County Schools COVID-19 Cases Dashboard



3.3 Pareto Chart with Ranking of Schools with Staff in Quarantine—Highest to Lowest

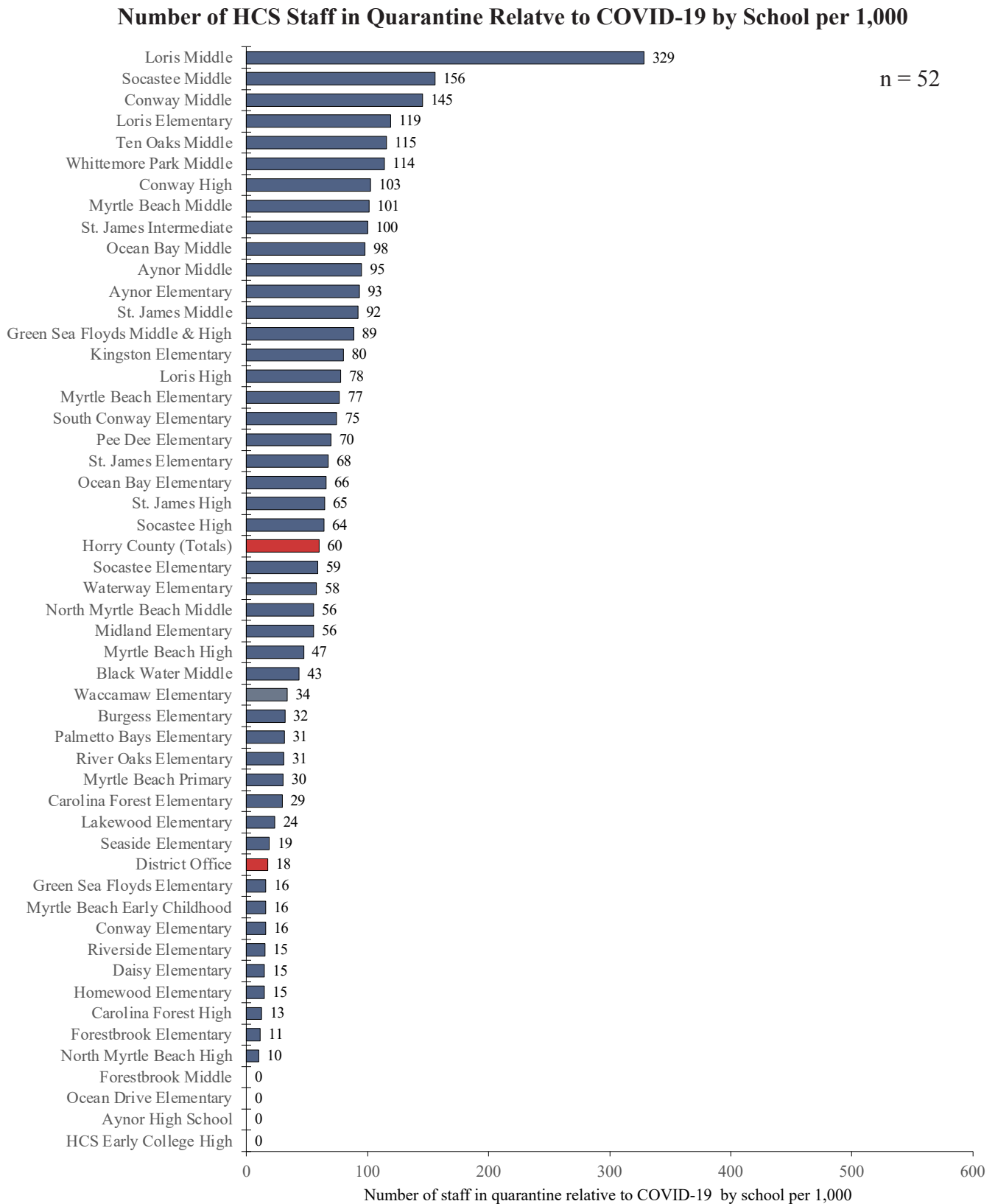


Figure 3.3 Number of staff in quarantine relative to Covid-19 by school per 1,000.

