REL NORTHWEST

A SNAPSHOT OF EDUCATOR MOBILITY IN MONTANA:

Understanding issues of educator shortages and turnover

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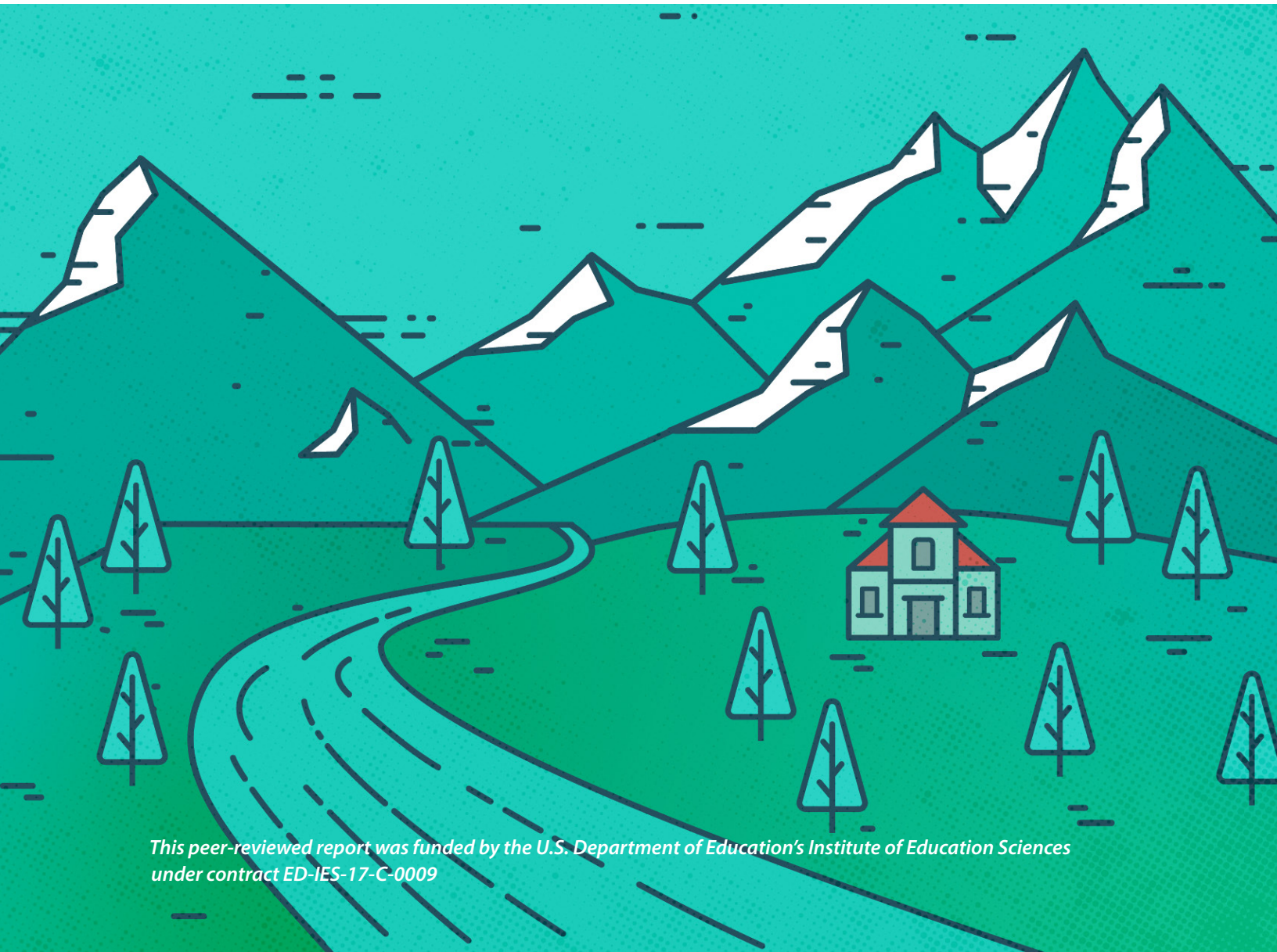

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About REL Northwest

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Executive summary

This study was conducted at the request of education policymakers who participate in the Montana Rural Recruitment and Retention Task Force. Like many states, Montana is struggling to recruit and retain qualified educators, especially in certain subject areas and in more rural parts of the state. The purpose of this study is to provide information that will help the task force address these challenges. Task force members asked REL Northwest to examine the following questions:

1. ***What is the extent of educator shortages in the state in 2017/18?***
    - How do educator shortage patterns vary by characteristics of school systems?
2. ***To what extent did educators stay in their position and school system, move to a different position within the school system, move to a different school system, or leave the public education system between 2016/17 and 2017/18?***
    - How do educators' decisions to stay, move, or leave school systems and/or positions vary by the characteristics of educators and school systems?
3. ***To what extent were teachers and principals in Montana employed in multiple roles within their school systems and/or within multiple school systems in 2016/17?***
    - How did patterns in holding multiple roles differ by the characteristics of school systems?

To examine these questions, REL Northwest used statewide administrative data from 2016/17 and 2017/18.

Task force members were also interested in the intended mobility of educators in the following school year (2018/19), including factors associated with accepting their current position, and—for administrators—the top barriers they faced to hiring teachers. To meet this request, we examined data from an existing statewide survey of teachers, principals, and superintendents, and we provide the findings in an appendix.

Task force members and other policymakers in Montana will use this information as they determine how to address the state's educator workforce challenges. Given the high percentage of schools located in rural areas in Montana, the study findings may be useful to other states with similar demographics.

Key findings

Educator shortages in Montana

- In the 2017/18 school year, district administrators in Montana reported that 62 percent of positions in shortage subject areas, such as math and science, were difficult to fill or unable to be filled.
- In the 2017/18 school year, rural school system administrators reported a higher percentage of positions as difficult to fill or unable to be filled, as compared to non-rural school system administrators.

Educator mobility and attrition in Montana

- In the 2017/18 school year, 86 percent of teachers and 87 percent of principals in Montana returned to the same position and school system they were working in the previous school year.
- Among educators who did not stay in their position and school system from 2016/17 to 2017/18, more than half left the Montana public education system.
- The percentage of teachers who stayed in their position and school system was higher in school systems with a below-average proportion of American Indian students, school systems located in non-rural areas, and school systems with higher enrollment.
- Among teachers who moved between school systems, more teachers moved from rural to non-rural areas (29 percent) than from non-rural to rural areas (21 percent), indicating that rural school systems lost teachers to non-rural school systems from 2016/17 to 2017/18.
- The percentage of principals who stayed in their position and school system was higher in school systems with a below-average proportion of American Indian students, those with lower levels of poverty, those with higher enrollment, and those located in non-rural areas.

Multiple educator roles

- In the 2016/17 school year, 29 percent of Montana teachers and 24 percent of principals held multiple positions. This percentage was higher in school systems located in the most remote rural areas, where 36 percent of teachers and 40 percent of principals held more than one position.

Contents

Figures

Tables

Educator shortages: Existing evidence

How serious are educator shortages in the United States? In recent years, the difficulty of recruiting and retaining qualified teachers and administrators has been called a national crisis by researchers, policymakers, and members of the media (Garcia & Weiss, 2019). In Montana, the focus of this study, educator shortages have been the subject of state legislative sessions, although there is currently little empirical evidence on the topic.

One factor that influences the shortage of educators is the decline in the number of students who enroll in and graduate from teacher preparation programs (Aragon, 2016). Contributing to the argument that there is a teacher shortage are the most recently available data on enrollment in teacher preparation programs in the United States, which fell from 725,000 in 2009/10 to 441,439 in 2015/16 (U.S. Department of Education, 2017). Following national trends, the number of students completing teacher preparation programs in Montana also fell over time, from 792 in 2012/13 to 661 in 2015/16 (U.S. Department of Education, 2017).

In contrast, other research suggests that this recent decline masks a four-decade trend of increased supply of new teachers (Blom, Cadena, & Keys, 2015). In particular, some research indicates that between 1987 and 2011, only about a third to half of all new teachers were hired into teaching positions in public schools, suggesting that the availability of teachers outpaced demand (Cowan, Goldhaber, Hayes, & Theobald, 2016). In addition, student-teacher ratios have slowly declined over the past two decades. For some, these data suggest that claims of a national teacher shortage crisis have been exaggerated (Cowan et al., 2016).

These overall trends also mask differences across more targeted areas, such as shortages by subject area or geographic area (Cowan et al., 2016; Dee & Goldhaber, 2017). States have consistently struggled to fill vacancies in special education, bilingual education, and STEM subject areas (Cross, 2017), while rural schools and districts have faced more severe educator shortages than those in suburban and urban areas (Lazarev, Toby, Zacamy, Lin, & Newman, 2017).

Montana is a case in point. In 1991 the state identified educator shortages at the county level in only two subject areas, biology and reading (K–12). By 2017, that number had increased to 12, encompassing both subject areas and specific roles, such as art, career and technical education, English, mathematics, music, school counselor, school librarian, school psychologist, science, social studies, special education, and world languages (Cross, 2017).[1] Anecdotally, those shortages have been most acute in rural and remote areas of Montana (Seifert, Harmon, & Downey, 2017), but no prior work has examined the issue using school-level state administrative data.

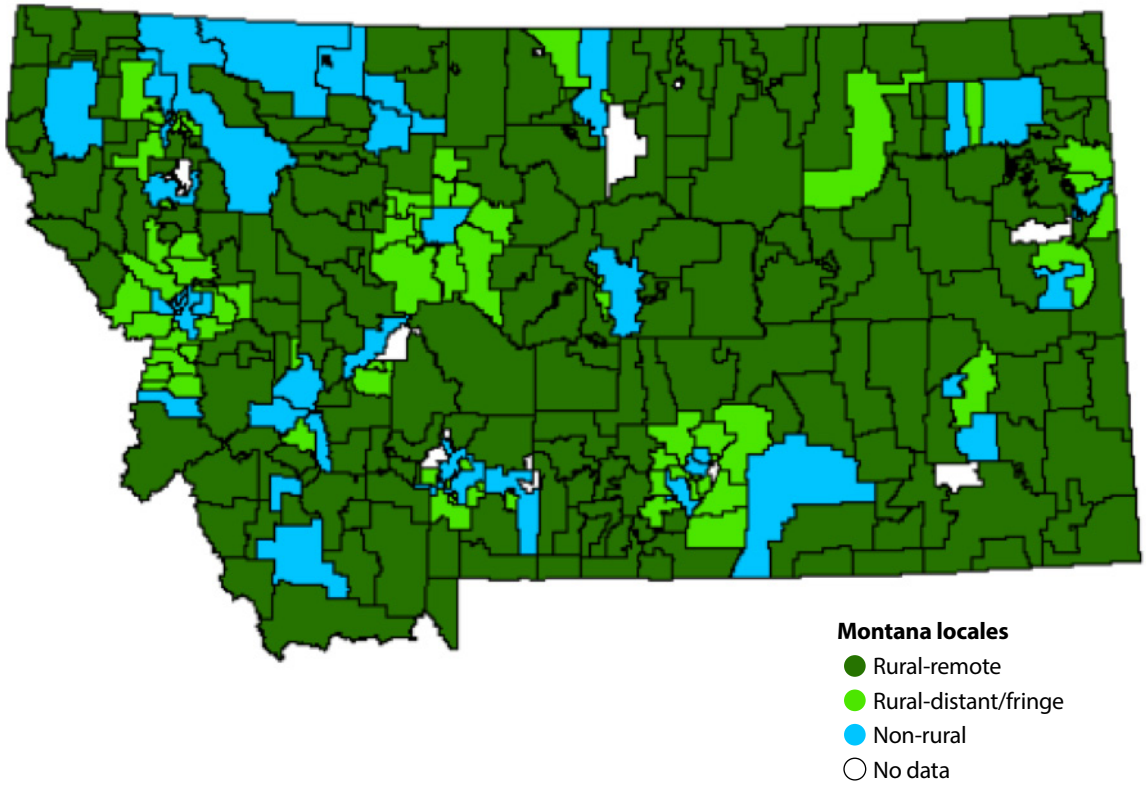
The heavy concentration of school systems located in rural areas in Montana amplifies concerns about educator shortages. In Montana, a school system is defined as all districts and schools operating within a single building, town, or city,[2] and rurality is defined using categories established by the U.S. Census Bureau.[3] As shown in figure 1, in the 2016/17 school year, 86 percent of Montana school systems were located in rural areas, with 61 percent (N = 185) of school systems in areas designated as rural-remote (areas shown in dark green), and 25 percent of school systems in areas designated as rural-distant or rural-fringe (areas shown in light green). In 2016/17, most teachers in Montana were employed in non-rural areas, followed by rural-remote areas and rural-distant/fringe areas. Rural-remote school systems employed 26 percent of the state's teachers and served 20 percent of students (or 30,207 students). Rural-distant/fringe school systems employed 14 percent of teachers and served 14 percent of students (or 21,021 students). Meanwhile, only 14 percent (N = 42) of Montana's school systems were located in non-rural areas (shown in blue in figure 1), but those school systems employed 60 percent of the teacher workforce and served 66 percent of students (or 100,476 students).

[1] The U.S. Department of Education encourages each state education agency to identify its proposed teacher shortage areas based on the prescribed methodology and other requirements in 34 CFR 682.210(q)(6)(iii).

