PCOA School Outcomes for Students Nearing the End of Their Didactic Curriculum: 2020

Prepared By

National Association of Boards of Pharmacy®

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NABP Mission Statement

NABP is the independent, international, and impartial association that assists its member boards and jurisdictions for the purpose of protecting the public health.

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PCOA School Outcomes for Students Nearing the End of Their Didactic Curriculum

Introduction

This report covers the results of the Pharmacy Curriculum Outcomes Assessment® (PCOA®) administrations for the 2020 Accreditation Council on Pharmacy Education (ACPE) reporting cohort, which consists of students testing with a free voucher as third-year (or equivalent) PharmD students in any of the 2019 and 2020 PCOA testing windows listed below.

- Window 4 2019: 8/19/2019 – 9/13/2019
- Window 5 2019: 11/11/2019 – 12/6/2019
- Window 1 2020: 1/13/2020 – 2/15/2020
- Window 2 2020: 4/6/2020 – 5/16/2020
- Window 3 2020: 6/15/2020 – 6/27/2020

This report presents descriptive statistics for PCOA test scores at the school level.

The PCOA is a 200-item examination that covers content from four primary domains: Basic Biomedical Sciences, Pharmaceutical Sciences, Social/Behavioral/Administrative Sciences, and Clinical Sciences. PCOA scores are reported on a scaled-score metric for the overall examination and for each of the four major content domains. Scaled scores account for the difficulty of the items and can be compared across administrations.

Results

The 2020 ACPE reporting cohort contained 14,110 students from 142 schools and colleges of pharmacy. Average scaled scores were computed for each school, and a summary of these mean scores at the overall exam level is provided in Table 1 (average school-level test scores). The school-level mean test scores averaged 343.4 with a standard deviation (SD) of 21.7. The median of the school-level mean test scores was slightly above the mean at 345.5.

Table 1: *PCOA 2020 Reporting Cohort Exam Summary*

		Window 4 2019	Window 5 2019	Window 1 2020	Window 2 2020	Window 3 2020	Overall
Number of students		27	417	7,973	4,188	1,505	14,110
Number of schools		1	5	75	50	20	142
Average Student-level scores	Mean	343.8	349.8	342.7	349.3	331.5	343.7
	Median	340.0	348.0	343.0	350.0	332.0	345.0
	Standard Deviation	30.1	46.9	50.2	51.6	55.6	51.4
Average school-level scores	Mean	343.8	348.8	342.3	347.4	322.1	343.4
	Median	-	356.0	344.0	349.5	330.0	345.5
	Standard Deviation	-	22.0	20.9	22.5	35.2	21.7

Note: Eight schools tested students across multiple windows.

Figure 1 provides a histogram of student-level scores for the cohort. Figure 2 provides school-level mean test scores overall and broken out by testing window for a fuller picture of the variability in school-level outcomes.