Source: Horry County Schools COVID-19 Cases Dashboard



3.4 Pareto Chart with Ranking of Schools with Students in Quarantine—Highest to Lowest

Number of HCS Students in Quarantine Relative to COVID-19 by School per 1,000

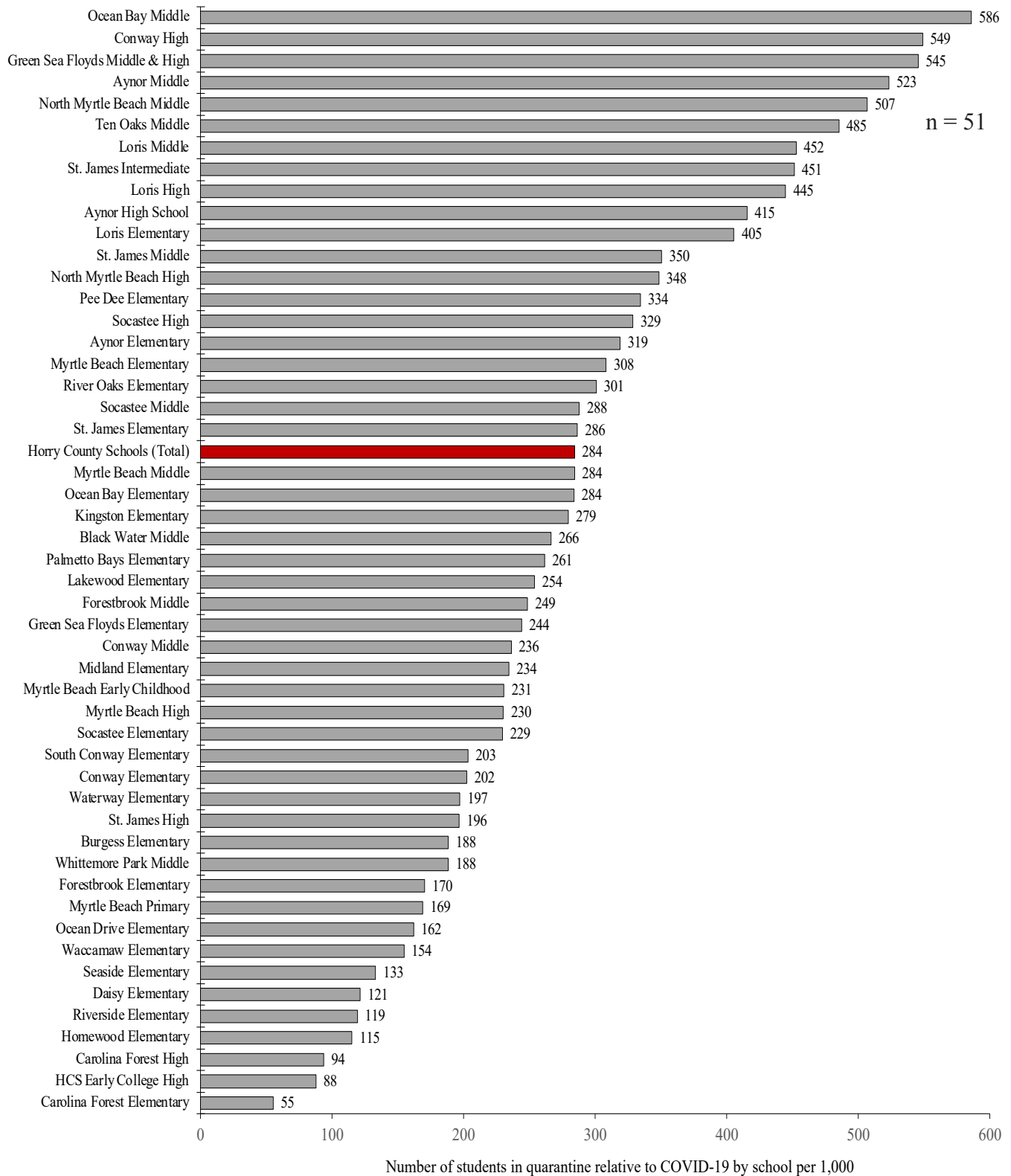


Figure 3.4 Number of students in quarantine relative to Covid-19 by school per 1,000.

Source: Horry County Schools COVID-19 Cases Dashboard



Part IV
Horry County Schools

Comparison of Staff and Students by School
Relative to Active Cases and Quarantine

4.1. Elementary School: Comparison of Staff and Students with Active Cases

Comparison of HCS Staff and Students Active Cases of COVID-19 by School per 1,000