[2] Most communities in the state operate their elementary and high school districts as separate legal entities, but they may share the same building and staff, which means the same superintendent might serve two districts. As a result, district-level data often suggest that Montana has many teachers and administrators working part-time and in multiple districts when, in fact, a single teacher's or administrator's full-time equivalency may be split across two districts.

[3] Rurality is based on U.S. Census Bureau definitions. A rural-remote area is defined as one that is more than 25 miles from an urbanized area and more than 10 miles from an urban cluster. A rural-distant/fringe area refers to both rural-distant and rural-fringe areas. Rural-distant is defined as a rural territory that is more than 5 miles but less than or equal to 25 miles from an urbanized area, as well as rural territory that is more than 2.5 miles but less than or equal to 10 miles from an urban cluster. Rural-fringe is defined as a rural territory that is more than 5 miles but less than or equal to 25 miles from an urbanized area as well as rural territory that is less than or equal to 2.5 miles from an urban cluster.

Figure 1. Sixty-one percent of Montana school systems were in rural-remote areas in the 2016/17 school year



Note: The outlines are school districts in Montana.

Source: Authors' analysis of Terms of Employment, Accreditation, and Master Schedule data for the 2016/17 and 2017/18 school years and the Common Core of Data for the 2016/17 school year.

Educator attrition and mobility

Two factors that have contributed to educator shortages, both in Montana and nationally, are the departure of educators from the profession (referred to as attrition) and the movement of educators between positions and school systems (referred to as mobility). Nationally, the percentage of teachers who leave the profession each year has increased from about 5.6 percent in 1989 to 7.7 percent in 2013, according to the most recent year of available data (Sutcher, Darling-Hammond, & Carver-Thomas, 2016). During that same period, an additional 9 percent of U.S. teachers moved from one school to a different school. Therefore, in total, about 16 percent of teachers were not retained in their school from one year to the next. Similarly, about 18 percent of principals were not retained in their school between 2015/16 and 2016/17 (Goldring & Taie, 2018).

Education leaders and policymakers in Montana have raised concerns about educator mobility and attrition, particularly their associated costs and the negative impacts on school culture and student learning (Miller, 2013).

Most recent research on educator mobility uses the terms "stayer," "mover," and "leaver" to define outcomes (Goldring, Taie, & Riddles, 2014; Hanson & Yoon, 2018; Lazarev et al., 2017; Lochmiller, Adachi, Chesnut, & Johnson, 2016; Sullivan et al., 2017). These outcomes may not fully capture the different patterns of mobility in Montana, however. When school systems are small and located in rural-remote areas, educators may work in more than one position. For example, even when an educator stays in the same school system from year to year, they may work as a teacher and school counselor one year, a teacher and administrator the next, and so on. To address these complexities, this study defines mobility by both place (the movement from one school system to another school system) and position (the change in position both within and between school systems from one year to the next) (box 1).

Box 1. Definition of key terms

- **School system:** The Montana Office of Public Instruction provided school system identifiers, which combine all districts and legal entities (schools) operating within a single city or town and/or building into a single school system identifier.
- **Stayer:** Individual stayed in the same school system and position in the following year.
- **Position mover:** Individual stayed in the same school system but changed positions.
- **Place mover:** Individual continued in the same position but moved to a different school system.
- **Position and place mover:** Individual changed both position and school system.
- **Leaver:** Individual left the public education system.
- **Retention:** Remaining in the same school system and position in the following year.
- **Mobility:** Moving between positions or school systems.
- **Attrition:** Departing from the public education system.
- **All positions:** Teachers, administrators, specialists, and other licensed professionals.
- **Shortage subject areas:** The U.S. Department of Education designates teacher shortage subject areas. Montana had 12 teacher shortage subject areas in 2017/18, including art, career and technical education, English, mathematics, music, school counselor, school librarian, school psychologist, science, social studies, special education, and world languages.

What this study examined

This study was conducted at the request of the Montana Rural Recruitment and Retention Task Force. Members of the task force—including policymakers, administrators, college deans, and others—are particularly concerned about how educator mobility and attrition are impacting the state's rural communities. This is the first study to use Montana statewide administrative data to examine the degree of educator shortages in the state and the extent to which educators stay at their position and school system, move to a different position or school system, or leave the Montana public education system. This study also examines the extent to which teachers and principals were employed in multiple positions within one or multiple school systems in 2016/17—a situation that may signal shortages, particularly in rural areas that have less access to qualified applicants.

This study addressed three main questions and three related sub-questions:

1. ***What is the extent of educator shortages in the state in 2017/18?***
    a. How do educator shortage patterns vary by characteristics of school systems?
2. ***To what extent did educators stay in their position and school system, move to a different position within the school system, move to a different school system, or leave the public education system between 2016/17 and 2017/18?***
    a. How do educators' decisions to stay, move, or leave school systems and/or positions vary by the characteristics of educators and school systems?
3. ***To what extent were teachers and principals in Montana employed in multiple roles within their school systems and/or within multiple school systems in 2016/17?***
    a. How did patterns in holding multiple roles differ by the characteristics of school systems?

At the request of task force members and other Montana stakeholders, we also conducted a supplemental analysis of educator survey data to examine respondents' intended mobility, factors associated with accepting their current position, and—for administrators—the top barriers to hiring teachers. Findings from this analysis are provided in appendix C. The data sources, sample, and methods used to conduct this study are shown below (box 2).

Box 2. Data and analysis methods

Data sources. This study primarily used Terms of Employment, Accreditation, and Master Schedule data, which includes de-identified data about educators from 2016/17 to 2017/18 and was provided by the Montana Office of Public Instruction. Publicly available data from U.S. Department of Education Title II reports provided information about teacher preparation program enrollment and completion from 2008/09 to 2014/15, the most recent data available. Another publicly available data source is the National Center for Education Statistics, which includes data on school locale, enrollment numbers, and student demographic and income information from the 2016/17 school year in Montana. Lastly, the Montana Educator Survey includes information about professional characteristics and the perceptions of teachers, principals, and superintendents in the state. For further description of the variables and related terminology, see appendix A.

Sample. This study includes teachers and principals working at Montana K–12 public schools from 2016/17 to 2017/18. There are 821 public schools and 486 school districts. Districts include elementary districts, high school districts, and combined K–12 districts. Because more than one district often operates in the same building and shares the same superintendent, this study uses "school system" as the unit of analysis (see box 1 on page 4). School systems include all districts and schools that share the same building, town, or city. Montana has 312 school systems.

Methods. The research team computed frequencies, percentages, and averages to describe educators' retention and mobility patterns. We highlighted the findings in which differences between groups are equal to or greater than 5 percentage points as a criterion for determining whether the differences are meaningful.

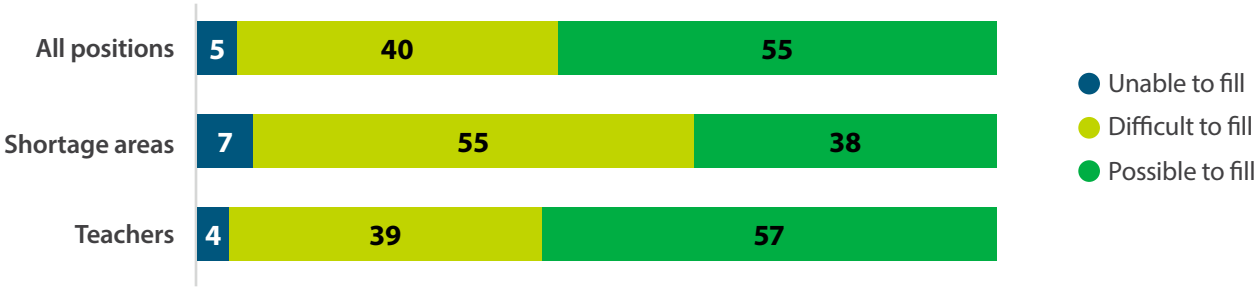
Findings: Educator shortages in Montana

Each fall, the Montana Office of Public Instruction collects data from district administrators about open positions, including the number of full-time equivalent vacancies, position type, and subject. The state also collects information on the challenges in filling vacancies for various positions on a three-point scale: unable to fill (could not hire any qualified applicants), difficult to fill (could not attract a full pool of four to five qualified applicants), and possible to fill (no challenges in filling position). Position types include teachers, specialists, administrators, and other licensed professionals. This section examines educator shortages in Montana by identifying the extent to which administrators found that positions were difficult to fill or are unable to fill, with the analysis conducted both statewide and by characteristics of school systems using the Terms of Employment, Accreditation, and Master Schedule data.

In the 2017/18 school year, district administrators in Montana reported that 62 percent of positions in shortage subject areas, such as math and science, were difficult to fill or unable to be filled

Montana school systems reported that they found it difficult to fill 40 percent of all positions, including teachers, specialists, and other licensed professional positions. An additional 5 percent of positions were unable to be filled, indicating that across the state nearly half of all positions were experiencing a shortage of qualified applicants (figure 2). For the 12 subject areas[4] with known shortages (see box 1), administrators reported that 55 percent were difficult to fill and 7 percent were unable to be filled. In teaching positions, 4 percent were unable to be filled, and 39 percent were difficult to fill.

Figure 2. Montana school systems found it difficult or were unable to fill 45 percent of the vacancies in all positions in 2017/18 (percent)



Note: All positions includes teachers, specialists, administrators, and other licensed professionals.

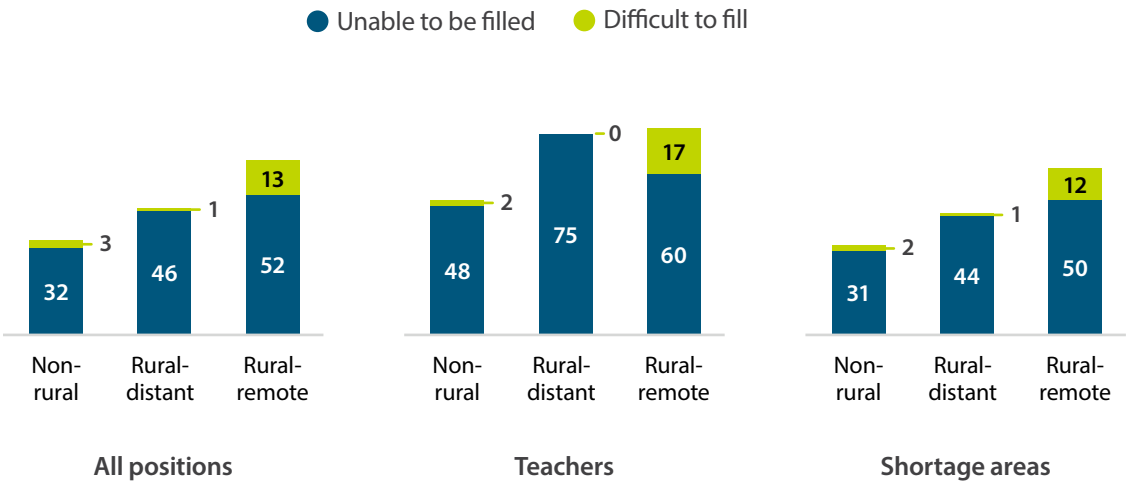
Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2017/18 school year.

[4] Art, career and technical education, English, mathematics, music, school counselor, school librarian, school psychologist, science, social studies, special education, and world languages (Cross, 2017).

In the 2017/18 school year, rural school system administrators reported a higher percentage of positions as difficult to fill or unable to be filled, as compared to non-rural school system administrators

Based on the information related to full-time equivalent vacancies, the severity of educator shortages varied by location. Rural-remote school systems had the highest percentage of all positions that were difficult to fill or unable to be filled (65 percent, combined) compared to rural-distant/fringe (47 percent) and non-rural (35 percent) school systems in 2017/18 (figure 3). Similarly, school systems in rural-remote areas were the most affected by shortages in teaching positions and when trying to fill positions in shortage areas.