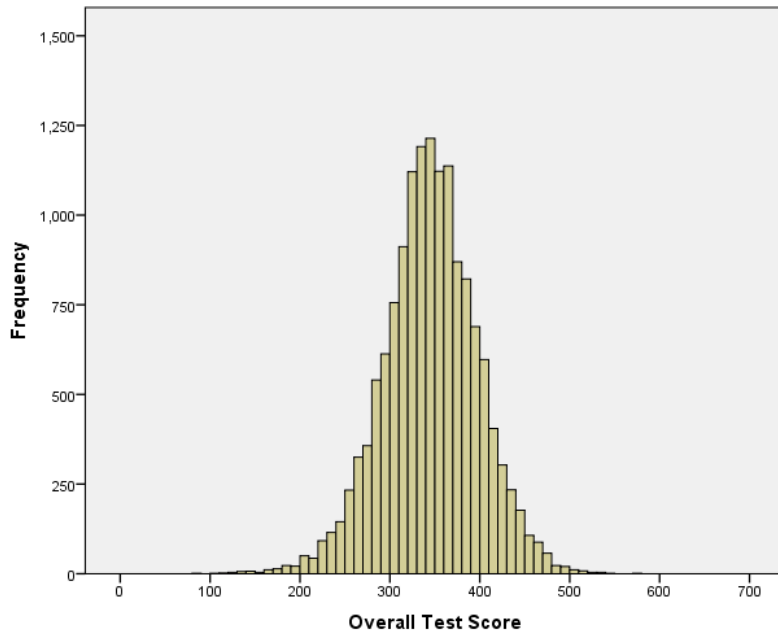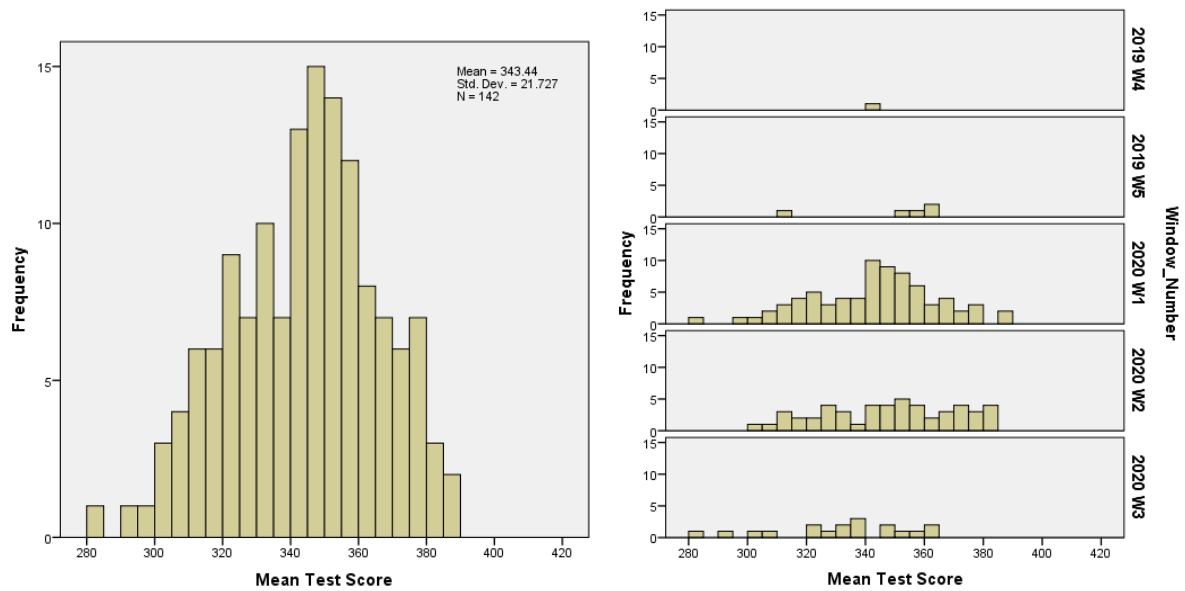Figure 1: *Distribution of Student-Level Test Scores*

Figure 2: *Distributions of School-Level Mean Test Scores Overall and by Window*

ACPE has historically (for the North American Pharmacist Licensure Examination® and the Multistate Pharmacy Jurisprudence Examination®) used a flagging criterion of 2 SD below the mean to identify scores that show a defined level of "departure" from a measure of central tendency. The scaled scores (rounded to the nearest integer) for flagging schools whose scores were at least 2 SD below the average school-level mean in the 2019-2020 cohort are indicated in Table 2. Using these scores, three schools would be flagged for performance deviation at the overall exam level. Table 3 contains average overall scores and content area scores by school. Shaded cells indicate scores that fall 2 SD below the average school-level mean. If schools were flagged in a prior year, the year(s) in which they were flagged appear in superscript after the school name.

The Appendix contains more detailed school-level results, including test score medians and SDs for each school as well as the incidence of outlier test scores. It is important to assess the impact of outlier test scores on school-level outcomes because the presence of an unusual cluster of extremely high or low scores could bias a school's PCOA outcome. School-level mean test scores were examined excluding outlying cases, and their presence did not markedly affect any school's results for the 2020 cohort. The largest negative and positive change in mean test score after outlier removal was observed for a) Palm Beach Atlantic University, whose mean score decreased by eight points (from the score reported in Table 3, after three unusually high scores were removed; and b) Rutgers University, whose mean scores increased by twelve points after thirteen unusually low scores were removed.