n = 28

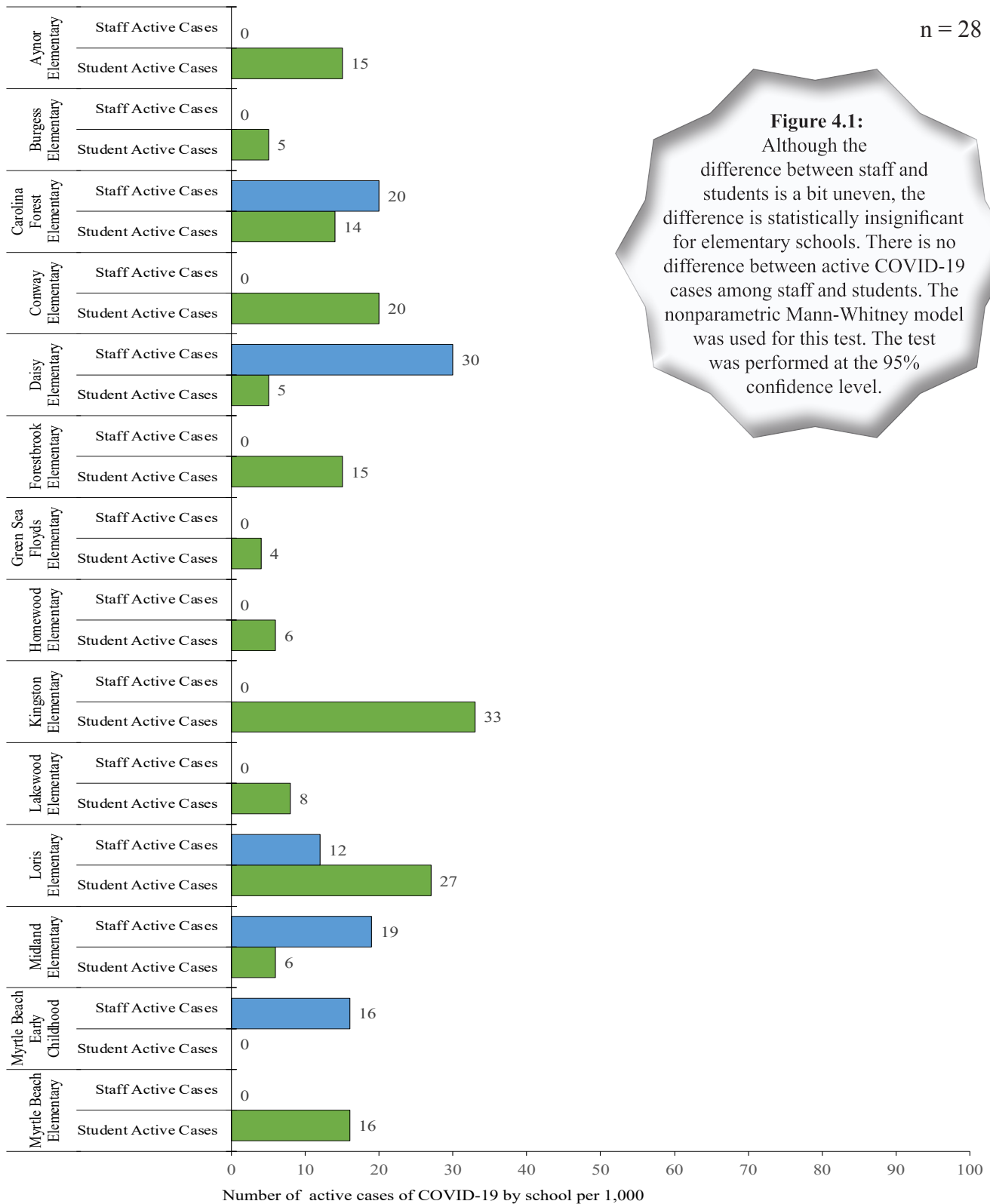


Figure 4.1 Comparison of staff and students active cases Covid-19 by school per 1,000.

Source: Horry County Schools COVID-19 Cases Dashboard



4.1. Elementary School: Comparison of Staff and Students with Active Cases

Comparison of HCS Staff and Students Active Cases of COVID-19 by School per 1,000