Figure 3. The percentage of all positions that were difficult to fill or unable to be filled was higher in rural school systems than in non-rural school systems in 2017/18 (percent)

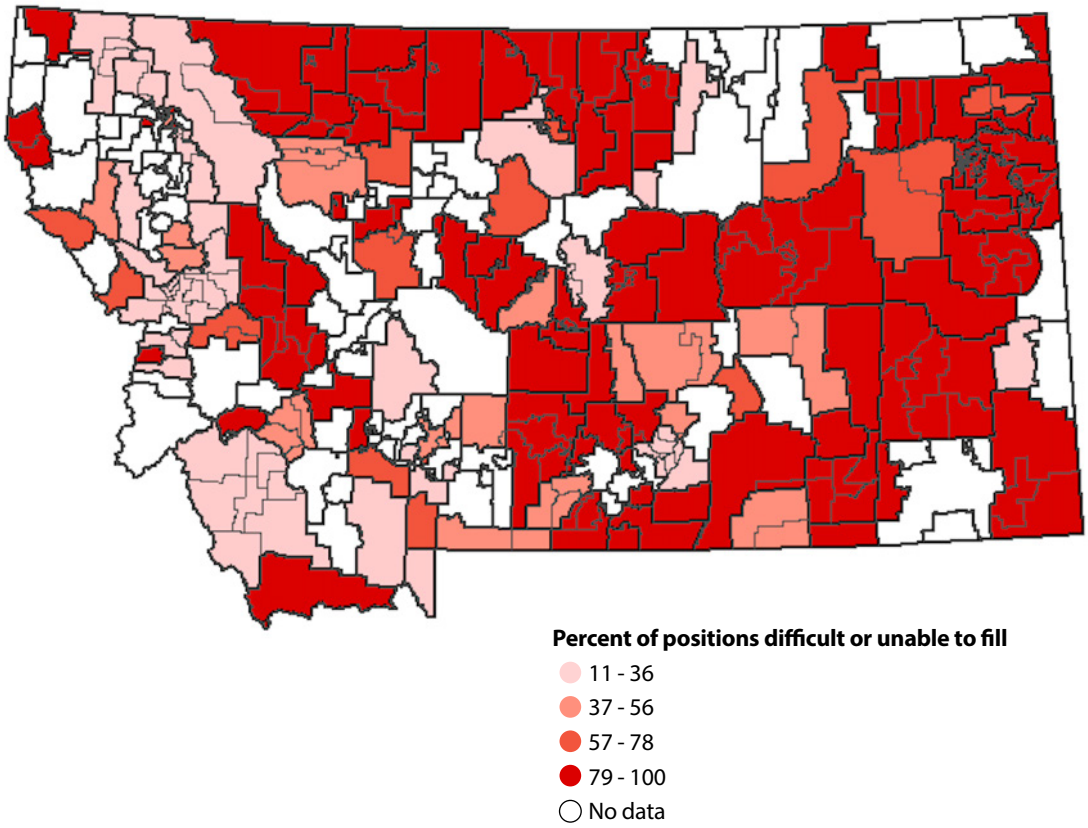


Note: All positions includes teachers, specialists, administrators, and other licensed professionals.

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2017/18 school year and the Common Core of Data for the 2016/17 school year.

There were also differences in educator shortages by geographic region of the state, as indicated in the map on the following page (figure 4 and table B2). The map displays the percentage of positions that were designated as difficult to fill or unable to be filled by school system in Montana. School systems that had the highest percentage of teaching positions that were difficult to fill or unable to be filled in 2017/18 (greater than 79 percent, as indicated by the darkest red shade) were concentrated in the Southeast and Northeast regions of the state—that is, near the Crow and Northern Cheyenne reservations and Fort Peck Indian Reservation, respectively. Other areas with a high concentration of positions that were difficult to fill or unable to be filled included the Glacier, Hill, Liberty, Richland, and Toole school systems, all of which are designated as rural-remote.

Figure 4. Rural-remote school systems struggled to fill teaching positions in the 2017/18 school year



Note: The outlines are school systems in Montana.

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2017/18 school year and the Common Core of Data for the 2016/17 school year.

Additional analysis shows that smaller school systems had a larger proportion of shortages than larger school systems (see table B3 in appendix B). Among class AA school systems (i.e., a high school enrollment of 779 or more students), the percentage of all positions that were difficult to fill or unable to be filled was 17 percent, while class C school systems (i.e., a high school enrollment of fewer than 107 students) reported that 71 percent of their positions were difficult to fill or unable to be filled.

Findings: Educator mobility and attrition in Montana

In the 2017/18 school year, 86 percent of teachers and 87 percent of principals in Montana returned to the same position and school system they were working in the previous school year

Among teachers who taught in Montana in 2016/17, 86 percent returned as teachers to the school system in which they taught the previous year. In addition, 3 percent of teachers stayed in teaching and moved to a different school system, 1 percent of teachers stayed in the school system but changed position, and 9 percent of teachers left the Montana public education system altogether.

Among principals who worked in Montana school systems in the 2016/17 school year, 87 percent remained as a principal in the same school system in the following year. An additional 2 percent moved to a different school system in the 2017/18 school year, 1 percent stayed in the school system but changed positions, and 10 percent of principals left the Montana public education system (table 1).

Table 1. Teacher and principal mobility across their position and school system between 2016/17 and 2017/18 (percent)

Mobility		Teacher	Principal
Stayer		86	87
Mover	Position mover	1	1
	Place mover	3	2
	Position and place mover	0	0
Leaver		9	10
Total		100 (N = 11,010)	100 (N = 477)

Notes: The total number of teachers exceeds the number of individuals teaching in public schools in Montana (10,827) because some individuals taught in multiple schools; thus, they were counted as unique teachers. Similarly, the total number of principals exceeds the number of individuals who were principals in Montana (472) because some principals worked in more than one school system as a principal. Percentages may not sum to 100 because of rounding.

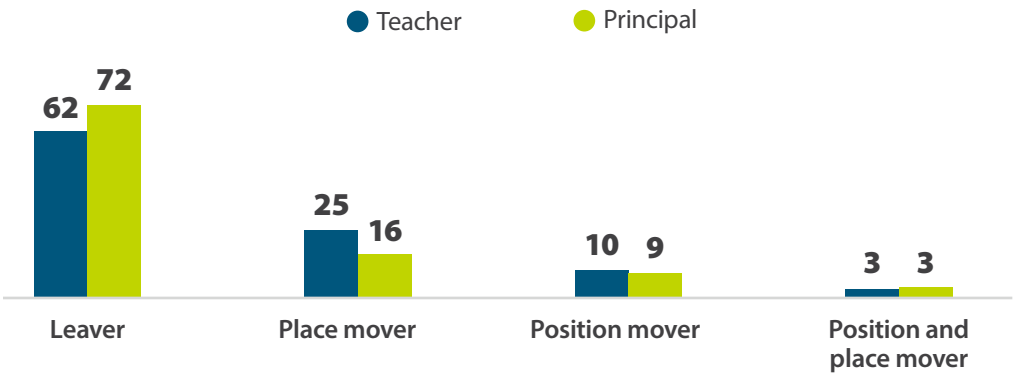
Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years.

Among educators who did not stay in their position and school system from 2016/17 to 2017/18, more than half left the Montana public education system

About 14 percent of Montana teachers (or 1,514 teachers) did not stay in their position and school system in 2017/18. Of those 1,514 teachers, 62 percent left the public education system in Montana. An additional 25 percent of teachers left their previous school system to move to a different school system, 10 percent stayed in their school system but changed position, and 3 percent switched both school system and position in the 2017/18 school year (figure 5 and table B4 in appendix B).[5]

For principals who did not stay in their position and school system in 2017/18, about 72 percent left the Montana public education system. Meanwhile, 16 percent moved to a different school system, 9 percent moved to a different position, and 3 percent changed both school system and position (figure 5 and table B4 in appendix B).[6]

Figure 5. Among educators who did not stay in their position and school system, more than half left the Montana public education system between 2016/17 and 2017/18 (percent)



Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years.

[5] There are 44 teachers who moved both position and place from 2016/17 to 2017/18. This is less than 1 percent of all teacher stayers and leavers (44 of 11,010 = 0 percent), as shown in table 1, and is 3 percent of leavers (44 of 1,514 = 3 percent), as shown in figure 5 and in table B4 in appendix B.

[6] There are two principals who moved both position and place from 2016/17 to 2017/18. This is less than 1 percent of all principal stayers and leavers (2 of 477 = 0 percent), as shown in table 1, and is 3 percent of all principal leavers (2 of 64 = 3 percent), as shown in figure 5 and in table B4 in appendix B.

The percentage of teachers who stayed in their position and school system was higher in school systems with a below-average proportion of American Indian students, school systems located in non-rural areas, and school systems with higher enrollment

A substantial body of research suggests that the retention decisions of teachers may be influenced by their salary and school-level characteristics, such as locale, poverty, and students' demographic characteristics (Loeb, Darling-Hammond, & Luczak, 2005; McKibben, 2013). We examined whether various characteristics of teachers and school systems were related to their retention decision (see appendix B for the full list of variables), and we highlight differences that are equal to or greater than 5 percentage points. We found that teacher age, teacher salary, the percentage of American Indian students in a school system, school system locale, and school system size had meaningful relationships with teacher retention in Montana from 2016/17 to 2017/18 (figure 6).

We describe these findings below, with two exceptions. We do not describe the findings related to age because this relationship is harder to interpret, since it is likely conflated with teacher retirement. We also do not describe the findings related to salary because this relationship is harder to interpret due to the close relationship between salary and teacher experience, a variable for which we did not have data.

Percentage of American Indian students in a school system

Teachers in school systems with below-average proportions of American Indian students (11.2 percent) had significantly higher retention than teachers in school systems with more than 50 percent American Indian students. In school systems with less than 11.2 percent American Indian students, 87 percent of teachers remained in the same position and same school system the following year. In school systems with more than 50 percent American Indian students, 78 percent of teachers stayed in the same position and school system.

School system locale

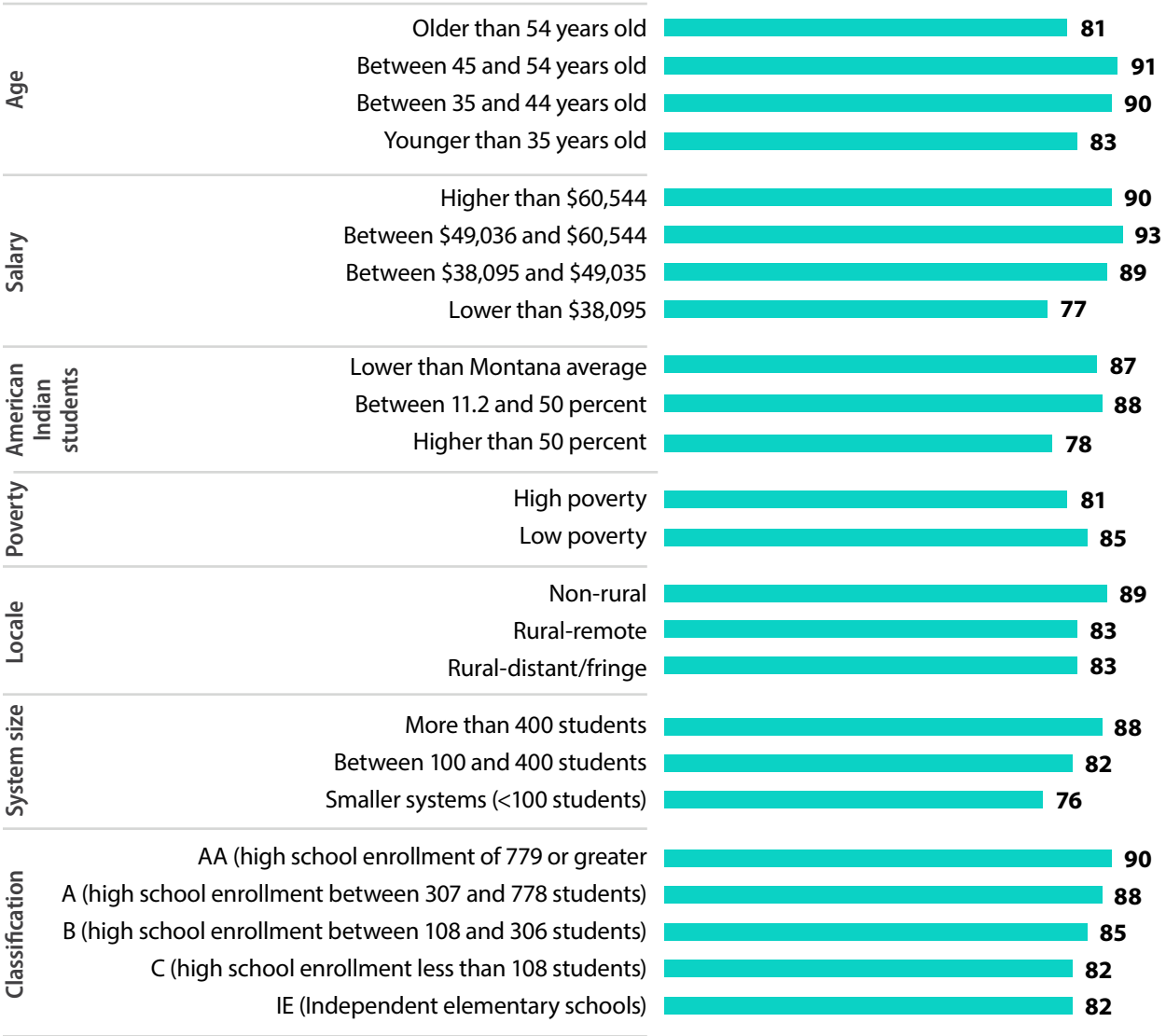
Non-rural school systems had higher teacher retention than rural school systems. In 2016/17, about 83 percent of teachers who worked in school systems located in rural-remote or rural-distant/fringe areas continued to teach in the same position and school system, compared to about 89 percent of teachers in non-rural school systems.

School system size

Larger school systems had higher teacher retention than smaller school systems. Among school systems serving fewer than 100 students, 76 percent of teachers remained at the same position and school system the following year, while 88 percent of teachers who worked in school systems serving more than 400 students taught in the same position

and school system. In addition, schools in classification categories with larger high school enrollments had higher teacher retention than schools in classification categories with lower high school enrollments. (For further description, see table B5 in appendix B).

Figure 6. The percentage of teacher stayers from 2016/17 to 2017/18 varied by characteristics of teachers and school systems (percent)

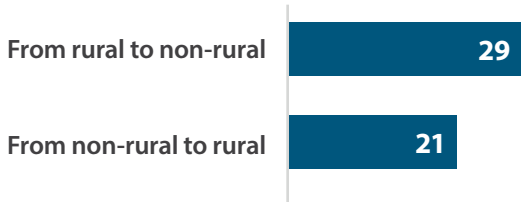


Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years and the Common Core of Data for the 2016/17 school year.

