

Analysis of Essential Programs and Services Components:  
**Staff Ratios**

Report to the  
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**Essential Programs and Services Funding Model Component Review:  
Staff Ratios**

<b>Background .....</b>	<b>1</b>	Amy 3 Delet
<b>Approach to Component Review .....</b>	<b>3</b>	
<b>Findings.....</b>	<b>4</b>	
<b>Staff Ratios by Grade Level .....</b>	<b>4</b>	
<b>Variation in Ratios.....</b>	<b>7</b>	
<b>Declining Ratios .....</b>	<b>8</b>	
<b>Comparison By School Characteristics.....</b>	<b>9</b>	
<b>School Size.....</b>	<b>9</b>	
<b>Poverty Level.....</b>	<b>9</b>	
<b>Academic Performance.....</b>	<b>13</b>	
<b>Rural Schools.....</b>	<b>16</b>	Amy 3 Dele
<b>Further Data Limitations .....</b>	<b>20</b>	Amy 3 Dele
<b>Discussion &amp; Policy Implications .....</b>	<b>21</b>	Amy 3 Delet
<b>General .....</b>	<b>21</b>	Amy 3 Dele
<b>Teachers .....</b>	<b>22</b>	Amy 3 Dele
<b>Educational Technicians .....</b>	<b>23</b>	Amy 3 Dele
<b>Guidance .....</b>	<b>24</b>	Amy 3 Dele
<b>Health .....</b>	<b>25</b>	Amy 3 Dele
<b>Librarian/Media Specialist &amp; Ed Techs for Library/Media.....</b>	<b>26</b>	Amy 3 Dele
<b>Clerical.....</b>	<b>27</b>	Amy 3 Dele
<b>School administration.....</b>	<b>28</b>	Amy 3 Dele
<b>Summary.....</b>	<b>28</b>	Amy 3 Dele
<b>References.....</b>	<b>29</b>	Amy 3 Dele
<b>Appendix A: Instructional Staff ratios including Title I positions.....</b>	<b>30</b>	Amy 3 Dele Amy 3 Dele Amy 3 Delet Amy 3 Delet Amy 3 Delet

## **Essential Programs and Services Funding Model Component Review: Staff Ratios**

### **Background**

Staffing ratios are a key component of the Essential Programs and Services (EPS) funding model. When multiplied by student enrollment, they determine a large proportion of a district's total funding allocation. The EPS formula establishes the number of full-time equivalent (FTE) staff necessary per student to ensure all students have an opportunity to achieve the Maine Learning Results. This includes staff positions for several school-level functions deemed essential to student learning and school management, including teachers, guidance counselors, librarians, educational technicians ("ed techs"), library/media technicians, school health professionals (nurses), administrative assistants, and school administrators (principals and assistant principals). The ratios vary by grade level. Until recently, ratios were provided for three grade levels: preK-5, 6 to 8, and 9 to 12. Beginning in FY2019, a separate teacher ratio was created for grades pre-K and K.

When the EPS model was initially developed, staff ratios were established after review of several data sources. Empirical data from available staff and student enrollment information were used to calculate existing student-to-staff ratios as a first step. Because some types of administrative data were limited, a survey was also conducted to collect additional data from school districts to fill in gaps. However, the goal of the EPS "adequacy-based" funding model was to provide sufficient staff to help schools provide a comprehensive education as proscribed by the Maine Learning Results, and merely looking at existing staffing patterns was not necessarily an indicator of adequacy. Some schools may have had more than enough staff, while others were understaffed. Therefore, the model development process also consulted existing research literature to inform the optimal proportions of various types of staff positions. For several staff position types, there was no published research to guide policymakers' decisions. Thus as an additional step, the model development consulted professional experts, including Maine practitioners as well as national professional organizations, to establish appropriate ratios of students to staff.

The teacher and educational technician ratios were modified for FY2019 as part of a related policy change to remove Title I-funded staff and thus redefine those ratios as including only EPS-funded positions. In this change, a separate (and lower) ratio of 15:1 was created for grades PreK and K, the ratio for grades 1 to 5 remained the same at 17:1, the ratio for grades 6-8 was raised from 16:1 to 17:1, and the ratio for grades 9-12 was raised from 15:1 to 16:1. The educational technician ratios were also increased to proportions equal to those reported in the 2015 ratio review: 114:1 for grades PreK-8, 312:1 for grades 6-8, and 316:1 for grades 9-12. All other staff ratios have remained the same since the inception of the model.

It is important to note that the staff ratios are **not the only source of funding** for staff in the EPS model. For example, the model provides an additional weight of 0.10 for each pupil in grades PreK, K, 1, or 2. The funds are “targeted” in that they must be used to support education in those grades, but there are no further restrictions; school districts can choose to use these supplemental resources to pay for additional staff. Conceptually, a school with only grades preK through 2 would have 100% of its students eligible for the early childhood student weight, and would thus have an additional 10% of its base funding amount available to hire additional teachers – an effective ratio of 13.5:1 for grades PreK-K and 15.3 in grades 1-2 if all the supplemental funds were used for that purpose. Elementary schools with grades K-5 would only be able to spend the 0.10 student weight amount on grades K to 2, but because there is no restriction on the *base* funding amount, they can redirect a portion of the base funding from the earlier grades to grades 3-5. Thus the 0.10 early elementary weight can indirectly result in lower ratios in other grades. The EPS formula also has an additional student weight of 0.20 for each economically disadvantaged student, 0.15 of which is non-targeted and could be used for paying for additional teachers in any grade. (The remaining .05 weight has targeted restrictions that may or may not include staff; each district must have an approved plan for the funds.) This makes it difficult to use the actual staff ratios found in Maine schools to directly inform the ratios in the EPS model.

## **Approach to Component Review**

As dictated by Maine statute, the components of the EPS funding formula are subject to review every three years. Staff ratios were last analyzed in 2015 using 2013-14 data. In this report, using 2016-17 and 2017-18 data, actual ratios for EPS positions were examined by school grade configuration. Ratios were also examined by school size, poverty level and proficiency level. Only positions that are funded via the staff ratios in the EPS formula are included in the calculations. Staff funded through other EPS formula components—for example, personnel dedicated to special education, gifted and talented education, career and technical education, or district-wide administrative services—are excluded. Schools also use federal funds to hire staff, particularly to support special education and Title I programs. Appendix A contains analysis of how these federal funds change the overall staffing patterns. Staff ratios also do not include contracted consultants or specialists that are not regular payroll positions, and thus are not reported in annual staff data collection.

The sample of schools used to calculate student-to-staff ratios included only regular public schools; Maine Indian Education, state operated, CTE, unorganized territory and charter schools were excluded, as were private town academies. Also excluded were island schools and other schools designated as “small and isolated” in a separate element of the EPS model. The analysis included 493 schools in 2016-17 and 489 schools in 2017-18. Schools with grade configurations that do not fit the EPS prototypical model of elementary, middle, or high schools (such as K-8 or K-12 schools) are included in overall statewide numbers, but not in the grade-level categories.

The current component review is based on FY2017 data, and as such it does not address the separate ratio for pre-K and K that was introduced for FY2019. Preliminary analysis of existing data suggests that calculation of separate ratios for PK-K and grades 1-5 will be challenging in the future, because many elementary teacher positions involve more than one grade level. This challenge will be further described and explored in a future report. Also, as of FY2018, Title I classroom teachers are no longer considered part of the EPS teacher ratios, and thus they are also excluded from calculations. Prior component reviews reported teacher ratios both with and without Title I teachers included. Where ratios from prior reports are provided for historical context, teacher ratios without Title I teachers are given for comparability.