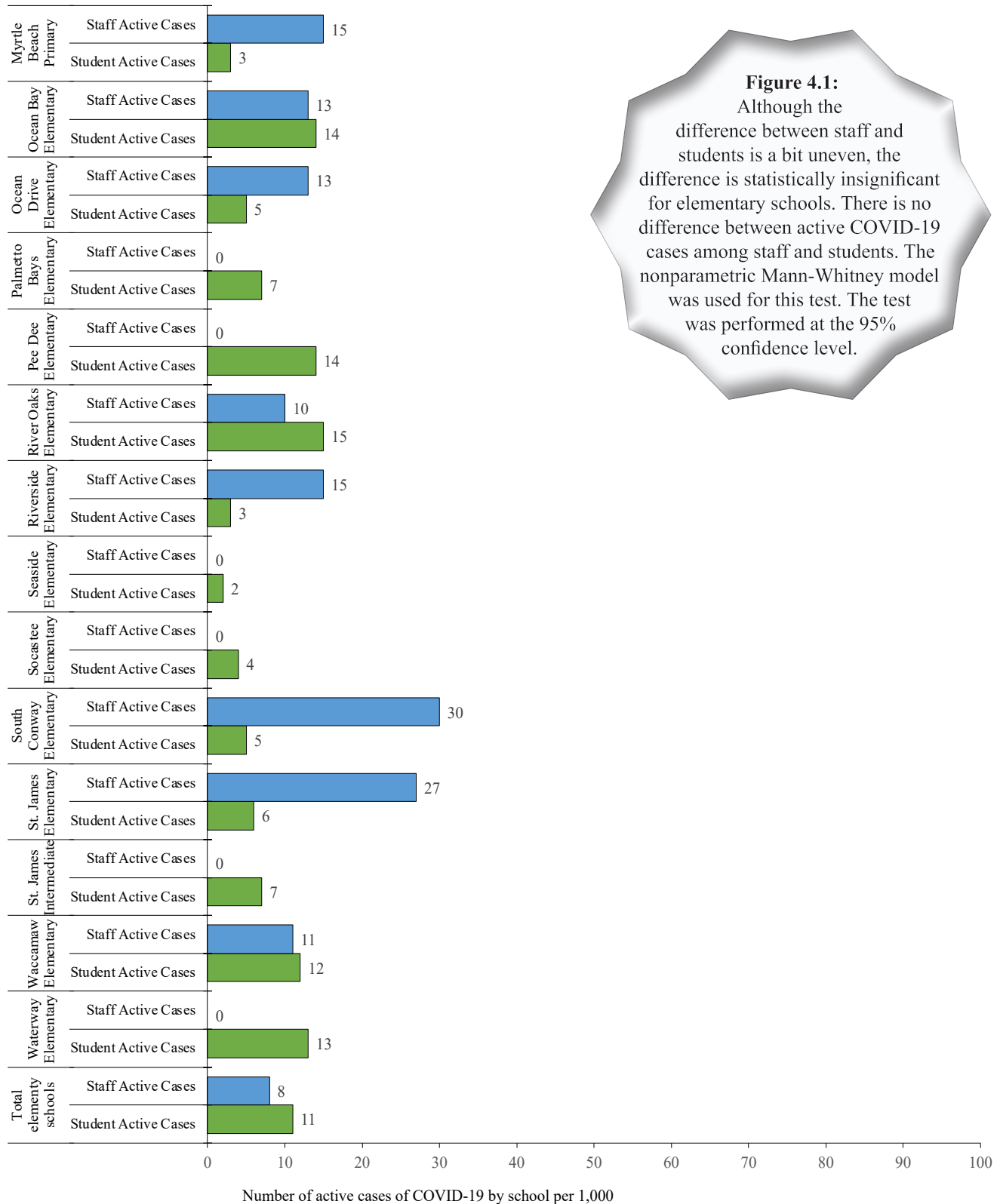


Figure 4.1 Comparison of staff and students active cases Covid-19 by school per 1,000.

Source: Horry County Schools COVID-19 Cases Dashboard



4.2 Elementary School: Comparison of Staff and Students in Quarantine, cont.

Comparison of HCS Staff and Students in Quarantine Relative to COVID-19 by School per 1,000

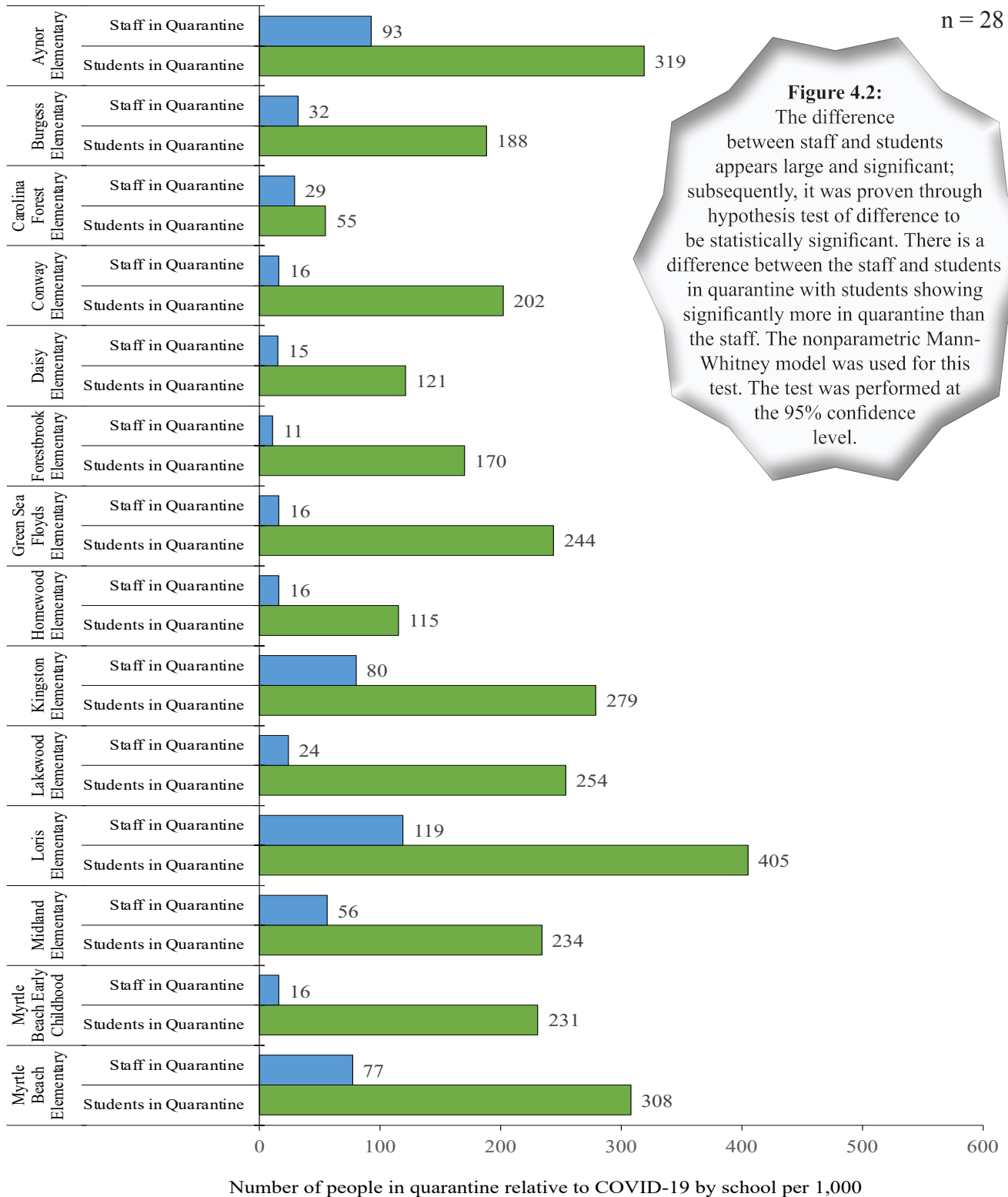


Figure 4.2 Comparison of staff and students in quarantine relative to Covid-19 by school per 1,000 (chart continued).