Table 2: *Means, SDs of School-Level Means, and Scores 2 SD Below Mean*

Test Score	Average of school means	SD of school means	Score 2 SD below mean
Overall	343.4	21.7	300
Basic Biomedical Sciences (Area 1)	347.0	25.5	296
Pharmaceutical Sciences (Area 2)	341.4	23.3	295
Social/Behavioral/Administrative Sciences (Area 3)	345.8	27.8	290
Clinical Sciences (Area 4)	345.8	23.4	299

Table 3: *Average Test Scores by School Sorted by Average Overall Score* (shaded cells indicate scores that fall below 2 SD of the mean shown in Table 2)

School	Overall	Area 1	Area 2	Area 3	Area 4	N
1	284	275	280	293	285	49
2	293	307	285	283	304	78
3	295	306	297	304	284	76
4	301	294	310	286	304	82
5	303	289	311	294	304	167
6	304	320	308	312	294	79
7	308	284	324	321	295	220
7	308	326	306	304	308	85
8	309	295	313	311	308	56
8	309	327	302	296	320	70
9	310	345	313	289	311	34
10	311	332	310	302	314	41
10	311	321	313	298	316	76
10	311	334	306	287	325	62
11	314	295	299	336	322	40
11	314	342	290	317	329	70
12	316	335	330	308	304	192
13	317	334	332	311	302	276
13	317	306	319	317	320	51
13	317	305	312	319	324	149
14	318	331	325	319	308	138
15	319	367	319	307	315	87
16	320	313	324	327	314	110
16	320	327	317	322	321	174
16	320	328	310	329	324	95
17	321	339	336	298	316	102

School	Overall	Area 1	Area 2	Area 3	Area 4	N
17	321	302	321	327	325	85
17	321	328	322	308	326	46
18	322	345	316	321	323	250
19	323	326	326	316	324	163
20	324	322	311	337	332	83
21	325	311	314	341	330	73
21	325	336	327	307	333	61
22	328	340	320	342	326	81
22	328	324	332	316	332	29
22	328	329	324	323	338	213
22	328	321	305	342	347	64
23	329	332	320	319	343	186
24	330	334	341	323	325	63
24	330	311	330	345	329	45
24	330	357	326	320	334	138
24	330	326	325	303	351	64
25	331	374	327	324	330	15
26	332	343	317	345	337	70
26	332	331	316	344	343	91
27	333	317	332	350	331	55
28	334	314	325	344	345	67
28	334	327	327	326	348	57
29	337	349	352	334	325	211
29	337	333	346	342	330	75
30	338	355	342	347	327	78
30	338	347	335	341	340	49
30	338	362	353	298	342	35
31	339	362	339	338	336	132
31	339	360	323	356	343	119
32	340	341	339	356	335	34
33	341	366	352	330	332	46
33	341	334	340	337	347	70
33	341	358	339	320	352	85
34	342	348	327	348	352	104
35	343	333	344	356	341	59
35	343	362	352	321	342	188
35	343	333	326	369	351	151
36	344	392	342	342	339	224
36	344	346	340	364	340	43
36	344	321	365	323	344	48

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School	Overall	Area 1	Area 2	Area 3	Area 4	N
36	344	360	333	352	349	134
36	344	338	346	326	353	73
37	345	360	329	365	346	51
37	345	331	350	337	350	131
37	345	338	331	343	363	139
38	346	349	338	368	346	92
38	346	364	328	347	359	50
39	347	392	350	338	339	208
39	347	336	339	376	344	73
39	347	348	357	336	347	74
40	349	347	358	369	333	111
40	349	351	353	358	343	195
40	349	341	346	367	346	232
40	349	340	343	364	349	70
40	349	344	343	359	355	84
40	349	345	340	355	358	111
40	349	346	329	370	361	79
41	350	331	352	357	351	54
41	350	330	351	355	355	109
41	350	318	344	362	361	117
41	350	387	344	321	365	66
42	351	368	345	376	344	41
42	351	354	348	359	352	114
43	352	337	331	379	365	84
44	353	332	346	369	361	94
45	354	363	348	380	345	115
45	354	349	347	385	349	106
45	354	352	364	346	351	80
45	354	348	346	355	365	127
45	354	344	346	359	365	58
45	354	355	349	343	367	73
46	355	345	359	374	347	150
46	355	339	345	373	361	86
47	356	360	350	377	354	118
47	356	340	353	375	358	123
47	356	390	345	358	359	159
47	356	339	352	359	366	112
47	356	374	345	348	370	60
48	357	354	355	373	356	109
49	358	386	352	361	357	114