Among teachers who moved between school systems, more teachers moved from rural to non-rural areas (29 percent) than from non-rural to rural areas (21 percent), indicating that rural school systems lost teachers to non-rural school systems from 2016/17 to 2017/18

We further examined mobility patterns to establish where educators were moving. For this analysis we combined rural-remote and rural-distant/fringe school systems into a single rural category. Among teachers who moved between school systems from 2016/17 to 2017/18 (i.e., both place movers, and position and place movers), 29 percent of teachers moved out of a rural school system into a non-rural school system, and 21 percent of teachers moved into a rural school system from a non-rural school system (figure 7). These findings, in addition to the findings that show mobility is higher in rural areas, indicate that rural school systems lost teachers to non-rural school systems in the years we analyzed.

Figure 7. Among teachers who moved between school systems from 2016/17 to 2017/18, more teachers moved from a rural to a non-rural school system (percent)



Note: This analysis combines rural-remote and rural-distant/fringe into the single category of rural.

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years and the Common Core of Data for the 2016/17 school year.

The percentage of principals who stayed in their position and school system was higher in school systems with a below-average proportion of American Indian students, those with lower levels of poverty, those with higher enrollment, and those located in non-rural areas

For principal retention, the findings are consistent with those for teachers, except that principals are also more likely to stay in schools with lower levels of poverty. We found meaningful differences in subgroups for age, the percentage of American Indian students, poverty, school system locale, and school system size (figure 8). We do not highlight the findings related to age because this relationship is likely conflated with principal retirement. Principals' salary data are not available, so we did not examine this factor.

Percentage of American Indian students in a school system

In school systems with less than 11.2 percent American Indian students, 88 percent of principals remained in the same position and school system, whereas in school systems with more than 50 percent American Indian students, 73 percent of principals stayed in the same position and school system the following year.

School system poverty

A higher proportion of principals stayed in their position and school system in low-poverty school systems (88 percent) compared to high-poverty school systems (81 percent).

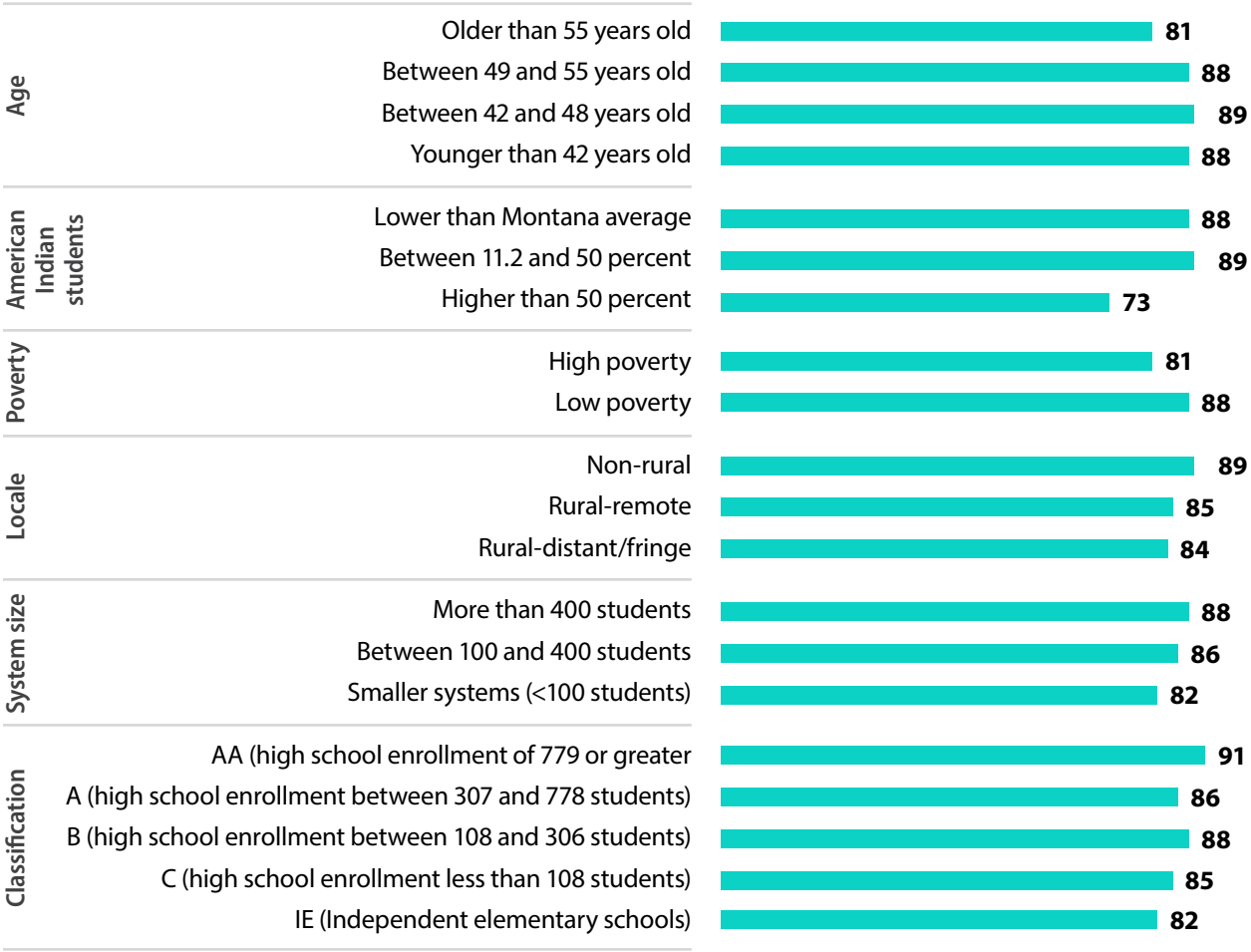
School system locale

Non-rural systems had higher principal retention than rural systems. In 2016/17, 84 percent of principals who worked in systems located in rural-distant/fringe areas stayed in their position and school system, compared to about 89 percent of principals in non-rural school systems.

School system size

Larger school systems had higher principal retention than smaller school systems. Among systems serving fewer than 100 students, 82 percent of principals remained at the same position and school system the next year, while 88 percent of principals who worked in school systems serving more than 400 students remained in the same position and system. Additionally, school systems with larger high school enrollments (779 or greater) had higher principal retention (91 percent) than school systems with smaller enrollment (85 percent in school systems with less than 107 students) (For further description, see table B6 in appendix B).

Figure 8. The percentage of principal stayers from 2016/17 to 2017/18 varied by the percentage of characteristics of principals and school systems (percent)



Note: Differences in percentages within categories are equal to or greater than 5 percentage points.

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years and the Common Core of Data for the 2016/17 school year.

Findings: Multiple educator roles

In the 2016/17 school year, 29 percent of Montana teachers and 24 percent of principals held multiple positions. This percentage was higher in school systems located in the most remote rural areas, where 36 percent of teachers and 40 percent of principals held more than one position.

Findings show that 97 percent of Montana teachers worked in a single school system in the 2016/17 school year. However, 29 percent of teachers and 24 percent of principals held multiple roles within their school system, such as a coach, facilitator, or administrator role, in addition to their teaching or principal position (table 2).

Table 2. Approximately a quarter of teachers and principals in Montana served in more than one position

	Teacher (percent)	Principal (percent)
Number of positions		
One	71	76
More than one	29	24
Number of school systems		
One	97	98
More than one	3	2

Note: Additional positions that teachers held included administrator, assistant principal, athletic trainer and director, coach, coordinator, facilitator, librarian, media specialist, paraprofessional, principal, school counselor, and short- and long-term substitute teacher. Additional positions that principals held included assistant principal, athletic director, coach, coordinator, facilitator, librarian, media specialist, school counselor, and teacher.

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years.

Educators who worked in more than one school system

Educators who worked in more than one school system were even more likely to hold more than one position. All principals (100 percent) and 89 percent of teachers who worked in more than one school system held multiple positions (see table B7 in appendix B). In addition, the proportion of principal stayers who held more than one position (26 percent) was larger than the proportion of principal leavers who held more than one position (11 percent). Similarly, the proportion of teacher stayers who held more than one position (29 percent) was larger than the proportion of teacher leavers who held more than one position (20 percent) (see table B8 in appendix B).

Educators who worked in rural-remote school systems

Educators in rural-remote school systems were more likely to hold multiple positions than educators in non-rural school systems. Among teachers who taught in rural-remote school systems in the 2016/17 school year, 36 percent held more than one position, compared to 26 percent of teachers in non-rural school systems. Among principals who worked in non-rural school systems in the 2016/17 school year, 14 percent held multiple positions, including a teaching or non-teaching position, whereas in rural-remote school systems 40 percent of principals held multiple positions (table 3).

Table 3. Teachers and principals in rural-remote areas were more likely than their peers in non-rural areas to serve in more than one position

	Non-rural		Rural-distant/fringe		Rural-remote	
Number of positions	Teacher (percent)	Principal (percent)	Teacher (percent)	Principal (percent)	Teacher (percent)	Principal (percent)
One	74	86	73	82	64	60
More than one	26	14	27	18	36	40
Total	**100**	**100**	**100**	**100**	**100**	**100**

Note: Additional positions that teachers held included administrator, assistant principal, athletic trainer and director, coach, coordinator, facilitator, librarian, media consultant, paraprofessional, principal, school counselor, and short- and long-term substitute teacher. Additional positions that principals held included assistant principal, athletic director, coach, coordinator, facilitator, librarian, media specialist, school counselor, and teacher.

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years and the Common Core of Data for the 2016/17 school year.

Implications

This study has several implications for addressing educator shortages in Montana and other states with similar demographics.

Policymakers may want to explore strategies for increasing the supply of qualified teachers and reducing barriers to obtaining a teaching certification

Given the high percentage of educator positions that were difficult to fill or unable to be filled in the 2017/18 school year, Montana policymakers may want to consider ways to increase the supply of qualified teachers. This may include creating multiple pathways into the teaching field by supporting career and technical education teacher pathway initiatives and/or grow-your-own teacher programs that help paraprofessionals and other teachers with limited certification become fully certified. Another consideration is to better understand the possible barriers to obtaining certification in Montana, such as certification testing, teaching certification requirements, and teacher license reciprocity.

Policymakers may want to target resources and supports to rural school systems and school systems with a high percentage of American Indian students

Rural-remote school systems in Montana had the highest percentage of teaching positions that were difficult to fill or unable to be filled (82 percent, combined). This corroborates earlier evidence that educator shortages are more severe in rural areas nationally (Monk, 2007). To attract qualified teacher candidates to rural school systems, supports might include mentoring programs and incentives such as housing subsidies and loan forgiveness programs (Feng & Sass, 2018). Another approach could include promoting teachers through local community- and relationship-based teacher preparation programs, such as grow-your-own teacher initiatives (Kawakami et al., 2011). These efforts may increase the number of American Indian teachers from local communities, which could be beneficial for school systems that serve a high percentage of American Indian students.

While the overall retention rate in Montana is slightly higher than the national average (84 percent of teachers in 2012/13 and 82 percent of principals in 2016/17) (Goldring & Taie, 2018; Goldring et al., 2014), rural areas have lower teacher retention rates compared to non-rural school systems, and rural school systems lost teachers to non-rural school systems. This issue is acute, given that 86 percent of Montana school systems serve students located in rural areas.

In addition, the study found lower retention rates for both teachers and principals in school systems serving more than 50 percent of American Indian students. To improve retention, Montana education leaders may want to gain a better understanding of the challenges teachers and principals face in schools with high percentages of American Indian students, and they may want to consider incentives, professional development, and/or opportunities for upward career pathways. Research also suggests that teacher mentoring programs and supporting teacher engagement with students and community members may lead to higher teacher efficacy and retention in communities with a high percentage of students of color (Adam & Woods, 2015; Kawakami, Keahiolalo-Karasuda, Carroll, & King, 2011). For example, in Alaska, a mentoring program in rural districts that predominantly serve Alaska Native students has increased average teacher retention rates from 67 percent to 77 percent among new teachers over six years (Adams & Woods, 2015).

Given the high percentage of Montana educators who held multiple roles within one or more school systems, Montana educator shortages may be underreported

While some school systems may only need educators to fill part-time positions, there is also a possibility that educator shortage problems are more severe than what is directly reported by the percentage of positions that are difficult to fill or unable to be filled in Montana. Full labor allocation may not be accurately reflected because many Montana educators are filling multiple roles. For example, if a teacher is filling both a librarian and a teaching position in a school system, even if the school system needs a full-time librarian and a full-time teacher, there is the possibility that neither position is fully designated as a shortage in the school system.

The large number of educators holding multiple positions is not surprising given that 76 percent of rural school systems serve fewer than 100 students in Montana. According to the Standards of Accreditation in Montana, school systems with nine or fewer full-time equivalent licensed staff members may use a supervising teacher and county superintendent to satisfy the principal requirement. Employing staff members in multiple positions may provide the school system with greater budget flexibility. A recent study found that teachers in rural school districts who held more responsibilities were more likely to be retained in their school in the following year due to higher total compensation (Lazarev et al., 2017). However, educators who hold multiple positions are responsible for a broader set of student needs and may be more likely to burn out than teachers who hold only one position.