## Findings

### Staff Ratios by Grade Level

Tables 1 and 2 display overall ratios by school grade configuration for the eight EPS staff position categories. These tables summarize the most recent data analysis, and also include the analogous ratios allocated in the EPS formula for comparison. As noted in the introduction, the EPS staff ratios are not the only source of funding for staff. Therefore, actual ratios are anticipated to be at or below the EPS ratios.

Table 1: Teacher and Educational Technician ratios, EPS and FY2017*							
	Elementary (Grades p/K-5)		Middle Schools (Grades 6-8)		High Schools (Grades 9-12)		Total FTE staff statewide
	EPS	FY17	EPS	FY17	EPS	FY17	FY17
Teacher ratio	17	14.9	17	14.2	16	14.6	11,461.1
Ed Tech ratio	114	116	312	320	316	317	999.9

Notes: Schools without any staff in a position category (i.e., zero FTE) are included in overall ratios. Ed Tech ratios are based on 2017-18 data.

Table 2: Non-Instructional Staff ratios, EPS and FY2017							
	Elementary (Grades p/K-5)		Middle Schools (Grades 6-8)		High Schools (Grades 9-12)		Total FTE staff statewide
	EPS	FY17	EPS	FY17	EPS	FY17	FY17
Guidance	350	359	350	251	250	187	626.3
Librarian/media spec.	800	1,634	800	732	800	726	166.0
Library/media ed tech	500	470	500	848	500	800	277.7
Health	800	583	800	656	800	793	261.9
Clerical	200	202	200	187	200	138	967.7
School Admin	305	263	305	241	315	251	666.9

Note: Schools without any staff in a position category (i.e., zero FTE) are included in overall ratios.

These tables reveal several key findings. Table 1 shows that student-to-teacher ratios in 2016-17 were below the EPS level at all grade levels, while educational technician ratios in 2017-18 are on par with EPS. Table 2 demonstrates that the student-to-staff ratios for all other staff are generally lower than EPS, with the exception of elementary guidance, elementary librarians, elementary clerical staff, and secondary library / media educational technicians. In other words, schools are employing more staff than provided by the EPS ratios; they are supplementing with funds from other parts of the EPS formula, or with additional local funds above the EPS model allocation.

This is a substantial shift from the context at the time the EPS model was developed. As described above, the approach at the time was to increase resources available to schools in order to ensure they had adequate staff to help students achieve the Maine Learning Results. Accordingly, the initial staff ratios were established below actual empirical levels—i.e. providing more staffing to schools—for teachers, educational technicians, library personnel, and health personnel. School administrator and clerical ratios were set at about the levels in place at the time, though additional resources for instructional leadership to supplement support for teachers were added in another part of the model.

Table 3 below is an expanded depiction that includes the percent of schools without each type of EPS staff position, school-level ratio ranges, and the percent of schools with ratios below those provided in the EPS funding model, to provide important context for interpreting the ratios.

Table 3: FY2017 Staff ratios, school-level range of ratios, % of schools without staff and % with ratios below EPS ratio			
<i>Number of schools 2016-17</i>	255	82	81
<i>Total enrollment 2016-17</i>	71,102	30,882	44,167
	<b>Elementary Schools</b>	<b>Middle Schools</b>	<b>High Schools</b>
<b>Teacher ratio</b>	14.9	14.2	14.6
% schools with no Teachers	0%	0%	0%
Median (Range) of School ratios	14.6 (10-30)	14.0 (10-19)	14.5 (10-18)
% schools below EPS ratio	85%	94%	78%
<b>Educational Tech (FY2018)</b>	116.0	319.8	316.6
% schools with no Ed Tech	18%	36%	16%
Median (Range) of School ratios	101 (22-1,280)	277 (43-854)	31 (99-1,930)
% schools below EPS ratio	56%	54%	50%
<b>School Administrator ratio</b>	262.5	240.7	250.8
% schools with no Admin	2%	1%	0%
Median (Range) of School Ratios	250 (72-782)	244 (123-633)	245 (99-397)
% schools below EPS ratio	71%	84%	83%
<b>Guidance ratio</b>	359.3	250.9	187.0
% schools with no Guidance	14%	2%	4%
Median (Range) of School Ratios	323 (79-1,480)	264 (102-1,060)	182 (59-586)
% schools below EPS ratio	58%	86%	81%
<b>Health Staff ratio</b>	583.3	655.7	792.9
% schools with no Nurse	36%	32%	23%
Median (Range) of School Ratios	418 (150-1,215)	514 (121-1,250)	659 (235-1,994)
% schools below EPS ratio	93%	96%	74%
<b>Librarian/media Specialist</b>	1,634.5	731.8	726.4
% schools w/o Librarian	70%	35%	19%
Median (Range) of School Ratios	542 (98-7,120)	512 (190-7,320)	619 (237-1,994)
% schools below EPS ratio	60%	81%	74%
<b>Library/media Ed Tech ratio</b>	470.2	848.4	800.1
% schools w/o Lib/Media Tech	29%	50%	35%
Median (Range) of School Ratios	337 (86-1,092)	392 (106-1,378)	555 (99-1,670)
% schools below EPS ratio	83%	61%	41%
<b>Clerical ratio</b>	201.8	186.7	137.9
% schools w/o Clerical	1%	1%	0%
Median (Range) of School Ratios	193 (23-469)	181 (85-397)	139 (50-440)
% schools below EPS ratio	54%	60%	93%

Note: Teacher and Ed tech ratios do not include Title I-funded staff. There were 250 elementary (enrollment: 70,162), 78 middle (enrollment: 30,449), and 81 high schools (enrollment: 44, 131) and a total of 489 schools, atypically grade-configured included (enrollment: 167,638) in 2017-18, the year of data used for educational technician calculations. Overall ratios include schools without staff (i.e., zero FTE). Ratio ranges, medians, and percent of schools below the EPS ratio are at the school level and include only schools with relevant staff positions.



## Variation in Ratios

The additional descriptions in Table 3 illustrate several important factors. First, ratios varied substantially from school to school. There were wide ranges in schools' student-to-staff ratios across all EPS positions and at each grade span. At one end of the spectrum, some schools had zero staff in some of the eight EPS position categories. For example, 36% of elementary schools, 32% of middle schools and 26% of high schools did not have school nurses; 70% of elementary schools did not have librarian/media specialist positions (compared to 35% of middle schools and 19% of high schools); and 14% of elementary schools did not have guidance staff positions compared to 2% of middle schools and 4% of high schools. During the 2017-18 school year, there were 7,103 educational technician positions statewide, but only 26% were EPS positions paid with state or local funds. Once funding source was considered, 6% of elementary schools, 27% of middle schools and 15% of high schools did not have any state or locally funded ed tech staff.

At the other end of the ranges, some schools operated with as few as 9 or 10 students per full-time teacher, 20 students per ed tech, and 72 students per full-time administrator. With only a few exceptions (ed techs and library/media ed techs for middle and high schools, and guidance, librarians/media specialists and clerical support for elementary schools), a strong majority of schools had actual staff ratios below those in the EPS funding model. The EPS staff ratios are lower than actual staffing patterns in only a few selected areas. Statewide ratios calculated using all schools including those without staff positions (i.e., zero FTE), indicate librarian/media specialist ratios for elementary schools and library/media educational technicians for middle and high schools are higher than the EPS funding model provides, and elementary clerical ratios are on par with EPS.