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School	Overall	Area 1	Area 2	Area 3	Area 4	N
50	359	393	367	352	353	89
50	359	381	358	358	358	50
50	359	358	357	351	367	83
51	360	368	352	373	362	146
51	360	384	354	346	369	42
51	360	369	352	358	369	77
51	360	375	347	362	369	81
52	362	394	370	365	347	137
52	362	358	354	371	370	79
53	363	355	365	363	365	52
54	364	343	375	334	378	38
55	365	367	365	391	355	265
55	365	374	356	377	367	115
55	365	378	362	365	368	42
55	365	358	358	378	369	50
56	366	376	374	356	364	113
57	368	377	371	361	371	166
58	369	375	375	377	360	138
59	370	366	373	388	362	123
60	371	354	358	382	386	128
61	372	376	377	370	371	89
61	372	373	379	367	372	160
62	373	372	372	392	370	123
62	373	365	351	385	397	35
63	375	361	380	386	373	52
63	375	375	383	370	374	119
64	377	385	380	379	375	84
64	377	397	378	364	382	67
64	377	362	375	381	384	61
65	378	360	392	372	377	96
66	379	381	372	381	389	152
67	380	387	378	401	372	143
68	381	378	384	389	379	150
69	383	358	376	391	396	48
70	385	403	394	388	373	78
70	385	382	387	367	398	51

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The standard error of the school means can also be accounted for when evaluating the relative performance of schools on the PCOA. Figure 3 provides a plot of the 95% confidence bands for the overall test scores by school. The vertical reference lines indicate the mean (center line) and scores 2 SD below (left) and above (right) the mean. The confidence bands indicate the degree of sampling error in each school's mean test score. The performance for two schools should be considered similar if their confidence bands overlap. Similarly, a school should be considered as performing similar to a criterion (ie, 2 SD below the mean, average performance) if its confidence band clearly contains the criterion score. It can be seen from Figure 3 that three of the four schools flagged for performance deviation show performance that is significantly lower than 2 SD below the mean.