Study findings draw attention to the need for careful collection and analysis of the educator workforce data, particularly in areas with large rural populations

The study has potential national implications for the type of data that are necessary to track educator shortages in small schools in rural areas. Individual schools and districts may not constitute the accurate unit of analysis for understanding educator mobility and retention in rural-remote areas like Montana. For example, Montana teachers may look like part-time teachers working in multiple schools even if they are full-time teachers across multiple districts working within one physical building (school system). Entities that are collecting data on teachers and principals in rural areas should work carefully to address these issues to accurately measure educator mobility and shortages.

Limitations

This study has three primary limitations. First, we examined the mobility of teachers and principals between two school years. Therefore, the results cannot address changes in mobility patterns that may have taken place over a longer period. Second, some of the characteristics used in the analysis, such as size of the school system, school classification, and rurality, may be highly correlated with each other. This means that the findings we present across subgroups could possibly be driven by one underlying population. The subgroups discussed were chosen in partnership with stakeholders who are interested in these findings, despite their limitations. Third, it is possible that the available characteristics from the data we analyzed do not address all the key factors relevant to educators' retention and mobility. These study findings should not be interpreted as providing causal evidence about strategies for recruiting, hiring, and retaining educators.

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Appendix A. Data sources and related terms

We used four data sources to conduct this study: Terms of Employment, Accreditation, and Master Schedule; Common Core of Data; Title II Higher Education Act; and the Montana Educator Survey.

Terms of Employment, Accreditation, and Master Schedule data

The Montana Office of Public Instruction (OPI) provided de-identified data about educators linked to school, district, and school system IDs from the 2016/17 to 2017/18 school years, and the records are linked across time. There are no missing data for teachers' age, principals' age, and teacher salary. Each fall, district administrators report to OPI on the number of vacancies that they were or were not able to fill. In 2017/18, of the 2,935 records of these vacancy reports that were collected, 39 records (1 percent) were missing.

We used the following categories and definitions for the key variables in the study:

- **Teacher age**
  - Bottom 25 percent of teacher age in Montana = younger than 35 years old.
  - Second smallest quartile age in Montana = between 35 and 44 years old.
  - Third smallest quartile age in Montana = between 45 and 54 years old.
  - Top 25 percent of teacher age in Montana = older than 54 years old.
- **Principal age**
  - Bottom 25 percent of teacher age in Montana = younger than 42 years old.
  - Second smallest quartile age in Montana = between 42 and 48 years old.
  - Third smallest quartile age in Montana = between 49 and 55 years old.
  - Top 25 percent of teacher age in Montana = older than 55 years old.
- **Teacher salary**
  - Bottom 25 percent of teacher salary in Montana within the school year = lower than $38,095.
  - Second smallest quartile teacher salary in Montana = between $38,095 and $49,035.
  - Third smallest quartile teacher salary in Montana = between $49,036 and $60,544.
  - Top 25 percent of teacher salary in Montana within the school year = higher than $60,544.

- **Vacancy reports:** Information on the challenges in filling vacancies for various positions, as rated on a three-point scale based on the number of vacancies that school systems were or were not able to fill.
  - ***Unable to fill:*** School systems could not hire any qualified applicants.
  - ***Difficult to fill:*** School systems could not attract a full pool of four to five qualified applicants.
  - ***Possible to fill:*** School systems had no challenges in filling position.

Common Core of Data

These publicly available data come from the U.S. Department of Education's National Center for Education Statistics (NCES). These data provided school locale, enrollment numbers, and student demographic and income information from 2015/16 and 2016/17. We used the following categories and definitions for key variables in the study:

- **Locale**
  Based on NCES locale codes, we created three categories:
  - ***Rural-remote:*** A census-defined rural territory that is more than 25 miles from an urbanized area and more than 10 miles from an urban cluster (NCES code 43).
  - ***Rural-distant/fringe:*** Rural-distant is a census-defined rural territory that is more than 5 miles but less than or equal to 25 miles from an urbanized area, as well as rural territory that is more than 2.5 miles but less than or equal to 10 miles from an urban cluster (NCES code 42). Rural-fringe is a census-defined rural territory that is less than or equal to 5 miles from an urbanized area, as well as a rural territory that is less than or equal to 2.5 miles from an urban cluster (NCES code 41).
  - ***Non-rural:*** All urban, town, and suburban areas (NCES codes 11, 12, 13, 21, 23, 31, 32, 33).
- **Poverty**
  - Low-poverty school systems serve less than 25 percent economically disadvantaged students.
  - High-poverty school systems serve at least 75 percent economically disadvantaged students.
- **School system size**
  - Small-size enrollment = fewer than 100 students.
  - Medium-size enrollment = between 100 and 400 students.
  - Large-size enrollment = more than 400 students.

- School classification: We also used school classification to categorize school systems by enrollment size. School classification is a designation used by the Montana High School Association for interschool competition. It is an indicator of school size and governance structures and is more meaningful to Montana stakeholders than size alone. Classifications are based on enrollment of the school district within a school system as follows:
  - Class AA: high school enrollment of 779 or greater.
  - Class A: high school enrollment between 307 and 778 students.
  - Class B: high school enrollment between 108 and 306 students.
  - Class C: high school enrollment less than 108 students.
  - Independent elementary (IE) schools.
- **American Indian students**
  - Average proportion of American Indian students in Montana districts = 11.2 percent.

Title II Higher Education Act data

These data come from the U.S. Department of Education and are publicly available. They provided information about teacher preparation program completion from 2012/13 to 2015/16, the most recent year of data available.

Montana Educator Survey

The Montana Educator Survey provided data on descriptions of professional characteristics and perceptions of teachers, principals, and superintendents in the state. The Center for Research on Rural Education (CRRE) at Montana State University administered a teacher survey and an administrator survey (for principals and superintendents) to the full population of teachers, principals, and superintendents in the state. The survey response rate was 17 percent for teachers, 20 percent for principals, and 58 percent for superintendents, and respondents were not representative of all Montana school systems. The survey data findings are included in appendix C as supplemental information.

Appendix B. Data on educator and student demographics, educator shortages, and related issues

This appendix provides additional information about the characteristics of students and educators in Montana, the extent of educator shortages, retention rates of teachers and principals by various types of school systems, and the number of positions among educators who worked in one school system and more than one school system.

Table B1. Demographic characteristics of students and educators, by locale

Characteristics	Locale			
	Non-rural school systems	Rural-distant/ fringe school systems	Rural-remote school systems	All school systems
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Teacher characteristics				
Number of teachers	6,540	1,515	2,769	10,827
Salary (dollars)	53,306	43,647	43,520	49,529
	(16,131)	(13,969)	(14,543)	(1,172)
Age	44	44	45	44
	(11)	(12)	(12)	(12)
Principal characteristics				
Number of principals	215	82	175	472
Age	46	45	47	46
	(13)	(13)	(14)	(13)
Student characteristics				
Percentage of students who qualified for free or reduced-price lunch	47	37	46	45
	(19)	(26)	(32)	(25)
Percentage of American Indian students	11	8	17	13
	(21)	(18)	(32)	(24)
Percentage of Asian students	1	1	0	1
	(1)	(3)	(1)	(1)
Percentage of Hispanic students	5	4	3	4
	(2)	(2)	(3)	(2)
Percentage of Black students	1	1	1	1
	(1)	(1)	(1)	(1)

Characteristics	Locale			
	Non-rural school systems	Rural-distant/ fringe school systems	Rural-remote school systems	All school systems
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Percentage of White students	79	84	76	79
	(21)	(20)	(31)	(24)
Percentage of Hawaiian students	0	0	0	0
	(0)	(1)	(0)	(0)
Percentage of students identifying two or more races/ethnicities	3	3	3	3
	(3)	(3)	(4)	(3)

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 school year and the Common Core of Data for the 2016/17 school year.

Table B2. Percentage of full-time equivalent positions that were difficult to fill or unable to be filled in 2017/18, by region (percent)

Position		Region								
		4 Rivers	Central	Hi-Line	North Central	North West	Northeast	South central	Southeast	Western
Difficult or unable to fill		Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
All positions	Difficult to fill	23	55	63	41	24	74	40	67	32
	Unable to be filled	3	10	4	6	4	18	4	14	2
Shortage areas	Difficult to fill	37	62	80	50	37	72	60	87	52
	Unable to be filled	5	15	7	10	4	22	4	11	2
Teachers	Difficult to fill	20	60	63	41	22	77	40	69	28
	Unable to be filled	2	7	4	6	2	15	3	14	1

Note: All positions includes teachers, specialists, administrators, and other licensed professionals. Montana had 12 teacher shortage subject areas in 2017/18: art, career and technical education, English, mathematics, music, school counselor, school librarian, school psychologist, science, social studies, special education, and world language.

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years.

Table B3. Percentage of full-time equivalent positions that were difficult to fill or unable to be filled in 2017/18, by school system classification (percent)

Position		Classification				
		AA	A	B	C	IE
Difficult or unable to fill		Mean	Mean	Mean	Mean	Mean
All positions	Difficult to fill	17	55	51	60	38
	Unable to be filled	0	6	11	11	4
Shortage areas	Difficult to fill	35	63	69	64	68
	Unable to be filled	0	5	7	17	2
Teachers	Difficult to fill	15	57	48	60	37
	Unable to be filled	0	3	10	11	2

Note: All positions includes teachers, specialists, administrators, and other licensed professionals. Montana had 12 teacher shortage subject areas in 2017/18: art, career and technical education, English, mathematics, music, school counselor, school librarian, school psychologist, science, social studies, special education, and world language.

Note: Classifications are based on enrollment of the high school district within a school system, as follows:

- Class AA: high school enrollment of 779 or greater
- Class A: high school enrollment between 307 and 778 students
- Class B: high school enrollment between 108 and 306 students
- Class C: high school enrollment less than 107 students
- Independent elementary schools (IE)

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years.

We examined the teacher and principal mobility among those who did not stay in their position and school system for 2016/17 to 2017/18.

Table B4. Teacher and principal mobility among those who did not stay in their position and school system across their position and school system between 2016/17 and 2017/18 (percent)

Mobility		Teacher	Principal
Mover	Position mover	10	9
	Place mover	25	16
	Position and place mover	3	3
Leaver		62	72
Total		100 (N = 1,514)	100 (N = 64)

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years.

We also examined the differences in teacher and principal retention between groups (tables B5 and B6).

Table B5. Differences in teacher retention by characteristics of teachers and school systems from 2016/17 to 2017/18

Characteristics	Groups being compared	Mean difference (Percent)
Age	Younger than 35 years old vs. between 35 and 44 years old	7
	Younger than 35 years old vs. between 45 and 54 years old	8
	Younger than 35 years old vs. older than 54 years olde	2
	Between 35 and 44 years old vs. between 45 and 54 years old	0
	Between 35 and 44 years old vs. older than 54 years old	9
	Between 45 and 54 years old vs. older than 54 years old	10
Salary	Lowest quartile salary vs. second lowest quartile salary	12
	Lowest quartile salary vs. third lowest quartile salary	16
	Lowest quartile salary vs. highest quartile salary	13
	Second lowest quartile salary vs. third lowest quartile salary	4
	Second lowest quartile salary vs. highest quartile salary	1
	Third lowest quartile salary vs. highest quartile salary	3
School system size	Fewer than 100 students vs. between 100 and 400 students	6
	Fewer than 100 students vs. more than 400 students	12
	Between 100 and 400 students vs. more than 400 students	6
Poverty	Low poverty vs. high poverty[1]	4
Locale	Non-rural vs. rural-distant	6
	Non-rural vs. rural-remote	6
	Rural-distant vs. rural-remote	0
Percentage of American Indian students	Lower than Montana average vs. between 11.2 and 50 percent	1
	Lower than Montana average vs. higher than 50 percent	9
	Between 11.2 and 50 percent vs. higher than 50 percent	10

Characteristics	Groups being compared	Mean difference (Percent)
School system classification	Class AA vs. A	2
	Class AA vs. B	5
	Class AA vs. C	8
	Class AA vs. IE	8
	Class A vs. B	3
	Class A vs. C	6
	Class A vs. IE	6
	Class B vs. C	3
	Class B vs. IE	3
	Class C vs. IE	0

[1] Low-poverty school systems serve less than 25 percent economically disadvantaged students; high-poverty school systems serve at least 75 percent economically disadvantaged students.

Note: Classifications are based on enrollment of the high school district within a school system, as follows:

- Class AA: high school enrollment of 779 or greater
- Class A: high school enrollment between 307 and 778 students
- Class B: high school enrollment between 108 and 306 students
- Class C: high school enrollment less than 107 students
- Independent elementary schools (IE)

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 school year and the Common Core of Data for the 2016/17 school year.

Table B6. Differences in principal retention by characteristics of principal and school systems from 2016/17 to 2017/18

Characteristics	Groups being compared	Mean difference (Percent)
Age	Younger than 42 years old vs. between 42 and 48 years old	1
	Younger than 42 years old vs. between 49 and 55 years old	0
	Younger than 42 years old vs. older than 55 years old	7
	Between 42 and 48 years old vs. between 49 and 55 years old	1
	Between 42 and 48 years old vs. older than 55 years old	8
	Between 49 and 55 years old vs. older than 55 years old	7
School system size	Fewer than 100 students vs. between 100 and 400 students	4
	Fewer than 100 students vs. more than 400 students	6
	Between 100 and 400 students vs. more than 400 students	2
Poverty	Low poverty vs. high poverty[1]	7
Locale	Non-rural vs. rural-distant	5
	Non-rural vs. rural-remote	4
	Rural-distant vs. rural-remote	1

Characteristics	Groups being compared	Mean difference (Percent)
Percentage of American Indian students	Lower than Montana average vs. between 11.2 and 50 percent	1
	Lower than Montana average vs. higher than 50 percent	15
	Between 11.2 and 50 percent vs. higher than 50 percent	16
School classification	Class AA vs. A	5
	Class AA vs. B	3
	Class AA vs. C	6
	Class AA vs. IE	9
	Class A vs. B	2
	Class A vs. C	1
	Class A vs. IE	4
	Class B vs. C	3
	Class B vs. IE	6
	Class C vs. IE	3

[1] Low-poverty school systems serve less than 25 percent economically disadvantaged students; high-poverty school systems serve at least 75 percent economically disadvantaged students.