In particular, teacher ratios were below the EPS funding model ratio across all grade levels. The teacher ratio was below the EPS funding ratio by 2.1 students per full-time teacher for elementary schools, 2.8 students per teacher for middle schools, and 1.4 students per full-time teacher for high schools. School districts are using other resources to fund additional teachers, drawing either from other allocations within the EPS formula (such as the disadvantaged student weight) or from additional revenue raised locally.

## Declining Ratios

Table 4 displays the data used to calculate student-to-teacher ratios by grade span for school years 2013-14 and 2016-17, including schools with non-prototypical grade configurations. Statewide teacher ratios declined somewhat (i.e., there were fewer students per teacher FTE) across all school types in this time interval. Overall, in 2016-17 there were 0.7 fewer students per teacher FTE (15.1 versus 14.4) compared to 2013-14. Teacher ratios declined the most for elementary and middle schools, with ratios down by 0.7 to 0.9 students per teacher FTE, respectively, compared to 0.5 fewer students per teacher FTE for high schools.

Teacher ratios appear to have decreased between 2013-14 and 2016-17 because student enrollments declined while teacher FTE increased. Statewide student enrollment declined by about 1.3% between the school years 2013-14 and 2016-17 (174,816 to 172,542) while non-Title I teacher FTE *increased* by 3.4% (11,575.0 to 11,972.4).

Table 4: Student-Teacher ratios by grade span for 2013-14 and 2016-17							
	K-5/6	6-8/7-8	9-12	K-8	K-12	Other	All
<b>2013-14</b>							
Number of schools	270	82	89	88	10	26	565
Total enrollment	71,900	31,122	45,978	16,174	1,993	7,649	174,816
FTE Teachers	4,515	2,063	3,065	1,213	180	540	11,575
<b>Teacher Ratio</b>	<b>15.9</b>	<b>15.1</b>	<b>15.0</b>	<b>13.3</b>	<b>11.1</b>	<b>14.2</b>	<b>15.1</b>
<b>2016-17</b>							
Number of schools	271	83	89	75	10	31	559
Total enrollment	71,919	30,932	45,064	14,867	1,835	7,925	172,542
FTE Teachers	4,814	2,184	3,107	1,132	172	564	11,972
<b>Teacher ratio</b>	<b>14.9</b>	<b>14.2</b>	<b>14.5</b>	<b>13.1</b>	<b>10.6</b>	<b>14.0</b>	<b>14.4</b>

\*Note: Following the methods of the earlier report (MEPRI, 2015), the sample used to calculate ratios in Table 4 included small and isolated schools. Thus the ratios in Table 4 are not identical to those depicted in Tables 1 through 3.

When the EPS formula was developed using data from FY1998, the ratios were substantially higher—about 18 students per teacher in grades K-8 and 16 students per high school teacher. Thus the declining ratios seen between FY2014 and FY2017 were the continuation of a trend that has been happening for at least the past two decades.

## Comparison By School Characteristics

The analysis also examined student-to-teacher ratios comparing current ratios by school size, poverty level and proficiency level.

### School Size

Student-to-teacher ratios for most EPS staff positions increase with increasing school size. Table 5 depicts this effect of school size on teacher ratios. For both elementary and middle schools, small schools were those with on average less than 15 per grade, medium schools 15-28 students per grade, and larger schools, 29 or more students per grade. For high schools, size was measured at the school level: small schools had 99 or fewer students, medium schools had 100 to 199 students, and large schools had 200 or more.

	Elementary Schools	Middle Schools	High Schools
Small	12.1	-	13.7
Medium	13.8	13.1	13.1
Large	15.2	14.2	14.6

This effect is generally attributed to the economies of scale that can only be achieved in schools with a certain number of students. For example, small elementary schools—defined as having fewer than 15 students per grade level—typically provide one classroom per grade level. They must provide comprehensive instruction to the students who are enrolled, and thus may need to deliver classes that are smaller than would be desirable. Strategies such as multi-age classrooms and online learning may help to optimize student to teacher ratios, but options are limited.

### Poverty Level

Next, ratios were disaggregated based on the percent of students that were eligible to receive free or reduced price lunch. Schools within  $\frac{1}{2}$  standard deviation (9.4%) of the statewide mean of 48.3% poverty were considered to be of average poverty. The teacher ratios were the same for elementary schools across all poverty levels: 15 students per teacher FTE (Table 6). Ratios in middle and high schools increased with increasing poverty

level (i.e., schools with higher rates of student poverty had more students per teacher FTE). The ratio for high schools with high rates of student poverty (15.8) was close to the EPS funding level of 16 students per teacher, while for low poverty high schools the ratio (13.8) was well below the EPS ratio. This is generally considered to be a reflection of increased budget constraints in communities with lower property wealth, which raise less local funds for education through each mil of property taxes.

	Elementary Schools	Middle Schools	High Schools
Lower (0 to 39%)	15.0	13.8	13.8
Average (40 to 58%)	15.0	14.3	15.0
Higher (59 to 100%)	15.0	14.6	15.8
All schools	15.0	14.2	14.6
<i>EPS ratio</i>	<i>17</i>	<i>17</i>	<i>16</i>

As described above, Appendix A contains analysis of how federal Title I and special education funds have an impact on the overall staffing ratios in schools of varying levels of poverty. Because these supplemental funds—particularly Title I—are targeted at higher poverty schools, the overall ratios seen in schools are more evenly distributed once federal funding is considered. In essence, the federal funds enable the higher poverty schools to emulate the teacher staffing patterns seen in lower poverty schools.

As seen in Table 7, low poverty elementary schools hire more ed techs with general funds than high poverty schools. However, Table 7 also illustrates that the opposite pattern is seen in middle and high schools. High poverty schools hire more ed techs with EPS general funds than lower poverty schools, and as a result have lower student-to-staff ratios. This may be an example of school districts’ use of the additional funds from the EPS economically disadvantaged student weight to hire additional staff.

	Elementary Schools	Middle Schools	High Schools
Lower (0 to 39%)	100.8 (14%)	390.8 (33%)	328.5 (15%)
Average (40 to 58%)	109.1 (11%)	276.7 (33%)	317.9 (16%)
Higher (59 to 100%)	151.4 (30%)	285.8 (54%)	230.5 (0%)
All schools	116.0 (18%)	312.9 (36%)	313.6 (14%)
<i>EPS ratio</i>	<i>114</i>	<i>312</i>	<i>316</i>

Using the same three categories for lower, average, and higher poverty schools, Tables 8 through 10 provide student to staff ratios for all other staff positions by school poverty level. The percentage of schools with no reported staff in each position type is also provided. In most cases, the patterns replicate those seen above for teachers: higher poverty schools are more likely to have fewer (or zero) staff per student.