Figure 3: *95% Confidence Bands for Overall Test Score*

Note: The three vertical lines indicate (from left to right): mean – 2 SD, mean (from Table 2), and mean + 2 SD.
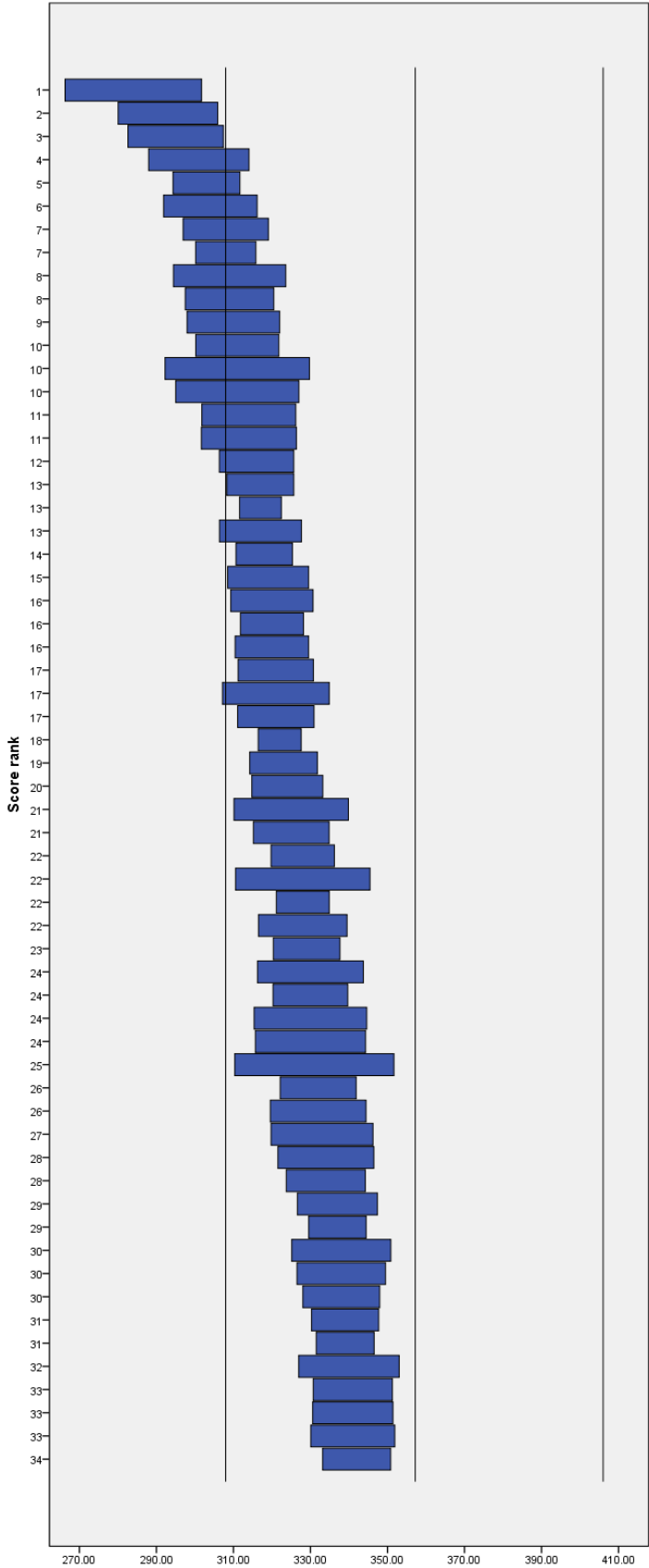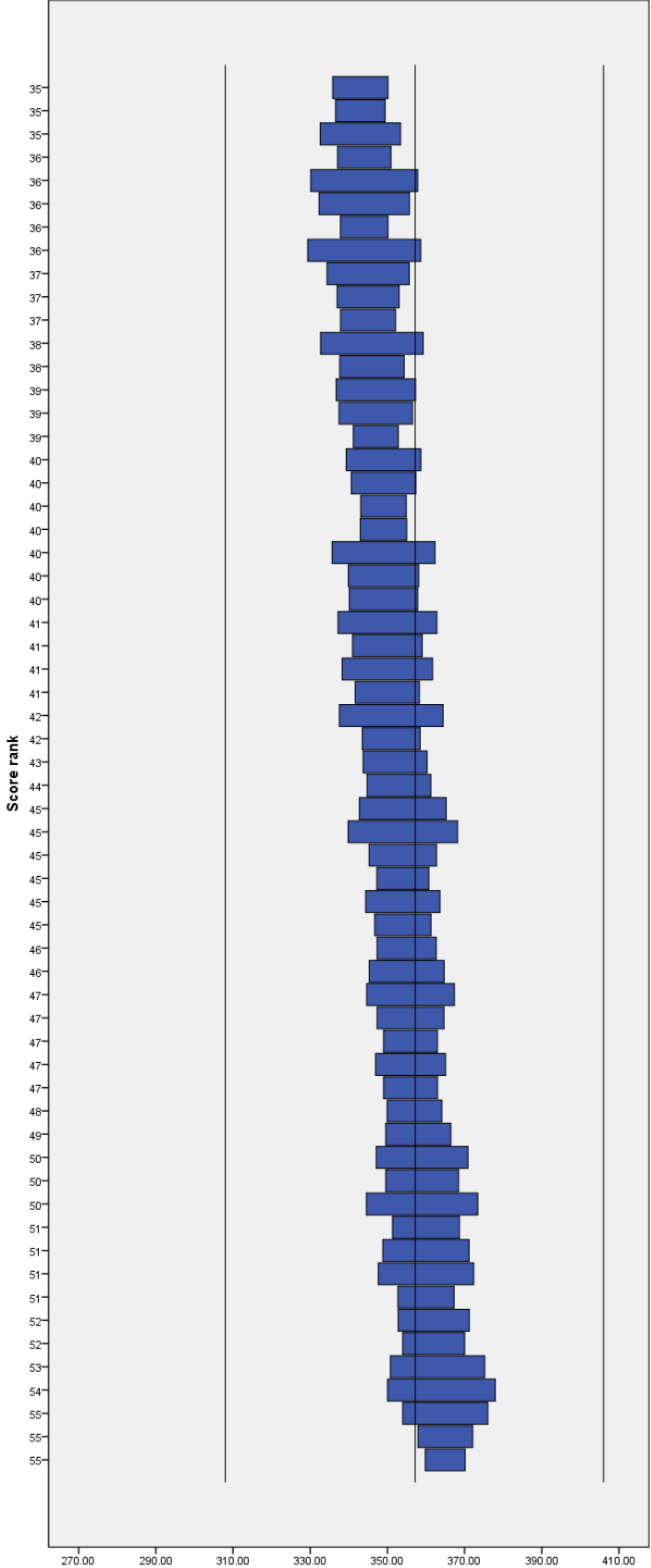
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Figure 3, continued: *95% Confidence Bands for Overall Test Score*