Source: Horry County Schools COVID-19 Cases Dashboard



4.2 Elementary School: Comparison of Staff and Students in Quarantine

Comparison of HCS Staff and Students in Quarantine Relative to COVID-19 by School per 1,000

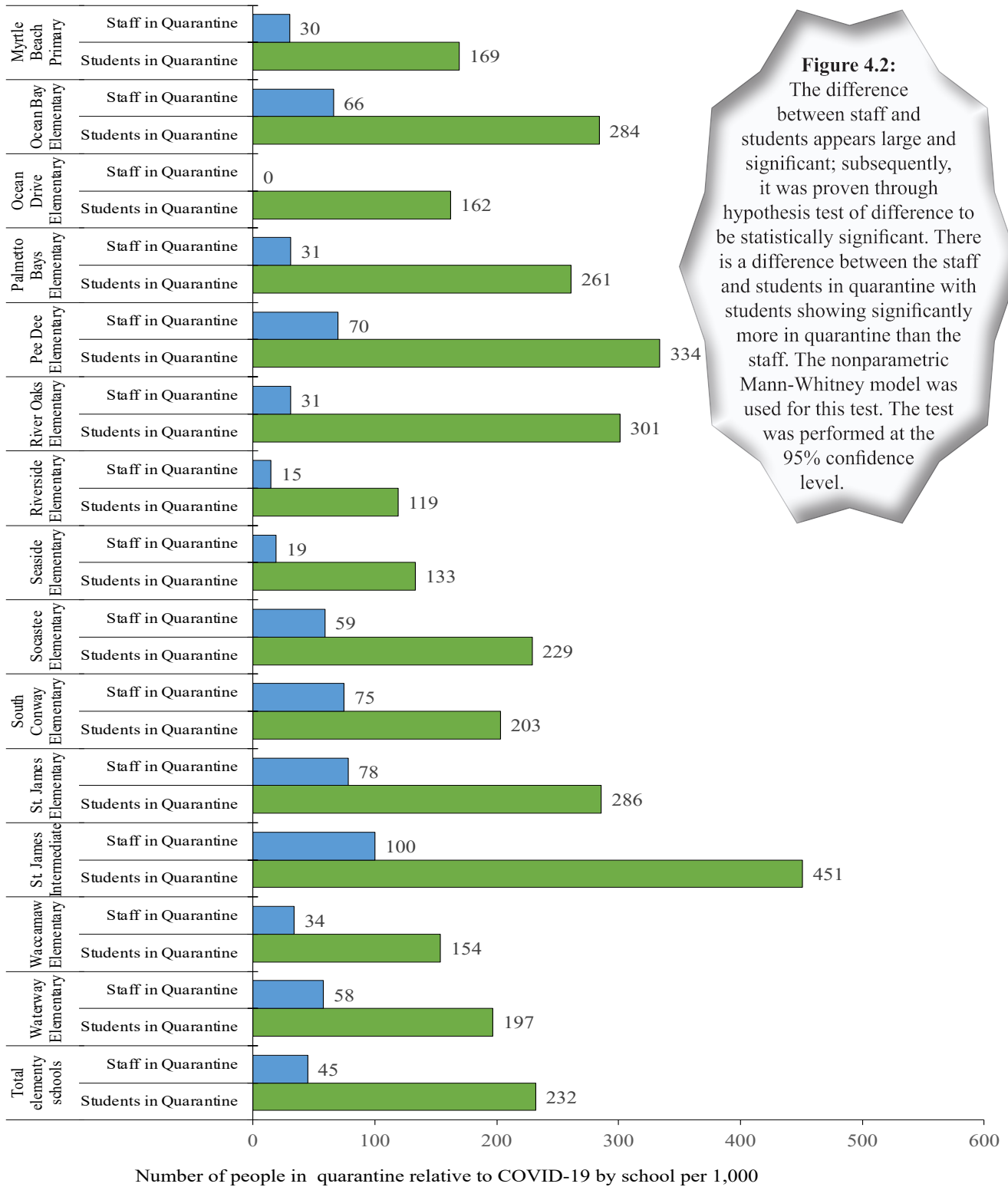


Figure 4.2. Continuation—Comparison of staff and students in quarantine relative to Covid-19 by school per 1,000.

Source: Horry County Schools COVID-19 Cases Dashboard



4.3 Middle School: Comparison of Staff and Students Active Cases

Comparison of HCS Staff and Students with Active Cases of COVID-19 by School per 1,000