Position Type	<i>EPS Ratio</i>	Lower Poverty	Average Poverty	Higher Poverty	All Schools
Guidance	350	325 (5%)	342 (13%)	408 (21%)	359 (14%)
Health	800	472 (16%)	621 (40%)	673 (45%)	585 (36%)
Librarian	800	1,275 (60%)	1,505 (67%)	2,114 (78%)	1,601 (70%)
Library/media ed tech	500	442 (21%)	482 (32%)	489 (32%)	472 (29%)
Clerical	200	221 (3%)	183 (0%)	207 (1%)	202 (1%)
School admin	305	269 (0%)	251 (2%)	266 (4%)	262 (2%)

Position Type	<i>EPS Ratio</i>	Lower Poverty	Average Poverty	Higher Poverty	All Schools
Guidance	350	2523 (0%)	238 (0%)	265 (9%)	250 (3%)
Health	800	550 (11%)	651 (35%)	1,027 (52%)	661 (32%)
Librarian	800	639 (27%)	644 (29%)	1,243 (57%)	722 (36%)
Library/media ed tech	500	767 (42%)	1,032 (53%)	754 (57%)	849 (51%)
Clerical	200	199 (0%)	184 (0%)	168 (4%)	185 (1%)
School admin	305	248 (0%)	234 (0%)	244 (5%)	241 (1%)

Position Type	<i>EPS Ratio</i>	Lower Poverty	Average Poverty	Higher Poverty	All Schools
Guidance	350	171 (3%)	199 (3%)	209 (8%)	187 (4%)
Health	800	683 (3%)	866 (31%)	1,049 (42%)	793 (23%)
Librarian	800	716 (15%)	719 (19%)	787 (25%)	726 (19%)
Library/media ed tech	500	774 (27%)	760 (28%)	2,249 (75%)	846 (35%)
Clerical	200	141 (0%)	135 (0%)	138 (0%)	138 (0%)
School admin	315	255 (0%)	244 (0%)	259 (0%)	251 (0%)

The guidance staff ratio for higher poverty schools was larger than for other schools, especially among elementary schools (Table 8). This was primarily because they were also more likely to have no guidance staff (i.e., more schools with zero FTE were included in the ratio calculations). For example, 21% of high poverty elementary schools did not have school-level guidance staff compared to 5% of low poverty schools. The guidance ratio was above the EPS level of 350 students only for higher poverty elementary schools; the ratios

for lower and average poverty schools were at or below the EPS ratio. Guidance ratios for middle and high schools were lower than EPS, meaning schools are hiring more staff than the model provides.

Student-to-nurse ratios were also significantly higher among schools with higher rates of student poverty. This was true across all grade levels and primarily because higher poverty schools were more likely to have zero nursing FTE (i.e., more schools with zero FTE were used in the calculations). High schools with higher student poverty rates were less likely to have nursing staff, and among those that did, higher poverty schools were also more likely to have nurse ratios above the EPS ratio (43% compared to 23% of low poverty schools). Nurse ratios were below the EPS ratio of 800 students per nurse except for higher-poverty middle and high schools.

Librarian/media specialist ratios were also significantly higher for high poverty schools, especially at the elementary and middle school levels. Statewide ratios among elementary schools increased with school poverty level and all were significantly above the EPS ratio of 800 students per librarian FTE. Statewide ratios also increased with school poverty level among middle schools with the ratio for high poverty schools (1,243.0) significantly greater than 800. The differences in ratios by school poverty level were less pronounced among high schools and all were below the EPS ratio of 800.

Schools with higher rates of student poverty were also less likely to have library/media educational technician staff compared to schools with lower rates of student poverty, but their ratios were not always higher than those of other schools. High poverty elementary and middle schools were somewhat more likely than low poverty schools to not have library/media ed tech staff but when they did, they were actually more likely to have ratios below the EPS recommended 500 students per FTE. The fact that the ratio for high poverty high schools was so much larger than for other schools is driven largely by the fact that a much higher percentage were without library/media ed tech staff.

Student-to-clerical staff ratios did not differ substantially by school poverty level. There was also no significant difference in statewide administrator ratios by school poverty level. Clerical ratios were on par with EPS in elementary and middle schools, and lower than EPS in high schools. Administrator ratios were below EPS at all grade levels and poverty levels.

In summary, it does not appear that higher poverty districts are using the supplemental funds provided through the economically disadvantaged student weight in the EPS formula to increase guidance, health, or librarian staffing beyond what is provided through the EPS staff ratios. However, they may be using those funds to increase staffing of elementary teachers and of middle and high school educational technicians to levels that are equal or above that of their lower-poverty district peers.

### **Academic Performance**

The next series of analysis investigated student-to-teacher ratios in schools of varying academic performance. The fact that there is a moderately strong negative correlation between a school's poverty rate and its proficiency levels (i.e. schools with higher levels of poverty tend to have lower academic achievement) means that both factors must be taken into consideration. To address this question, we examined ratios by proficiency level across schools with similar poverty.

In this approach, Maine schools were divided into the same three tiers of student poverty level (lower, average, and higher) as in the poverty analysis, based on the percent of students eligible for free or reduced-price lunch. They were then further divided into three levels (lower, average, and higher) based on student academic achievement on annual state assessments. Taking the average of the math and English proficiency rates, we categorized schools as being of "average" proficiency if the percentage of students at or above proficient was within one standard deviation (12.4%) of the state average percent proficient (45.3%). Schools below one standard deviation of the average proficiency rate were categorized as having lower levels of proficiency and schools whose proficiency rate is one standard deviation above the mean were categorized as having a higher level of proficiency. As a result, Maine schools at each of three grade levels were sorted into nine categories based on their combination of poverty and academic performance. This approach is a standard aspect of the component review and represents an acknowledgement that not all schools are performing at the level that is expected for students to achieve the Maine Learning Results. Hence, the ratios present in low-performing schools may not be exemplary for informing the EPS model ratios.

Table 11 illustrates the characteristics of each grouping, including the number of Maine schools that fall into each category. It is noteworthy that because of the correlation between poverty and performance, some categories are represented by very few or even zero schools. Groups represented by fewer than five schools (in bold font) are not considered statistically robust.

Table 11. Number of Maine schools in each Category of Poverty and Performance

		Proficiency Level		
		Lower (0-32%)	Average (33-58%)	Higher (59-100%)
Poverty Level (% FRPL)	Elementary Schools			
	Lower (0-39%)	<b>0</b>	20	31
	Average (40-58%)	<b>4</b>	61	9
	Higher (58-100%)	28	57	<b>2</b>
	Middle Schools			
	Lower (0-39%)	<b>0</b>	14	12
	Average (40-58%)	<b>4</b>	30	<b>0</b>
	Higher (58-100%)	9	12	<b>0</b>
	High Schools			
	Lower (0-39%)	<b>1</b>	18	14
	Average (40-58%)	<b>4</b>	29	<b>2</b>
	Higher (58-100%)	5	6	<b>0</b>



Given those qualifications about data integrity, Table 12 provides the student-to-teacher ratios in each of the poverty and performance categories for each school level.

	Lower Proficiency	Average Proficiency	Higher Proficiency
<b>Elementary Schools</b>			
Lower poverty	--	15.6 (11.7-20.2)	15.1 (11.8-21.5)
Average poverty	16.4 (12.3-21.0)	14.9 (10.3-20.9)	14.5 (11.9-17.3)
Higher poverty	14.9 (10.8-23.3)	14.9 (10.8-21.0)	11.8 (10.2 & 14.0)
<b>Middle Schools</b>			
Lower poverty	--	14.0 (11.2-16.8)	13.5 (10.5-16.7)
Average poverty	13.8 (11.1-15.7)	14.4 (11.4-19.2)	--
Higher poverty	13.7 (12.7-14.5)	15.3 (10.9-18.2)	--
<b>High Schools</b>			
Low poverty	12.8 (N/A)	14.6 (10.5-18.2)	13.1 (11.6-15.8)
Average poverty	15.0 (13.6-16.1)	14.8 (11.4-19.2)	17.1 (17.0 & 17.2)
High poverty	16.6 (14.6-18.1)	15.2 (11.1-17.0)	--

Note: Ranges are school-level ratios for schools with staff. Criteria for poverty and performance levels are in Table 11.