Note: Classifications are based on enrollment of the high school district within a school system, as follows:

- Class AA: high school enrollment of 779 or greater
- Class A: high school enrollment between 307 and 778 students
- Class B: high school enrollment between 108 and 306 students
- Class C: high school enrollment less than 107 students
- Independent elementary schools (IE)

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 school year and the Common Core of Data for the 2016/17 school year.

Table B7. The percentage of teachers and principals working in one position or more than one position by the number of school systems in which the teacher or principal worked in 2016/17

Number of positions associated in 2016/17	One school system		More than one school system	
	Teacher	Principal	Teacher	Principal
One	73	77	11	0
More than one	27	23	89	100

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years.

Table B8. The percentage of teachers and principals working in one position or more than one position by their retention status in 2017/18

Number of positions associated in 2016/17	All		Stayers		Leavers	
	Teacher	Principal	Teacher	Principal	Teacher	Principal
One	71	76	71	74	80	89
More than one	29	24	29	26	20	11

Source: Authors' analysis of data from the Terms of Employment, Accreditation, and Master Schedule for the 2016/17 and 2017/18 school years.

Appendix C. Findings from the Montana Educator Survey

Teacher, principal, and superintendent perspectives on educator recruitment and retention in Montana

The Center for Research on Rural Education (CRRE) at Montana State University administered a teacher survey and an administrator survey (for principals and superintendents) with support from Regional Educational Laboratory (REL) Northwest. CRRE partnered with the Montana Federation of Public Employees, School Administrators of Montana, and Recruiting Incredible School Educators for Montana to administer the survey to teachers, principals, and superintendents in spring 2018. These same stakeholders requested that REL Northwest analyze the survey data.

CRRE distributed the survey, monitored the response rate, and sent multiple email reminders over a four-week period. The surveys were open from May 2, 2018, to June 30, 2018. The response rate was 17 percent for the teacher survey, 20 percent for the principal survey, and 58 percent for the superintendent survey. The survey findings must be interpreted with great caution, as they are not representative of all educators in Montana due to the low response rates. We found that teachers, principals, and superintendents from non-rural school systems and principals and superintendents in rural-remote school systems were overrepresented in the survey samples (For further description, see tables C7, C8, and C9).

In addition, findings from the analysis of the survey data should not be interpreted as providing causal evidence about strategies for supporting educators. For example, despite statistically significant correlations, there is no evidence to indicate that providing limited-certification teachers with supports will help school systems retain these teachers. Due to the low response rates and the lack of representativeness of the survey sample, these analyses are considered supplemental to the findings presented in the body of the report.

The survey analysis responds to the following research questions.

1. ***What do administrators (principals and superintendents) perceive as the main challenges in recruiting and hiring teachers?***
    a. How do administrators' perceptions about recruiting and hiring challenges vary by school system characteristics?
2. ***What do educators (teachers, principals, superintendents) consider as the main factors that influence their decision to accept their current job?***
    a. To what extent do these factors vary by school system characteristics?
3. ***What percentage of educators intend to stay in their current positions and school systems for the 2018/19 school year?***
    a. To what extent do the differences in educators' intention to stay in their positions and school systems vary by the characteristics of the educator and school system?

We highlight key findings from the survey analysis, focusing on main results and differences across subgroups that are statistically significant:

Administrator perspectives on recruitment challenges

- Principals reported the most common barriers to hiring teachers were having an adequate number of applicants, having an adequate number of applicants with the required endorsement area or licensure, and finding affordable housing for their applicants. These results varied by locale and school classification.
- Superintendents reported the most common barriers to hiring teachers were having adequate funding to offer competitive salaries, having an adequate number of applicants, and finding teachers with the right endorsement area or licensure.

Educators' preferences when choosing positions

- Teachers reported the top three reasons for accepting their position were location, match with grade level and subject area preferences, and salary. These responses varied by locale, school classification, salary, school size, and the percentage of students in the school who qualified for free or reduced-price lunch.
- Principals reported the top three reasons for accepting their position were location, prior experience in the school or district, and salary.
- Superintendents reported the top three reasons for accepting their position were location, district size, and salary.

Montana educators' intention to stay in their position

- We found that 80 percent of teachers, principals, and superintendents reported that they intended to stay in their current position.
- Teachers' intention to stay varied by several factors, including:
  - Experience: Veteran teachers were 20 percentage points more likely to report intending to stay compared to novice teachers.
  - Salary: High-salaried teachers were 17 percentage points more likely to report intending to stay compared to low-salaried teachers.
  - Locale: Teachers in non-rural school systems were 15 percentage points more likely to report intending to stay compared to teachers in rural-remote school systems.
  - School classification: Teachers in class AA school systems were 12 percentage points more likely to report intending to stay compared to teachers in class C school systems.
  - Teachers who perceived the leadership to be supportive were 25 percentage points more likely to report intending to stay compared to teachers who did not perceive the leadership to be supportive, and differences were also observed by overall teacher satisfaction (17 percentage points) and teacher perceived level of influence in the school (12 percentage points) between teachers who reported intending to stay and those who reported intending to leave.
- We found differences by superintendents' years of experience in Montana (veteran superintendents were 28 percentage points more likely to report that they intend to stay compared to novice superintendents) and level of superintendent satisfaction (25 percentage point difference between superintendents who reported intending to stay and those who reported intending to leave).

Variable definitions

We present the definitions of key variables of interest from the teacher survey, focusing on the outcome measures for the research questions and the definitions of variables used in the subgroup analysis (table C1). In addition to these variables, the dataset includes information on the demographic characteristics of the respondents (gender, ethnicity, and age), full/part-time status, years of experience, and information about the school system in which the respondent works (e.g., rurality, size, school classification, Montana Association of School Superintendents [MASS] region).[7]

[7] The Montana Association of School Superintendents (MASS) regions are: 4 Rivers, Central, Hi-Line, North Central, North West, Northeast, Southcentral, Southeast, and Western.

Table C1. Teacher variable definitions

Variable	Survey question	Definition
Stay in position	Thinking ahead to next year, what are your intentions?	1 if respondent selected "Stay in my current role"; 0 otherwise.
Top three factors in accepting position	What were the three most important factors in deciding to accept your current position?	1 if respondent indicated that the factor was a top 3 factor in accepting to their current role; 0 otherwise.
Teacher familiarity with community	Before you accepted your current position, how familiar were you with the community in which it is located?	1 if respondent indicated "somewhat" or "very" familiar; 0 otherwise.
Teacher perceived level of influence	How much influence do you think teachers have over school policy in your current school in each of the following areas? • Setting performance standards for students at this school • Establishing curriculum • Determining the content of inservice professional development programs • Evaluating teachers • Hiring new full-time teachers • Setting discipline policy • Deciding how the school budget will be spent	Response options were on a 4-point Likert scale (1- No influence, 2- Minor influence, 3- Moderate influence, and 4- A great deal of influence). We first created a composite score by averaging over the seven domains. We next created an indicator variable that was equal to 1 if the composite influence score was greater than 2 and 0 otherwise.
Teacher perceived level of control	How much control do you have in your classroom at your current school over the following areas of your planning and teaching? • Selecting textbooks and other instructional materials • Selecting content, topics, and skills to be taught • Selecting teaching techniques • Evaluating and grading students • Disciplining students • Determining the amount of homework to be assigned	Response options were on a 4-point Likert scale (1- No control, 2- Minor control, 3- Moderate control, and 4- A great deal of control). We created an indicator variable that was equal to 1 if a respondent selected "No control" for any of the six domains (i.e., if they ever indicated no control), and 0 otherwise.

Variable	Survey question	Definition
Teacher perceived leadership support	To what extent do you agree or disagree with each of the following statements? • The school administration's behavior toward the staff is supportive and encouraging. • My principal enforces school rules for student conduct and backs me up when I need it. • The principal knows what kind of school he or she wants and has communicated this vision to the staff. • In this school, staff members are recognized for a job well done.	Response options were on a 4-point Likert scale (1- Strongly disagree, 2- Somewhat disagree, 3- Somewhat agree, 4- Strongly agree). We first created a composite score by averaging over the four domains. We next created an indicator variable that was equal to 1 if the composite supportive leadership score was greater than 2 and 0 otherwise.
Teacher perceived collegiality	To what extent do you agree or disagree with each of the following statements? • Most of my colleagues share my beliefs and values about what the central mission of the school should be. • There is a great deal of cooperative effort among the staff members.	Response options were on a 4-point Likert scale (1- Strongly disagree, 2- Somewhat disagree, 3- Somewhat agree, 4- Strongly agree). We first created a composite score by averaging over the two domains. We next created an indicator variable that was equal to 1 if the composite collegiality score was greater than 2 and 0 otherwise.
Teacher perceived accountability concerns	To what extent do you agree or disagree with each of the following statements? • I worry about the security of my job because of the performance of my students or my school on state or local tests. • The Montana content standards have had a positive influence on my satisfaction with teaching.	Response options were on a 4-point Likert scale (1- Strongly disagree, 2- Somewhat disagree, 3- Somewhat agree, 4- Strongly agree). First, we reverse coded the first domain (job security) and next created a composite score by averaging over the two domains. We then created an indicator variable that was equal to 1 if the composite accountability score was greater than 2 and 0 otherwise.

Source: Montana Educatory Survey designed by education leaders in Montana and administered by the Center for Research on Rural Education at Montana State University with support from Regional Educational Laboratory Northwest at Education Northwest.

The responses to the teacher survey are summarized in table C2. The teacher survey response rate was 17 percent. Out of the 1,854 teachers who started the survey, approximately 1,400 completed it. (Note that the demographic characteristics were asked last, and therefore had the lowest response rates.) The teacher survey respondents were 78 percent female and 95 percent White, with teachers distributed approximately evenly across age categories and 54 percent of survey respondents holding a master's degree. A large percentage of survey respondents were veteran teachers, with more than five years of total experience (85 percent) and at least four years of experience working in Montana schools (79 percent). Most teacher respondents worked in non-rural school systems (68 percent) with more than 400 students (78 percent), and 21 percent of respondents worked in schools with a high percentage of students receiving free or reduced-price lunch. Teacher respondents were well distributed across school system classifications, and we received data from each MASS region, although some regions were not as well represented. The remaining rows in the table summarize teacher perceptions and were used in the subgroup analyses (table C2).

Table C2. Descriptive statistics of the teacher survey respondents

Variable	Mean (Percent)	Number
Percentage female	78	1,400
Percentage White	95	1,395
Percentage non-White	4	1,395
Percentage enrolled in American Indian tribe	1	1,395
Age: Percentage younger than 35	24	1,405
Age: Percentage ages between 35 and 44	28	1,405
Age: Percentage ages between 45 and 54	26	1,405
Age: Percentage ages 55 or older	21	1,405
Percentage with master's degree	54	1,527
Percentage employed full-time	96	1,854
Percentage employed part-time or as a long-term substitute	4	1,854
Total experience: Percentage novice (1 year)	3	1,626
Total experience: Percentage early career (2–4 years)	12	1,626
Total experience: Percentage veteran (more than 5 years)	85	1,626
Experience in state: Percentage novice (less than 1 year)	5	1,628
Experience in state: Percentage early career (1–3 years)	16	1,628
Experience in state: Percentage veteran (4 years or more)	79	1,628
Non-rural	68	1,650
Rural-distant/fringe	12	1,650
Rural-remote	20	1,650
System enrollment: fewer than 100 students	6	1,650
System enrollment: between 100 and 400 students	17	1,650
System enrollment: more than 400 students	78	1,650
System percentage FRL: Lowest quartile	4	1,650
System percentage FRL: Interquartile	75	1,650
System percentage FRL: Top quartile	21	1,650
System has < 11.2 percent American Indian students	87	1,650
System has between 11.2 and 50 percent American Indian students	9	1,650
System > 50 percent American Indian students	4	1,650
System comprising districts with class AA	37	1,648
System comprising districts with class A	26	1,648
System comprising districts with class B	11	1,648
System comprising districts with class C	17	1,648
System comprising districts with IE	10	1,648
4 Rivers MASS region	20	1,475
Central MASS region	2	1,475
Hi-Line MASS region	6	1,475
North Central MASS region	11	1,475
North West MASS region	24	1,475

Variable	Mean (Percent)	Number
Northeast MASS region	6	1,475
Southcentral MASS region	12	1,475
Southeast MASS region	4	1,475
Western MASS region	15	1,475
Teacher perceived level of influence (no or minor influence)	48	1,421
Teacher perceived level of influence (moderate or great deal)	52	1,421
Teacher perceived level of control (no control in at least 1 domain)	17	1,421
Teacher perceived level of control (at least minor control)	83	1,421
Teacher perceived leadership support (somewhat or strongly disagree)	21	1,417
Teacher perceived leadership support (somewhat or strongly agree)	79	1,417
Teacher perceived collegiality (somewhat or strongly disagree)	17	1,416
Teacher perceived collegiality (somewhat or strongly agree)	83	1,416
Teacher perceived accountability concerns (somewhat or strongly disagree)	15	1,413
Teacher perceived accountability concerns (somewhat or strongly agree)	85	1,413

Notes: FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

School system classifications are based on enrollment of the high school district within a school system, as follows:

- Class AA: high school enrollment of 779 or greater
- Class A: high school enrollment between 307 and 778 students
- Class B: high school enrollment between 108 and 306 students
- Class C: high school enrollment less than 107 students
- Independent elementary schools (IE)

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Definitions of key variables from the principal survey are provided below (table C3).