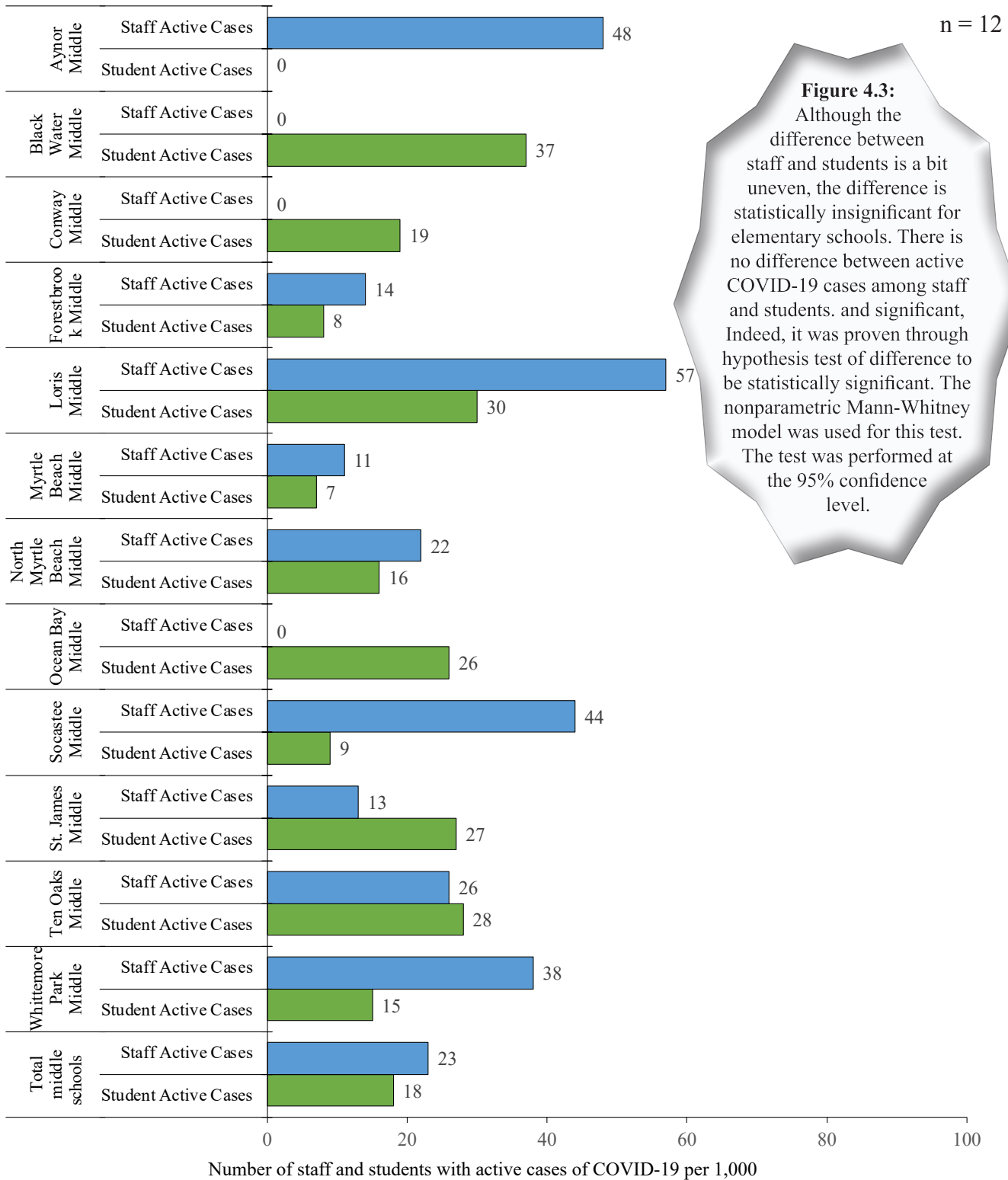


Figure 4.3 Comparison of staff and students with active cases Covid-19 by school per 1,000.

Source: Horry County Schools COVID-19 Cases Dashboard



4.4 Middle School: Comparison of Staff and Students in Quarantine

Comparison of HCS Staff and Students in Quarantine Relative to COVID-19 by School per 1,000