When analyzing elementary schools with comparable poverty levels, the student-to-teacher ratios were slightly smaller in schools with higher rates of student proficiency. While this pattern is consistent with the idea that fewer students per teacher FTE is linked to improved student outcomes, because the sub-samples are small and the ranges in school-level ratios wide we interpret this trend with caution. The differences are marginally statistically significant. At the middle school level, on the other hand, there was no evidence that smaller ratios are helping student achievement. In fact, there were no high or average poverty schools ranking as “higher proficiency” and the teacher ratio among high poverty middle schools was actually larger for average proficiency schools (15.3) than it was for low proficiency schools (13.7). The same was true among average poverty schools. Among high schools, the evidence was mixed. The teacher ratio for high poverty

high schools with average rates of proficiency was lower than the ratio for high poverty/low proficiency schools, 15.2 and 16.6, respectively. However, for average poverty high schools the reverse was true: the two schools with high rates of proficiency had 17.1 students per teacher FTE compared to 15.0 among the four schools with low proficiency rates. As with elementary and middle schools, the low number of schools representing some of the categories means that results should be interpreted with caution.

### **Rural Schools**

After initial analysis, additional questions were raised about the variation in ratios for teachers, school guidance staff, library staff, and health professionals. Tables 13 through 15 provide ratios for these categories broken into the four categories of urbanicity/rurality (known as “locale” codes) as designated by the National Center for Educational Statistics. The codes are based on existing definitions of “urbanicity”, which include overall population, population density, and distance to the nearest urban center. In general, the patterns reflect a synthesis of those described above for other school characteristics.

<b>Table 13: Selected Staff ratios for Elementary schools by Rurality, 2016-17</b>				
	<b>City</b>	<b>Suburb</b>	<b>Town</b>	<b>Rural</b>
<i>Number of schools</i>	31	36	44	140
<i>Total enrollment</i>	11,449	12,939	12,306	33,043
<i>Avg enrollment</i>	369	357	280	236
<b>Teacher Ratios</b>				
FTE Teacher	748.6	853.0	808.0	2,231.9
Statewide ratio	15.3	15.2	15.2	14.8
% w/o Teachers	0%	0%	0%	0%
School-level ratio median (range)	15.0 (10.8-20.2)	14.7 (10.5-21.5)	15.3 (11.7-20.9)	14.7 (10.0-30.0)
% below EPS ratio (17)	74%	86%	86%	86%
<b>Guidance Ratios</b>				
FTE Guidance	30.8	37.4	32.0	93.7
Statewide ratio	371.7	356.0	384.6	352.6
% w/o Guidance	3% (1 school)	8% (3 schools)	20% (9 schools)	16% (22 schools)
School-level ratio median (range)	357 (232-720)	344 (178-782)	344 (110-1,480)	315 (79-848)
% below EPS ratio (350)	50%	51%	57%	63%
<b>Librarian / Media Specialist</b>				
FTE Librarian	5.9	11.0	11.8	14.8
Statewide ratio	1,940.5	1,176.3	1,042.9	2,232.6
% w/o Librarian	61% (19 of 31)	56% (20 of 36)	61% (27 of 44)	78% (109 of 140)
School-level ratio median (range)	1,013 (385-7,120)	538 (297-1,720)	460 (120-1,650)	640 (98-3,580)
% below EPS ratio (800)	50% (6 of 12)	67% (11 of 16)	65% (11 of 17)	58% (17 of 31)
<b>Educational Technician - Library / Media</b>				
FTE Library Tech	23.7	30.4	25.3	68.2
Statewide ratio	483.0	425.6	486.4	484.5
% w/o Lib Techs	19% (6 of 31)	19% (7 of 36)	30% (13 of 44)	34% (47 of 140)
School-level ratio median (range)	383 (232-587)	335 (115-1,092)	340 (148-810)	332 (86-980)
% below EPS ratio (500)	96% (24 of 25)	69% (22 of 29)	77% (24 of 31)	84% (78 of 93)
<b>Health / Nurse</b>				
FTE Nurse	19.4	25.3	26.4	48.0
Statewide ratio	590.1	511.4	466.1	688.4
% w/o Nurses	23% (7 of 31)	19% (7 of 36)	27% (12 of 44)	46% (64 of 140)
School-level ratio median (range)	429 (241-1,177)	423 (183-925)	351 (161-1,215)	427 (150-1,015)
% below EPS ratio (800) students per staff	92% (22 of 24)	97% (28 of 29)	97% (31 of 32)	93% (71 of 76)

Note: 4 elementary schools did not have NCES data. Includes only EPS positions with school IDs. Median and ratio ranges are at the school level and include only those schools with staff.

<b>Table 14: Selected Staff ratios for Middle schools by Rurality, 2016-17</b>				
	<b>City</b>	<b>Suburb</b>	<b>Town</b>	<b>Rural</b>
<i>Number of schools</i>	9	15	15	42
<i>Total enrollment</i>	4,282	7,147	6,290	12,766
<i>Avg enrollment</i>	476	477	419	304
<b>Teacher Ratios</b>				
FTE Teacher	311.0	497.4	427.4	915.9
Statewide ratio	13.8	14.4	14.7	13.9
% w/o Teachers	0%	0%	0%	0%
School-level ratio median (range)	14.0 (12.2-15.7)	14.2 (10.5-19.2)	15.3 (12.0-18.2)	13.9 (10.9-17.1)
% below EPS ratio 17	100%	87% (13 of 15)	93% (14 of 15)	95% (40 of 42)
<b>Guidance Ratios</b>				
FTE Guidance	17.6	28.4	24.0	52.1
Statewide ratio	243.3	251.7	262.1	245.0
% w/o Guidance	0%	0%	0%	5% (2 schools)
School-level ratio median (range)	267 (166-396)	270 (129-374)	267 (158-376)	247 (102-1,060)
% below EPS ratio 350	67% (6 of 9)	93% (14 of 15)	87% (13 of 15)	90%
<b>Librarian / Media Specialist</b>				
FTE Librarian	5.6	11.4	9.0	16.2
Statewide ratio	764.6	626.9	699.0	788.0
% w/o Librarian	11% (1 of 9)	20% (3 of 15)	40% (6 of 15)	45% (19 of 42)
School-level ratio median (range)	699 (309-7,320)	571 (270-3,580)	506 (243-676)	464 (190-1,335)
% below EPS ratio 800	50% (4 of 8)	92% (11 of 12)	100% (all 9)	78% (18 of 23)
<b>Educational Technicians - Library / Media</b>				
FTE Library Tech	0	9.2	7.8	18.9
Statewide ratio		776.8	806.4	675.4
% w/o Lib Techs	100%	40% (6 of 15)	53% (8 of 15)	43% (18 of 44)
School-level ratio median (range)	-	586 (252-1,368)	464 (188-1,215)	336 (106-1,378)
% below EPS ratio 500	-	44% (4 of 9)	57% (4 of 7)	71% (17 of 24)
<b>Health / Nurse</b>				
FTE Nurse	6.5	10.8	10.0	18.8
Statewide ratio	658.8	661.8	629.0	679.0
% w/o Nurses	11% (1 of 9)	27% (4 of 15)	33% (5 of 15)	38% (16 of 42)
School-level ratio median (range)	567 (400-792)	541 (278-734)	420 (267-676)	509 (121-1,250)
% below EPS ratio 800	100% (all 8)	100% (all 11)	100% (all 10)	92% (24 of 26)

Note: 1 middle school did not have NCES data. Includes only EPS positions with school IDs. Median and ratio ranges are at the school level and include only those schools with staff.