Table C3. Principal variable definitions

Variable(s)	Survey question	Definition
Stay in position	Thinking ahead to next year, what are your intentions?	1 if respondent selected "Stay in my current role"; 0 otherwise.
Top three factors in accepting position	What were the three most important factors in deciding to accept your current position?	1 if respondent indicated that the factor was a top 3 factor in accepting to their current role; 0 otherwise.
Barriers to hiring teachers	To what extent are the following factors barriers to hiring teachers in your school?	1 if respondent indicated that the factor was a moderate or large barrier; 0 otherwise.

Variable(s)	Survey question	Definition
Principal overall satisfaction with job	To what extent do you agree or disagree with each of the following statements? • I am generally satisfied with being a principal at this school. • I am satisfied with my salary as principal. • I am satisfied with the benefits package I receive as principal. • Politics and controversy make being a principal at this school difficult. • The stress and disappointments involved in serving as principal at this school aren't really worth it. • I like the way things are run in this district.	Response options were on a 4-point Likert scale (1- Strongly disagree, 2- Disagree, 3- Agree, 4- Strongly agree). First, we reverse coded the fourth (politics) and fifth (stress and disappointments) domains. We next created an indicator variable that was equal to 1 if a respondent ever selected "Disagree" or "Strongly disagree" for any of the six domains (i.e., if they ever indicated dissatisfaction), and 0 otherwise.
Principal perceived school conditions	To what extent do you agree or disagree with the following statements: • This school has clean and safe building conditions. • Internet access is not a problem at this school.	Response options were on a 4-point Likert scale (1- Strongly disagree, 2- Disagree, 3- Agree, 4- Strongly agree). We created an indicator variable that was equal to 1 if a respondent ever selected "Disagree" or "Strongly disagree" for any of the two domains (i.e., if they ever indicated dissatisfaction), and 0 otherwise.
Principal perceived family support in school	To what extent do you agree or disagree with the following statements: • The community supports this school. • At this school, families are highly involved in students' education.	Response options were on a 4-point Likert scale (1- Strongly disagree, 2- Disagree, 3- Agree, 4- Strongly agree). We created an indicator variable that was equal to 1 if a respondent ever selected "Disagree" or "Strongly disagree" for any of the two domains (i.e., if they ever indicated dissatisfaction), and 0 otherwise.
Principal perceived staff satisfaction	To what extent do you agree or disagree with the following statements: • The faculty and staff at this school like being here; I would describe them as a satisfied group.	1 if respondent indicated "Agree" or "Strongly agree"
Principal perceived support	To what extent do you agree or disagree with the following statements: • I know who to call at the district when I need help. • I receive the support I need from my staff to lead this school successfully. • When I have a question about state or federal policy or law, I have someone I can call.	Response options were on a 4-point Likert scale (1- Strongly disagree, 2- Disagree, 3- Agree, 4- Strongly agree). We created an indicator variable that was equal to 1 if a respondent ever selected "Disagree" or "Strongly disagree" for any of the three domains (i.e., if they ever indicated dissatisfaction), and 0 otherwise.

Variable(s)	Survey question	Definition
Principal perceived level of involvement in school policy	How much ACTUAL involvement do you have as a principal on decisions concerning the following activities at your current school? • Setting performance standards for students • Choosing curriculum materials • Establishing pacing guides or other types of curriculum frameworks • Determining the content of in-service professional development programs for teachers of this school • Setting discipline policy at the school • Determining how your school budget will be spent • Deciding on participation in grants or special projects	Response options were on a 4-point Likert scale (1- No involvement, 2- Minor involvement, 3- Moderate involvement, 4- Major involvement). We created an indicator variable that was equal to 1 if a respondent ever selected "Minor involvement" or "No involvement" for any of the seven domains (i.e., if they ever no or minor involvement), and 0 otherwise.
Principal perceived level of involvement in staffing decisions	How much ACTUAL involvement do you have as a principal on decisions concerning the following activities at your current school? • Hiring teachers • Evaluating teachers • Dismissing teachers	Response options were on a 4-point Likert scale (1- No involvement, 2- Minor involvement, 3- Moderate involvement, 4- Major involvement). We created an indicator variable that was equal to 1 if a respondent ever selected "Minor involvement" or "No involvement" for any of the seven domains (i.e., if they ever no or minor involvement), and 0 otherwise.

Source: Montana Educatory Survey designed by education leaders in Montana and administered by the Center for Research on Rural Education at Montana State University with support from the Regional Educational Laboratory Northwest at Education Northwest.

The principal survey response rate was 20 percent, with a total of 93 principals and assistant principals completing the survey (out of the 122 respondents who started the survey) (table C4). Forty-two percent of survey respondents were female, and 89 percent were White, with about 75 percent of respondents under the age of 55. A vast majority of respondents (91 percent) had a master's degree as their highest degree. Most principals responding to the survey were veteran administrators, with five or more years of experience at the school (51 percent), district (64 percent), or state (72 percent) level, and 95 percent of the responding principals had five or more years of teaching experience. Most survey respondents were from non-rural, large schools and 22 percent worked in school systems with a high percentage of students who qualified for free or reduced-price lunch. The last set of rows summarize principals' perceptions of their working environment and were used in the subgroup analyses.

Table C4. Descriptive statistics of the principal survey respondents

Variable	Mean (Percent)	Number
Position: Principal	88	122
Position: Assistant principal	12	122
Percentage female	42	93
Percentage White	89	94
Percentage non-White	11	94
Percentage enrolled in American Indian tribe	4	94
Age: Percentage younger than 44	33	94
Age: Percentage between 44 and 54	42	94
Age: Percentage 55 or older	26	94
Highest degree: Master's degree	91	103
Highest degree: Specialist or doctorate	9	103
Experience in school: Percentage novice (1 year)	16	100
Experience in school: Percentage early career (2–4 years)	33	100
Experience in school: Percentage veteran (5 or more years)	51	100
Experience in district: Percentage novice (1 year)	9	99
Experience in district: Percentage early career (2–4 years)	27	99
Experience in district: Percentage veteran (5 or more years)	64	99
Experience in state: Percentage novice (1 year)	7	99
Experience in state: Percentage early career (2–4 years)	21	99
Experience in state: Percentage veteran (5 or more years)	72	99
Experience anywhere: Percentage novice (1 year)	6	86
Experience anywhere: Percentage early career (2–4 years)	22	86
Experience anywhere: Percentage veteran (5 or more years)	72	86
Experience teaching: Percentage novice (1 year)	0	103
Experience teaching: Percentage early career (2–4 years)	5	103
Experience teaching: Percentage veteran (5 or more years)	95	103
Experience prior to state, years anywhere: Percentage novice (1 year)	9	122
Experience prior to state, years anywhere: Percentage early career (2–4 years)	27	122
Experience prior to state, years anywhere: Percentage veteran (5 or more years)	64	122
Percentage worked in at least 1 other school in MT as principal	46	122
Percentage worked in at least 1 other district in MT as assistant principal/principal	40	122

Variable	Mean (Percent)	Number
Non-rural	55	120
Rural-distant/fringe	14	120
Rural-remote	31	120
System enrollment: fewer than 100 students	1	120
System enrollment: between 100 and 400 students	24	120
System enrollment: more than 400 students	75	120
System percentage FRL: Lowest quartile	2	120
System percentage FRL: Interquartile	77	120
System percentage FRL: Top quartile	22	120
< 11.2 percent American Indian students	83	120
Between 11.2 and 50 percent American Indian students	8	120
> 50 percent American Indian students	9	120
System comprising districts with class AA	27	120
System comprising districts with class A	18	120
System comprising districts with class B	27	120
System comprising districts with class C	20	120
System comprising districts with IE	8	120
4 Rivers MASS region	21	109
Central MASS region	3	109
Hi-Line MASS region	5	109
North Central MASS region	12	109
North West MASS region	17	109
Northeast MASS region	7	109
Southcentral MASS region	14	109
Southeast MASS region	7	109
Western MASS region	14	109
Principal overall satisfaction with job (ever dissatisfied)	67	94
Principal overall satisfaction with job (satisfied)	33	94
Principal perceived school conditions (ever dissatisfied)	14	94
Principal perceived school conditions (satisfied)	86	94
Principal perceived family support in school (ever dissatisfied)	46	94
Principal perceived family support in school (satisfied)	54	94
Principal perceived staff satisfaction (disagree or strongly disagree)	14	94
Principal perceived staff satisfaction (agree or strongly agree)	86	94

Variable	Mean (Percent)	Number
Principal perceived support (ever dissatisfied)	21	94
Principal perceived support (satisfied)	79	94
Principal perceived level of involvement in school policy (ever no or minor involvement)	60	94
Principal perceived level of involvement in school policy (moderate or major involvement)	40	94
Principal perceived level of involvement in staff policy (ever no or minor involvement)	4	94
Principal perceived level of involvement in staff policy (moderate or major involvement)	96	94

Notes: FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents. School system classifications are based on enrollment of the high school district within the school system, as follows:

- Class AA: high school enrollment of 779 or greater
- Class A: high school enrollment between 307 and 778 students
- Class B: high school enrollment between 108 and 306 students
- Class C: high school enrollment less than 107 students
- Independent elementary schools (IE)

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

The variable definitions for the superintendent survey are provided below (table C5).

Table C5. Superintendent variable definition

Variable(s)	Survey question	Definition
Stay in position	Thinking ahead to next year, what are your intentions?	1 if respondent selected "Stay in my current role"; 0 otherwise.
Future plans as administrator	How long do you plan to remain working as a school or district administrator in Montana?	1 if respondent selected any of the following options: 1. As long as I am able 2. Until I am eligible for retirement benefits from this job 3. Until I am eligible for retirement benefits from a previous job 4. Until I am eligible for Social Security benefits And 0 otherwise.
Top three factors in accepting position	What were the three most important factors in deciding to accept your current position?	1 if respondent indicated that the factor was a top 3 factor in accepting to their current role; 0 otherwise. We also combined several factors into composite variables where the variable equaled 1 if any of the included domains were equal to 1 and 0 otherwise. These included: (Location = "Location – close to where I live", "Location – close to where I grew up", "Location – close to where I went to college/university"); (Prior experience in the district = "Previous experience working in this district", "Teaching experience in this district"); (District or school reputation = "District reputation", "School reputation")

Variable(s)	Survey question	Definition
Barriers to hiring teachers	To what extent are the following factors barriers to hiring teachers in your school?	1 if respondent indicated that the factor was a moderate or large barrier; 0 otherwise.
Superintendent overall satisfaction with job	To what extent do you agree or disagree with each of the following statements? • I am generally satisfied with being a superintendent in this district. • I am satisfied with my salary as superintendent. • I am satisfied with the benefits package I receive as superintendent. • Politics and controversy make being a superintendent in this district difficult.	Response options were on a 4-point Likert scale (1- Strongly disagree, 2- Disagree, 3- Agree, 4- Strongly agree). First, we reverse coded the fourth (politics) domain. We next created an indicator variable that was equal to 1 if a respondent ever selected "Disagree" or "Strongly disagree" for any of the four domains (i.e., if they ever indicated dissatisfaction), and 0 otherwise.
Superintendent perceived support	To what extent do you agree or disagree with the following statements: • I receive the support I need from my staff to lead this district successfully. • When I have a question about state/federal policy/law, I have someone I can call.	Response options were on a 4-point Likert scale (1- Strongly disagree, 2- Disagree, 3- Agree, 4- Strongly agree). We created an indicator variable that was equal to 1 if a respondent ever selected "Disagree" or "Strongly disagree" for any of the two domains (i.e., if they ever indicated dissatisfaction), and 0 otherwise.

Source: Montana Educatory Survey designed by education leaders in Montana and administered by the Center for Research on Rural Education at Montana State University with support from the Regional Educational Laboratory Northwest at Education Northwest.

The summary statistics for the superintendent survey respondents are provided below (table C6). The superintendent survey had the highest response rate (58 percent). The superintendent survey respondents were 30 percent female and 96 percent White, with most respondents over the age of 45. Among the respondents, 63 percent of superintendents had a master's degree and 32 percent had a specialist or doctorate degree. While 12 percent of superintendents were new to their school system, only 6 percent were first-time superintendents in Montana, and a large proportion had experience in other states. Interestingly, 51 percent of responding superintendents worked in rural-remote school systems and 26 percent worked in school systems with a high percentage of students qualifying for free or reduced-price lunch. Most superintendent respondents were from class C or IE school systems, and respondents were spread out across MASS regions. Finally, the last four rows of the table present summary statistics on superintendent satisfaction with their working conditions.