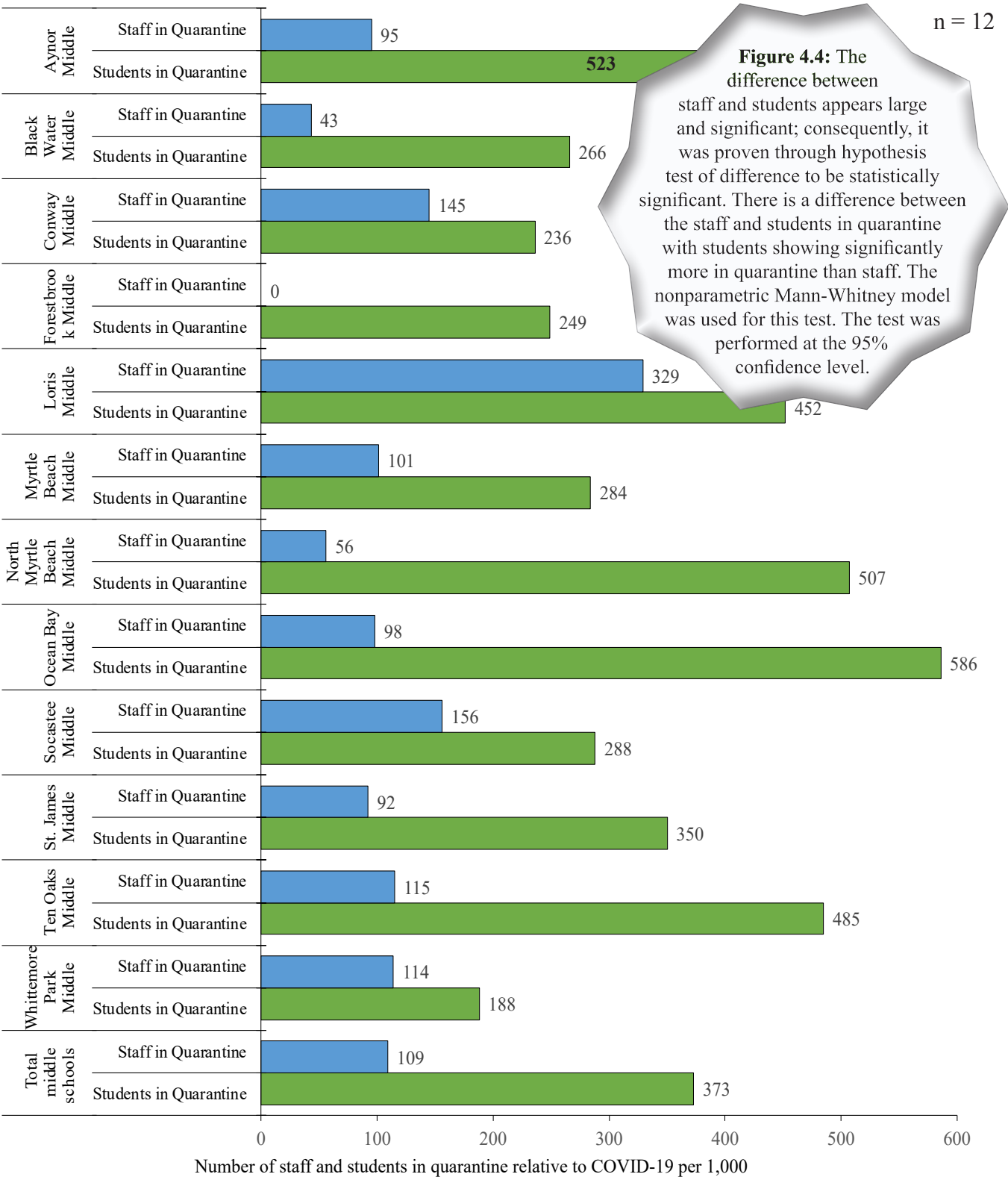


Figure 4.4 Continuation—Comparison of staff and students in quarantine relative to Covid-19 by school per 1,000.

Source: Horry County Schools COVID-19 Cases Dashboard



4.5. High School: Comparison of Staff and Students Active Cases

Comparison of HCS Staff and Students with Active Cases of COVID-19 by School per 1,000

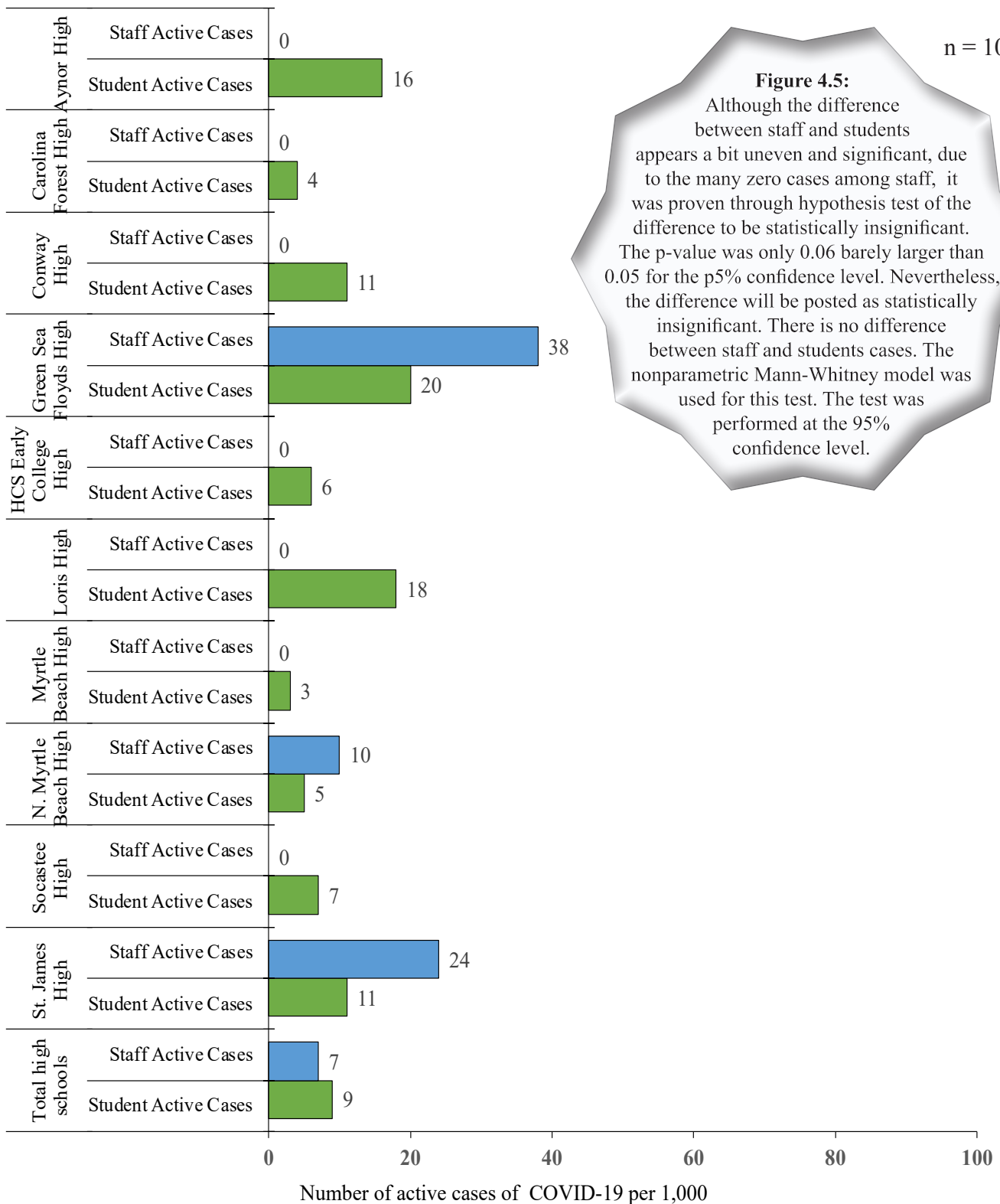


Figure 4.5 Comparison of staff and students with active cases Covid-19 by school per 1,000.