<b>Table 15: Selected Staff ratios for High schools by Rurality, 2016-17</b>				
	<b>City</b>	<b>Suburb</b>	<b>Town</b>	<b>Rural</b>
<i>Number of schools</i>	7	17	16	41
<i>Total enrollment</i>	6,588	10,112	10,229	17,238
<i>Avg enrollment</i>	941	595	639	420
<b>Teacher Ratios</b>				
FTE Teacher	415.3	707.6	680.5	1,223.1
Statewide ratio	15.9	14.3	15.0	14.1
% w/o Teachers	0%	0%	0%	0%
School-level ratio median (range)	15.5 (14.5-17.4)	13.5 (10.5-18.2)	15.5 (11.8-18.1)	13.9 (10.0-18.2)
% below EPS ratio (16)	71% (5 of 7)	71% (12 of 17)	69% (11 of 16)	85% (35 of 41)
<b>Guidance Ratios</b>				
FTE Guidance	34.0	60.8	50.9	90.5
Statewide ratio	193.8	166.3	201.0	190.5
% w/o Guidance	0%	0%	0%	0%
School-level ratio median (range)	221 (125-257)	172 (59-376)	206 (133-554)	179 (100-586)
% below EPS ratio (250)	86% (6 of 7)	94% (16 of 17)	94% (15 of 16)	74%
<b>Librarian / Media Specialist</b>				
FTE Librarian	6.0	15.6	15.1	24.1
Statewide ratio	1,098.0	648.2	677.4	715.3
% w/o Librarian	14% (1 of 7)	12% (2 of 17)	0%	29% (12 of 41)
School-level ratio median (range)	969 (734-1,464)	515 (237-1,244)	627 (419-1,994)	563 (247-1,850)
% below EPS ratio (800)	17% (1 of 6)	87% (13 of 15)	75% (12 of 16)	79% (23 of 29)
<b>Educational Technicians - Library / Media</b>				
FTE Library Tech	4.5	13.0	12.3	22.4
Statewide ratio	1,464.0	777.8	831.6	769.5
% w/o Lib Techs	43% (3 of 7)	29% (5 of 17)	31% (5 of 16)	37% (15 of 41)
School-level ratio median (range)	820 (514-1,191)	652 (237-1,670)	624 (266-932)	434 (99-1,407)
% below EPS ratio (500)	0% (all 4>500)	33% (4 of 12)	36% (4 of 11)	54% (14 of 26)
<b>Health / Nurse</b>				
FTE Nurse	7.0	16.3	11.5	20.9
Statewide ratio	941.1	620.4	889.5	824.8
% w/o Nurses	0%	12% (2 of 17)	25% (4 of 16)	32% (13 of 41)
School-level ratio median (range)	908 (589-1,464)	515 (255-931)	637 (461-1,994)	640 (235-1,126)
% below EPS ratio (800)	43% (3 of 7)	93% (14 of 15)	83% (10 of 12)	71% (21 of 28)

\* Note: Includes only EPS positions with school IDs. Median and ratio ranges are at the school level and include only those schools with staff.

## Further Data Limitations

One limitation of the staff data is missing school IDs. For example, in the 2016-17 staff data, 21% of the EPS school nurse positions, 7% of the EPS guidance staff, and 18% of the EPS Librarian/Media Specialist positions were missing school IDs. Without a school ID, the staff position cannot be determined to be in our sample (described above) nor can it be assigned as elementary, middle, or high school level. They also cannot be further categorized by school poverty or proficiency level. Because these positions cannot be assigned to a specific school, they were not able to be used in the ratio calculations. As we show below, this had fairly minor impacts on the statewide ratio calculation for ed techs, guidance staff, and library/media ed techs. The missing FTEs have somewhat more of an impact on nurse and librarian positions. The impact of not using these positions in the analysis by school type (elementary, middle, high) or by size, poverty and proficiency level cannot be determined. This issue does not affect teachers, clerical, staff and school administrators, which require assignment of one or more school IDs during the staff data entry process and thus have 100% reporting.

	% of EPS positions without School ID (Sum of FTEs)	Statewide student-staff ratios using staff reported as school level	Statewide student-staff ratios including staff without school IDs	EPS ratios (Elementary, middle, high)
Ed techs	2% (33.9)	167.7	162.2	114/312/316
Guidance	7% (42.9)	266.6	249.5	350/350/250
Health	21% (58.3)	637.5	521.4	800
Librarian	18% (16.0)	1,005.8	917.4	800
Library/Media Ed Tech	3% (8.5)	601.2	583.4	500

One possible explanation for reporting a staff member without an associated school is that the individual works at the district level. In the case of district-level administrative roles, the position should not be included in the EPS school staff ratios, as those roles are included in the EPS System Administration component. This may be the case for positions such as Director of Guidance, which may or may not work directly with students in a school setting. However, it is more likely that these positions serve multiple schools, which makes the reporting process more complicated. For example, to attach a school ID to a nurse

serving three schools, he or she would need to be reported as three separate positions (one per each school served). This is made more complicated by the fact that the reporting system captures position FTE to only the tenth decimal place (i.e. 0.1), so that one-third or one-quarter positions have to be rounded off to the nearest tenth (0.3 or 0.3, respectively). If the system does not require that a school ID be entered, reporters may be taking the most straightforward path by reporting the staff member as a single district-level position rather than multiple school-level roles. This under-reporting of school-level staff may be affecting the overall state-level nurse ratios by as much as 22% if all health professionals were associated with a school, and would decrease Librarian ratios by 10%. Other positions would be affected to a much lesser extent.

### **Discussion & Policy Implications**

In this section, we summarize and reflect upon the findings overall and for each staff position type.

#### **General**

The most salient finding in the analysis is the trend of increased staffing levels over time. When the initial EPS ratios were developed and adopted, the formula provided *more* staff per student than were present in Maine schools at the time in an effort to increase resources to schools. However, as student enrollments have declined in recent decades, particularly in Maine's rural areas, the number of students per staff member has also declined. The staffing levels are now more favorable (i.e. more staff per student) than EPS funds. This may be because staff reductions almost always lag behind enrollment decreases; schools will continue to employ staff to serve their students as long as they can. When the number of students becomes so low that positions can no longer be sustained, schools will eventually find other means to support their students' needs such as through staff sharing with multiple schools, hiring consultants only as needed, or doing without the service. Often, decisions to eliminate staff positions are made when an employee retires (or leaves for another reason), making it less controversial to look at alternatives to hiring a replacement—particularly in specialized fields where professionals are in short supply.

Teacher positions are typically among the last to be eliminated. Classrooms of students need teachers to function, and the mechanisms for reducing classrooms are quite

limited. Often, schools will move to multi-age classrooms as a first step to manage declining enrollments, and will close schools only in extreme cases. This means that teacher ratios can serve as a bellwether for a given school's status with respect to having a robust population of students. For example, Table 3 showed that there were schools at all grade levels operating with as few as 10 students per teacher. Because geographically isolated small schools were excluded from the sample, these schools were operating within eight miles (for elementary schools) or ten miles (for high schools) of another Maine public school. School districts with these enrollment patterns face difficult decisions about whether to continue to operate so far below the staffing levels provided in the EPS formula. If they wish to keep schools open for small numbers of students, they must subsidize the required additional staff with local funding. This raises a looming question with which policymakers must grapple: to what extent should the EPS formula recognize the demographic reality in rural areas and provide additional funding for them to help keep their community schools open, versus keeping the ratios at a level consistent with efficient operations and using budget constraints to force conversations about school restructuring?