Note: The three vertical lines indicate (from left to right): mean – 2 SD, mean (from Table 2), and mean + 2 SD.

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Figure 3, continued: *95% Confidence Bands for Overall Test Score*

Note: The three vertical lines indicate (from left to right): mean – 2 SD, mean (from Table 2), and mean + 2 SD.
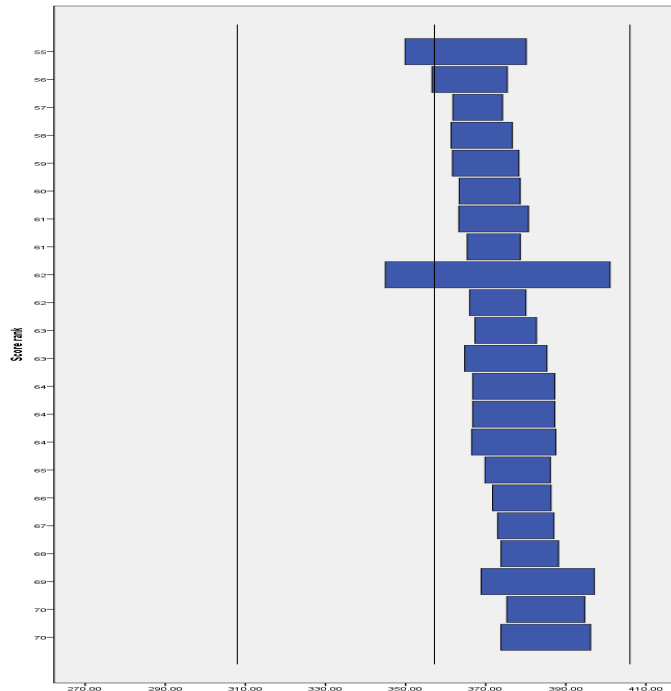
Appendix

Microsoft Excel file containing more detailed school-level results: ACPE 2019 PCOA Report - Appendix.xlsx

This file contains the following fields:

Field	Field definition
School Code	Numeric identification code assigned to the school
School Name	
N	Number of students who tested
Mean Score	Mean scaled score (overall and for each of the four content areas)
Standard Deviation	SD of scaled scores (overall and for each of the four content areas)
Median Score	Median scaled score (overall and for each of the four content areas)
Overall Trimmed Mean	Overall mean scaled score with outliers removed
Overall Trimmed SD	Overall scaled score SD with outliers removed
Number of Outliers: Total	Total number of outlying overall test scores
Number of Outliers: Low	Number of outlying low overall test scores
Number of Outliers: High	Number of outlying high overall test scores
Definition of outliers: The mean and SD of each school's test scores were used to identify its outlying scores. Outlying scores were defined as those that were more than 2 SDs from the school's mean.	