Source: Horry County Schools COVID-19 Cases Dashboard



4.6 High School: Comparison of Staff and Students in Quarantine

Comparison of HCS Staff and Students in Quarantine Relative COVID-19 by School per 1,000

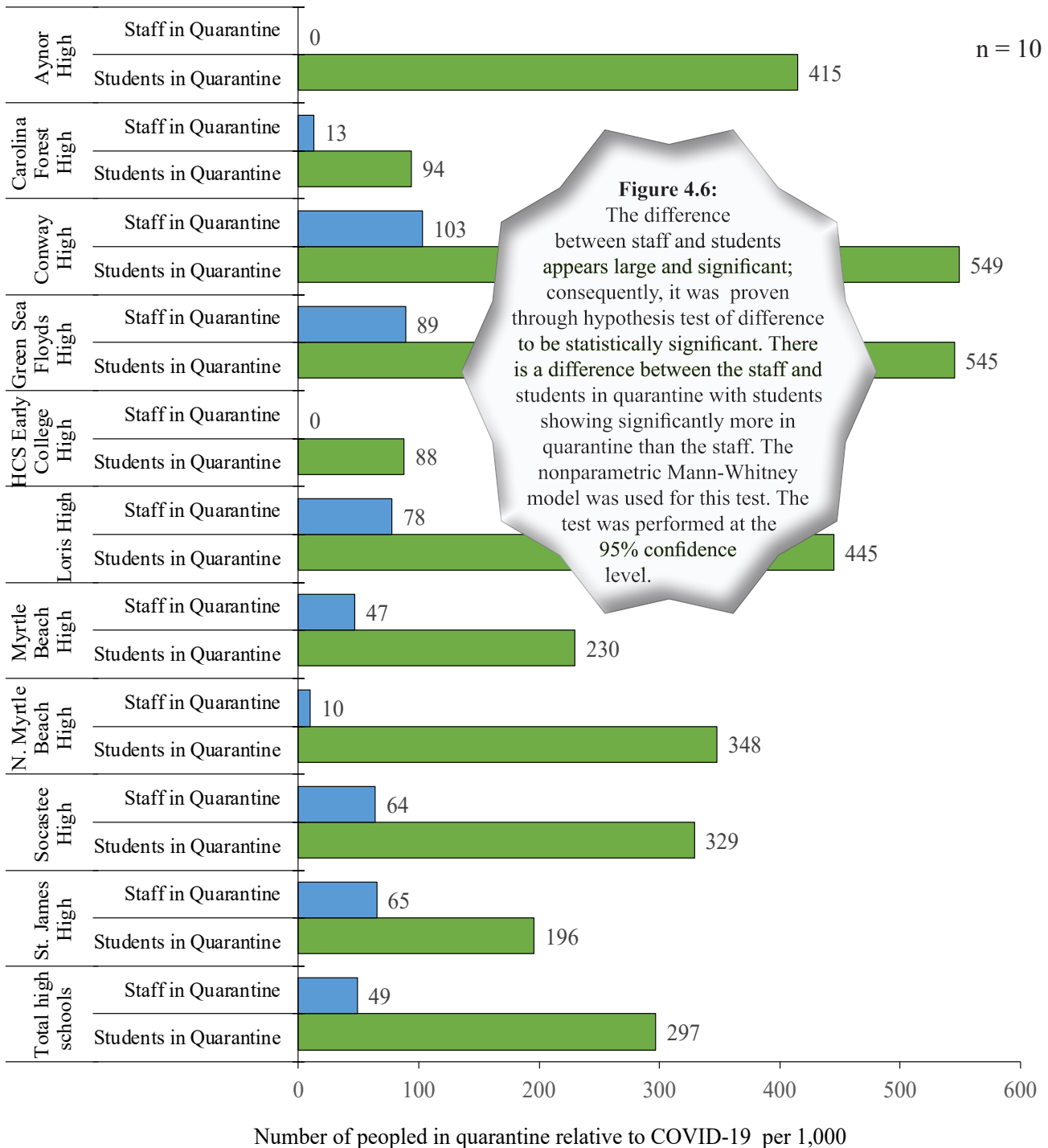


Figure 4.6 Comparison of staff and students in quarantine relative to Covid-19 by school per 1,000.

Source: Horry County Schools COVID-19 Cases Dashboard.



The Author



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David C. Wilson is an electrical engineer by training as well as an adjunct mathematics professor who is now retired after working for multinationals such as IBM and General Electric and teaching at schools such as Dutchess Community College, Quinnipiac University, and Horry Georgetown Technical College. He is a statistical consultant, family history researcher, author, and self-publisher. He earned his bachelor's degree from the [City College of New York](#) and a master's degree from [Manhattan College](#). Dave resides in Conway, South Carolina, with his wife, Beverly. They have two adult sons and six grandchildren. He is a native of South Carolina (Horry County).



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It must be demonstrated . . .



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