Another cross-cutting issue is the question of how to interpret staff that are not reported with an affiliated school (i.e. missing a school ID). In theory, the positions categories that are included in the analysis are expected to work with student. This is why they are funded as a student ratio and not some other mechanism in the EPS model. Thus it is plausible to expect that each of these position types would be affiliated with one or more schools. We recommend additional investigation to determine why districts are reporting staff without a school ID. If there are not compelling reasons for this practice, we suggest changing the reporting process to require entry of a school ID for all positions that are to be included in EPS ratios, as is the current practice for teachers, school administrators, and school clerical staff. In particular, this would improve our understanding of staffing patterns for social workers, nurses, and librarians.

## **Teachers**

As noted in the findings, the teacher ratio was below the EPS funding ratio by 2.1 students per full-time teacher for elementary schools (12% below EPS), 2.8 students per teacher for middle schools (16% below EPS), and 1.4 students per full-time teacher for high



schools (9% below EPS). School districts are investing in additional teachers beyond what the EPS staff ratios provide based on their student enrollment. This is the case even in higher poverty schools, despite the typical budget challenges present in lower-income communities. This is an indication that higher poverty communities may be directing funds allocated through the EPS Economically Disadvantaged student weight to fund additional teachers. They may also be making tradeoffs with other types of resources (staff or otherwise) to afford more teachers within EPS funding levels, or they may be raising additional funds above and beyond the EPS minimum allocation through local taxes.

For context, we can describe student-to-teacher ratios for other states using data from the National Center for Educational Statistics (NCES, 2018).<sup>1</sup> Due to differences in calculation methods, the ratios are not directly comparable to those reported above. For all grade levels combined, the overall student-to-teacher ratio in the U.S. was 16.1 in FY2014, compared to 12.2 for Maine using the NCES methodology. This ranks second to lowest among the New England states, with only Vermont (10.6) having a lower ratio. New Hampshire (12.5), Connecticut (12.9), Massachusetts (13.3), and Rhode Island (15.0) all had higher ratios, meaning they employ fewer staff per student than Maine. This trend generally aligns with the relative population densities of the states. As discussed in the section above, policymakers may wish to consider several factors, including state vs. local interests and efficiency vs. retaining small community schools, when determining whether the EPS teacher ratios merit adjustment.

### **Educational Technicians**

Ratios for educational technicians (ed techs) were recently adjusted based on the actual calculated ratios from FY2014 in the prior review of staff ratios. Thus, it is perhaps unsurprising that the ratios in FY2017 are still closely aligned to the actual funding levels in the formula. The ed tech ratios do not warrant additional adjustment at this point in time based on these analyses.

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<sup>1</sup> [https://nces.ed.gov/programs/digest/d16/tables/dt16\\_208.40.asp](https://nces.ed.gov/programs/digest/d16/tables/dt16_208.40.asp)

## Guidance

Overall, ratios for guidance staff were lower than the 350 students per staff FTE recommended by EPS for all poverty levels at the middle and high school levels. For middle schools the ratios were 252.9, 238.9 and 265.3 for low, average and high poverty schools respectively; for high schools, the ratios were 171.4, 198.5 and 209.2. Ratios in elementary schools are at or above EPS, with the highest ratios seen in the higher poverty school group (324.8, 341.7 and 408.2).

A national review of staffing levels for school guidance counselors (NACAC and ASCA, 2018) compared overall statewide ratios (including all grade levels) across the United States. The report provided student-to-counselor ratios and trends in the 10-year span between 2004-05 and 2014-15. The professional organizations recommend an overall student-to-counselor ratio of 250:1. The national ratio is 482:1, and Maine's ratio in FY2015 calculated using NCES data was 315:1. According to their analysis, Maine's ratio increased 3% between FY05 and FY15, up from 306 in FY05. While Maine remains above their recommendations overall, it is noteworthy that the ratios in middle schools of all poverty levels are on par with their recommendations of 250 students per counselor, and ratios in high schools were well below that number (see above paragraph or Tables 8, 9 and 10). Though the report did not include a detailed description of methodology, it is likely that the NCES report only included school guidance counselors and did not also include social workers as in Maine's definition. Only three states had ratios that met their recommendations, and all three have similar demographics to Maine: New Hampshire, Vermont, and Wyoming.

Guidance staff includes guidance counselors, directors of guidance, and also school social workers. Statewide there were 601 EPS guidance counselor positions (totaling 518.1 FTE) and 23 Directors of Guidance positions (18.7 FTE) funded by EPS. Statewide there were 448 school social workers, but only 45% were EPS positions (totaling only 154.2 FTE). The remaining 55% were funded through state or federal special education, federal Title I, federal Title IV, or other non-general fund sources.

It is noteworthy that higher poverty schools have less guidance staff paid through EPS funds, including a higher proportion of schools with zero EPS guidance staff (e.g. 21% in higher poverty elementary schools compared to 13% in average and 5% in lower-

poverty elementary schools). This is a concerning trend, given the role of guidance staff in supporting students with social and emotional needs. This merits additional investigation. For example, future analysis could look at the 55% of school social workers that are non-EPS positions (i.e. funded through federal or special education sources) to determine whether they are more prevalent in higher-poverty districts. As mentioned above there were approximately 56 guidance staff positions without school IDs; additional investigation might reveal that some of these are working in high poverty schools. It would also be of interest to conduct further qualitative research on the changing staffing trends for social workers, licensed clinical counselors, and school guidance counselors in schools. The growth of social workers and clinical counselors suggests that schools may be creating a new staff role that is distinct from the traditional duties of a guidance counselor. This evolution toward providing mental health services shares some common ground with the role of nursing and health staff, and may warrant different treatment in the EPS formula.

## **Health**

The ratios for nurses and other health professionals are overall on par with EPS for high schools, and below EPS for elementary and middle schools. As described in the findings section, about 19% of all health staff positions were missing school IDs and were unable to be included in the calculations, which makes these ratios even lower in actuality.

However, the health staff ratios varied substantially by school poverty level. Once separated in to their poverty subgroups, higher poverty schools employed fewer nurses. At the elementary level, higher poverty schools had about 200 more students per nurse than lower poverty schools. This was largely driven by the fact that 45% of higher poverty elementary schools had no associated health staff (i.e. assigned the school ID) compared to 16% for lower poverty schools. However, when considered overall, elementary schools across all three poverty levels employed more nurses than provided by EPS. At the middle school level, the same trend holds true, except that the ratio for higher poverty schools (52% of which had zero health staff) was substantially above the EPS funding level, while lower and average poverty middle schools had fewer students per teacher than EPS provides. For high schools, however, both average and higher poverty levels had fewer

nurses than provided through EPS, including 42% of high poverty high schools with zero health associated health staff.

The National Association of School Nurses (NASN) recommends ratios of “one school nurse to 750 students in the healthy student population; 1:225 for student populations requiring daily professional nursing services; 1:125 for student populations with complex healthcare needs; and 1:1 for individual students requiring daily, continuous professional nursing services.” However, they also caution that a “one-size-fits-all workload determination is inadequate to fill the increasingly complex health needs of students and school communities” and that staffing should consider the individual context of each school’s specific student needs. Thus while the overall ratio seen in Maine of around 637 students per health professional is below the recommendation for typically healthy students, some Maine students require routine care. Without knowing the numbers of students in each school that require daily or ongoing support, we are unable to directly compare Maine ratios to these national recommendations. Notably, high poverty middle and high schools have ratios of 1,027 and 1,049 (See Tables 9 and 10), respectively, well above the NASN recommendation. If students in high poverty districts require more nursing services, these ratios could be too high.

### **Librarian/Media Specialist & Ed Techs for Library/Media**

These two position categories are discussed in tandem, as they are related. The EPS category of “Librarian / Media Specialist” denotes a single position type that requires the credential of Library Media Specialist. The credential requires a bachelor’s degree and training in library science, which is typically graduate-level study. Most librarians have advanced degrees. The “Educational Technician--Library/Media” position type includes paraprofessionals with three possible credential levels (I, II, or III) that do not require a bachelor’s degree nor any specialized training. Commensurate with their required credentialing, the role of a librarian demands more specialized knowledge and skill than the expectations of educational technicians for library/media.

The position title of “Librarian / Media Specialist” was designated over simply “Librarian” to connote the changing role of this position in today’s digital age. These professionals are increasingly involved in instructing students in the skills for locating

information found electronically rather than in a physical library. They also help students learn how to evaluate the quality and credibility of information found online, through either direct engagement with students or by supporting teachers in teaching these skills. Librarians are also often a local resource to teachers for guidance on effective ways to integrate technology into instruction, either formally or informally.

As can be seen in Table 2, school levels with higher ratios for librarians have lower ratios for library/media ed techs, and vice versa. Namely, elementary schools are hiring more library ed techs and fewer librarians than provided in EPS, and middle and high schools are opting for more librarians and fewer paraprofessionals.

The staffing patterns for these roles show notable differences depending on the school poverty level. Librarians in higher poverty schools are serving up to twice the number of students as their peers in lower poverty schools, and also tend to have fewer paraprofessional colleagues for library/media ed tech support. This represents a sizeable resource gap for students and teachers in those schools when they need information about digital literacy.

However, the unanswered question with respect to these positions is whether the current staffing levels are adequate. Given dramatic changes in technology since the inception of the EPS model—including widespread adoption of 1:1 computing devices in most Maine secondary schools—it is unclear whether the staffing ratios need to be reconsidered. This is a question that merits additional research about the range and types of services being provided by librarians and library paraprofessionals in schools of various grade levels. Nationally, U.S. schools employ one full-time librarian for every 1,129 students (Tuck and Holmes, 2016). Maine is at or below this mark in middle and high schools of all poverty levels, and above it for elementary schools.

### **Clerical**

Unlike most of the other staff position types, the ratio of students to clerical administrative support staff in Maine schools appears to be about the same as the level provided in EPS for elementary and middle schools. Only high schools have lower student ratios. There was also no discernible pattern of disparity between schools of different poverty level. The ratios do not warrant adjustment at this time.

## **School administration**

The number of principals and assistant principals in Maine schools is about 15% to 20% higher than the number provided in the EPS formula. In other words, there are significantly fewer students per Maine administrator than were present when the ratios were established two decades ago to be on par with actual data. Thus administration has seen the same trend as for teachers with fewer students per staff in the face of declining enrollments.

Interestingly, although the EPS formula provides more administrators for elementary and middle schools than for high schools, the patterns of ratios do not differ by school level. This raises the question of whether the three school levels should have different staff ratios. It may simplify EPS calculations and future administrator ratio analyses if all school levels were assigned the same ratio.

## **Summary**

Because schools use EPS-allocated resources other than those provided by the formula's staff ratios to hire staff, it is not an exact science to use the actual staffing patterns found in Maine schools to inform the adequacy of the model ratios. Comparison to the EPS ratios is more useful to analyze how schools are choosing to invest in different types of staff. The fact that most staffing levels are at least at the level envisioned in the EPS ratios provides reassurance that districts are not unduly constrained in hiring the staff that they feel are necessary. However, additional investigation may be warranted to more fully understand the circumstances of schools with atypically high or low staffing ratios. If ratios are high or low by local choice, then the current EPS ratios appear to be adequate. However, if a district has atypically high or low staffing levels due to constraints such as geography, enrollment, and/or taxpayer demand, then it is important to understand whether the staffing levels are adequate for their students. If not, additional policy levers should be considered. The tension between operational efficiency and communities' desire to retaining small local schools is also a factor in policy decisions.

## References

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## Appendix A: Instructional Staff ratios including Title I positions

Table A1: Student-Teacher ratios by grade span 2016-17 with and without Title I teachers				
	K-5/6	6-8/7-8	9-12	All schools
Statewide ratio w/o Title I	14.9	14.2	14.6	14.6
Statewide ratio w/ Title I	14.6	14.1	14.6	14.4
EPS ratio	17	17	16	

Table A2: Ed Tech ratios w/ and w/o Title I techs by grade level (% without ed techs)			
	Elementary	Middle	High
Statewide ratio w/o Title I	116.0 (18%)	319.8 (36%)	316.6 (16%)
Statewide ratio w/ Title I	75.7 (6%)	275.1 (27%)	309.9 (15%)
EPS ratio	114	312	316

The statewide ratio for elementary schools when Title I funded technicians were not included was 116 students per ed tech FTE, almost exactly the EPS recommended 114. When Title I funded ed techs were included, the ratio dropped to 76 students per ed tech FTE. The role of Title I in enabling more schools to hire more ed techs was also evident among middle schools: when Title I staff are included in the calculations the ratio drops from 320 to 275, below the recommended 312 students per ed tech FTE. The ed tech ratio for high schools, even when Title I staff included, was almost exactly the EPS recommended 316 students per ed tech FTE.

Table A3: Teacher ratios Including Title I Teachers by poverty level			
	Elementary	Middle	High
Lower poverty	14.8	13.8	13.8
Average poverty	14.6	14.3	15.0
Higher Poverty	14.5	14.4	15.8
EPS Ratio	17	17	16



Not surprisingly, given the targeting of the Title I program, when Title I teachers were included in the calculations, high poverty and average poverty ratios dropped the most – by 0.5 and 0.4, respectively – while the ratio dropped by only to 0.2 for low poverty elementary schools. High poverty middle and high schools also had larger ratios than average and low poverty schools. When Title I teachers were included in the calculations, high poverty middle schools looked more like average poverty middle schools. Reflecting the fact that Title I targets lower grade levels, there was no Title I equalizing effect among high schools.

Table A4: Ed Tech ratios including Title I staff by poverty level			
	Elementary	Middle	High
Lower poverty	81.9	384.2	328.5
Average poverty	72.2	240.5	302.6
Higher Poverty	75.6	179.4	230.5
EPS Ratio	114	312	316

The effect of the program on ed tech ratios was also strongest among higher poverty schools and at the elementary and middle school levels. The statewide ed tech ratio for elementary schools with high rates of student poverty was larger than other schools by 40 to 50 students per ed tech FTE but when the Title I technicians were included, the ratios were virtually the same across poverty level. On the other hand, among middle and high schools, the ratio for high poverty schools was smaller than for low poverty schools (i.e., high poverty schools had fewer students per ed tech FTE), indicating that schools with more economically disadvantaged students hire more ed techs to help in the classroom. This effect becomes even more pronounced, at least for middle schools, once Title I funded ed techs were included in the calculations. Indeed, the ratios for low and average poverty middle schools remained at or slightly above the EPS recommended 312 even after Title I staff are included.