Table C6. Descriptive statistics of the superintendent survey respondents

Variable	Mean (Percent)	Number
Percentage female	30	116
Percentage White	96	118
Percentage non-White	4	118
Percentage enrolled in American Indian tribe	1	118
Age: Percentage younger than 44	17	119
Age: Percentage between 44 and 54	43	119
Age: Percentage 55 or older	40	119
Highest degree: Bachelor's	5	121
Highest degree: Master's	63	121
Highest degree: Specialist or doctorate	32	121
Experience as superintendent in district: Percentage novice (1 year)	12	121
Experience as superintendent in district: Percentage early career (2–4 years)	46	121
Experience as superintendent in district: Percentage veteran (5 or more years)	43	121
Experience as superintendent in state: Percentage novice (1 year)	6	121
Experience as superintendent in state: Percentage early career (2–4 years)	31	121
Experience as superintendent in state: Percentage veteran (5 or more years)	63	121
Experience as administrator in district: Percentage novice (1 year)	9	121
Experience as administrator in district: Percentage early career (2–4 years)	38	121
Experience as administrator in district: Percentage veteran (5 or more years)	53	121
Experience as administrator in other states: Percentage novice (1 year)	13	30
Experience as administrator in other states: Percentage early career (2–4 years)	23	30
Experience as administrator in other states: Percentage veteran (5 or more years)	63	30
Prior Year Teaching Experience: 25 percentile: 6 years	28	121
Prior Year Teaching Experience: 25-75 percentile: 6-13 years	50	121
Prior Year Teaching Experience: 75 percentile: 13 years	22	121
Non-rural	25	121
Rural-distant/fringe	24	121
Rural-remote	51	121
System enrollment: fewer than 100 students	22	121
System enrollment: between 100 and 400 students	43	121
System enrollment: more than 400 students	36	121
System percent FRL: Lowest quartile	12	121
System percent FRL: Interquartile	62	121
System percent FRL: Top quartile	26	121
< 11.2 percent American Indian students	88	121
Between 11.2 and 50 percent American Indian students	5	121
> 50 percent American Indian students	7	121
System comprising districts with class A	10	121
System comprising districts with class AA	4	121

Variable	Mean (Percent)	Number
System comprising districts with class B	19	121
System comprising districts with class C	41	121
System comprising districts with IE	26	121
4 Rivers MASS region	23	93
Central MASS region	7	93
Hi-Line MASS region	4	93
North Central MASS region	11	93
North West MASS region	13	93
Northeast MASS region	13	93
Southcentral MASS region	11	93
Southeast MASS region	8	93
Western MASS region	12	93
Superintendent overall satisfaction with job (ever dissatisfied)	70	118
Superintendent overall satisfaction with job (satisfied)	31	118
Superintendent perceived support (ever dissatisfied)	11	117
Superintendent perceived support (satisfied)	89	117

Notes: FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents. School system classifications are based on enrollment of the high school district within the school system, as follows:

- Class AA: high school enrollment of 779 or greater
- Class A: high school enrollment between 307 and 778 students
- Class B: high school enrollment between 108 and 306 students
- Class C: high school enrollment less than 107 students
- Independent elementary schools (IE)

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Survey sample representativeness

We examined the extent to which the survey respondents were representative of educators in the state. For the teacher survey, the respondents included teachers who work in 182 of the 307 school systems (59 percent) in Montana. The number of teachers responding from each school system varied. While half of the school systems had between two and 10 teachers reply (51 percent), a third had only one teacher complete the survey (34 percent).

The school systems represented in the study were mostly similar to the universe of school systems overall, with a few exceptions. Slightly more school systems designated class B were in our sample, while fewer school systems designated IE were represented. In terms of school system size, larger school systems were overrepresented in our sample, while smaller school systems were underrepresented. Low-poverty school systems were also underrepresented,

while school systems in the 25th to 75th percentile of poverty level within the state were overrepresented. Finally, school systems represented in our teacher survey served slightly more Hispanic students than the state overall (while this difference was significant at the 5 percent level, it was small in magnitude–1 percentage point) (table C7).

Table C7. Comparison of school system characteristics: Teacher survey sample versus entire state

	All Montana school systems		Sample school systems		
Variable(s)	N	Mean (percent)	N	Mean (percent)	Difference (percent)
4 Rivers MASS region	303	20	182	20	0
Central MASS region	303	5	182	6	-1
Hi-Line MASS region	303	8	182	7	1
North Central MASS region	303	11	182	7	4
North West MASS region	303	11	182	13	-2
Northeast MASS region	303	9	182	10	-1
Southcentral MASS region	303	13	182	12	1
Southeast MASS region	303	10	182	9	1
Western MASS region	303	13	182	16	-3
System comprising districts with class AA	296	2	180	4	-2
System comprising districts with class A	296	6	180	9	-3
System comprising districts with class B	296	13	180	19	-6*
System comprising districts with class C	296	33	180	37	-4
System comprising districts with IE	296	45	180	31	14***
Non-rural	302	14	182	20	-6*
Rural-distant/fringe	302	25	182	26	-1
Rural-remote	302	61	182	54	7
System enrollment: fewer than 100 students	307	44	182	27	17***
System enrollment: between 100 and 400 students	307	33	182	37	-4
System enrollment: more than 400 students	307	23	182	36	-13***
System percentage FRL: Lowest quartile	307	31	182	19	12***
System percentage FRL: Interquartile	307	44	182	55	-11**
System percentage FRL: Top quartile	307	24	182	26	-2
American Indian students: lower than Montana average	305	87	182	88	-1
American Indian students: between 11.2 and 50 percent	305	6	182	4	2
American Indian students: higher than 50 percent	305	8	182	8	0

Variable(s)	All Montana school systems		Sample school systems		Difference (percent)
	N	Mean (percent)	N	Mean (percent)	
Percentage American Indian in the system	305	10	182	9	1
Percentage Asian in the system	305	1	182	1	0
Percentage Hispanic in the system	305	3	182	3	-1**
Percentage Black in the system	305	0	182	0	0
Percentage White in the system	305	84	182	84	0
Percentage Hawaiian in the system	305	0	182	0	0
Percentage Two or more races in the system	305	2	182	3	0

*p<0.05 **p<0.01 ***p<0.001.

Notes: Authors conducted t-test to examine whether the difference between two groups were statistically significant; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents. School system classifications are based on enrollment of the high school district within the school system, as follows:

- Class AA: high school enrollment of 779 or greater
- Class A: high school enrollment between 307 and 778 students
- Class B: high school enrollment between 108 and 306 students
- Class C: high school enrollment less than 107 students
- Independent elementary schools (IE)

Percentages may not sum to 100 because of rounding.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Next, principals in the study represented 70 of the 307 school systems in the state. Forty-three school systems had only one principal respond to the survey, 19 school systems had two principals, and eight school systems had more than two principals. The maximum number of principals responding from any one school system was 10 (Helena Public Schools). Both Billings Public Schools and Bozeman Public Schools had six principals take the survey.

The school systems represented by the principal sample were similar to the overall population of school systems, with a few exceptions (table C8). We see more school systems representing class A and AA districts in our sample and fewer school systems of class C and IE districts. We also found more non-rural school systems and less rural-remote school systems in our principal sample, as compared to the entire state. In terms of enrollment, the principal sample included a greater share of large school systems (63 percent of school systems in the principal sample enrolled more than 400 students relative to 23 percent of school systems with similar enrollment in the state) and smaller share of small school systems (1 percent of school systems in our sample enrolled fewer than 100 students relative to 44 percent in the state). Also, in our sample there were fewer low-poverty school systems and more mid-range poverty school systems (25th to 75th percentile of poverty level in the state). School systems in our sample also served more non-White students than school systems in the state overall (higher shares of Hispanic and Black students and lower shares of White students).

Table C8. Comparison of school system characteristics: Principal survey sample versus entire state

Variable(s)	All Montana school systems		Sample school systems		Difference (percent)
	N	Mean (percent)	N	Mean (percent)	
4 Rivers MASS region	303	20	70	14	6
Central MASS region	303	5	70	3	2
Hi-Line MASS region	303	8	70	9	-1
North Central MASS region	303	11	70	13	-2
North West MASS region	303	11	70	17	-6
Northeast MASS region	303	9	70	10	-1
Southcentral MASS region	303	13	70	13	0
Southeast MASS region	303	10	70	4	6
Western MASS region	303	13	70	17	-4
System comprising districts with class AA	296	2	70	9	-7**
System comprising districts with class A	296	6	70	17	-11***
System comprising districts with class B	296	13	70	33	-20***
System comprising districts with class C	296	33	70	29	4
System comprising districts with IE	296	45	70	13	32***
Non-rural	302	14	70	40	-26***
Rural-distant	302	25	70	20	5
Rural-remote	302	61	70	40	21***
System enrollment: fewer than 100 students	307	44	70	1	43***
System enrollment: between 100 and 400 students	307	33	70	36	-3
System enrollment: more than 400 students	307	23	70	63	-40***
System percentage FRL: Lowest quartile	307	31	70	3	28***
System percentage FRL: Interquartile	307	44	70	69	-25***
System percentage FRL: Top quartile	307	24	70	29	-5
American Indian students: lower than Montana average	305	87	70	80	7
American Indian students: between 11.2 add 50 percent	305	6	70	9	-3
American Indian students: higher than 50 percent	305	8	70	11	-3
Percentage American Indian in the system	305	10	70	13	-3
Percentage Asian in the system	305	1	70	1	0
Percentage Hispanic in the system	305	3	70	4	-1***

Variable(s)	All Montana school systems N	All Montana school systems Mean (percent)	Sample school systems N	Sample school systems Mean (percent)	Difference (percent)
Percentage Black in the system	305	0	70	1	-1***
Percentage White in the system	305	84	70	78	6***
Percentage Hawaiian in the system	305	0	70	0	0
Percentage Two or more races in the system	305	2	70	3	-1

*p<0.05 **p<0.01 ***p<0.001.

Notes: FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents. School system classifications are based on enrollment of the high school district within the school system, as follows:

- Class AA: high school enrollment of 779 or greater
- Class A: high school enrollment between 307 and 778 students
- Class B: high school enrollment between 108 and 306 students
- Class C: high school enrollment less than 107 students
- Independent elementary schools (IE)

Percentages may not sum to 100 because of rounding.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Finally, the superintendents in the study represented 113 different school systems. Of the school systems in the study, 105 had one superintendent or assistant superintendent complete the survey and eight had two superintendents or assistant superintendents complete the survey. Fewer school systems representing class IE were in the superintendent sample. More non-rural and less rural-remote school systems were represented in our superintendent sample. Similar to the teacher and principal samples, smaller school systems (in terms of enrollment) were underrepresented, while larger school systems were overrepresented. Similar to the previous samples, low-poverty school systems were underrepresented, while school systems in the 25th to 75th percentile of poverty level in the state were overrepresented. Finally, school systems in the superintendent sample served more Hawaiian students (table C9).

Table C9. Comparison of school system characteristics: Superintendent survey sample versus entire state

Variable(s)	All Montana school systems N	All Montana school systems Mean	Sample school systems N	Sample school systems Mean	Difference
4 Rivers MASS region	303	20	112	23	-3
Central MASS region	303	5	112	8	-3
Hi-Line MASS region	303	8	112	5	3
North Central MASS region	303	11	112	11	0
North West MASS region	303	11	112	11	0
Northeast MASS region	303	9	112	13	-4
Southcentral MASS region	303	13	112	8	5

Variable(s)	All Montana school systems		Sample school systems		Difference
	N	Mean	N	Mean	
Southeast MASS region	303	10	112	9	1
Western MASS region	303	13	112	12	1
System comprising districts with class AA	296	2	113	3	-1
System comprising districts with class A	296	6	113	11	-5
System comprising districts with class B	296	13	113	19	-6
System comprising districts with class C	296	33	113	41	-8
System comprising districts with IE	296	45	113	27	18***
Non-rural	302	14	113	25	-11***
Rural-distant/fringe	302	25	113	23	2
Rural-remote	302	61	113	52	9*
System enrollment: fewer than 100 students	307	44	113	23	21***
System enrollment: between 100 and 400 students	307	33	113	42	-11*
System enrollment: more than 400 students	307	23	113	35	-12**
System percentage FRL: Lowest quartile	307	31	113	12	19***
System percentage FRL: Interquartile	307	44	113	60	-16***
System percentage FRL: Top quartile	307	24	113	27	-3
American Indian students: lower than Montana average	305	87	113	87	0
American Indian students: between 11.2 and 50 percent	305	5	113	5	0
American Indian students: higher than 50 percent	305	8	113	8	0
Percentage American Indian in the system	305	10	113	10	-1
Percentage Asian in the system	305	1	113	1	0
Percentage Hispanic in the system	305	3	113	3	0
Percentage Black in the system	305	0	113	1	0
Percentage White in the system	305	84	113	82	2
Percentage Hawaiian in the system	305	0	113	0	0**
Percentage Two or more races in the system	305	2	113	3	-1

*p<0.05 **p<0.01 ***p<0.001.

Notes: FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents. School system classifications are based on enrollment of the high school district within the school system, as follows:

- Class AA: high school enrollment of 779 or greater
- Class A: high school enrollment between 307 and 778 students
- Class B: high school enrollment between 108 and 306 students
- Class C: high school enrollment less than 107 students
- Independent elementary schools (IE)

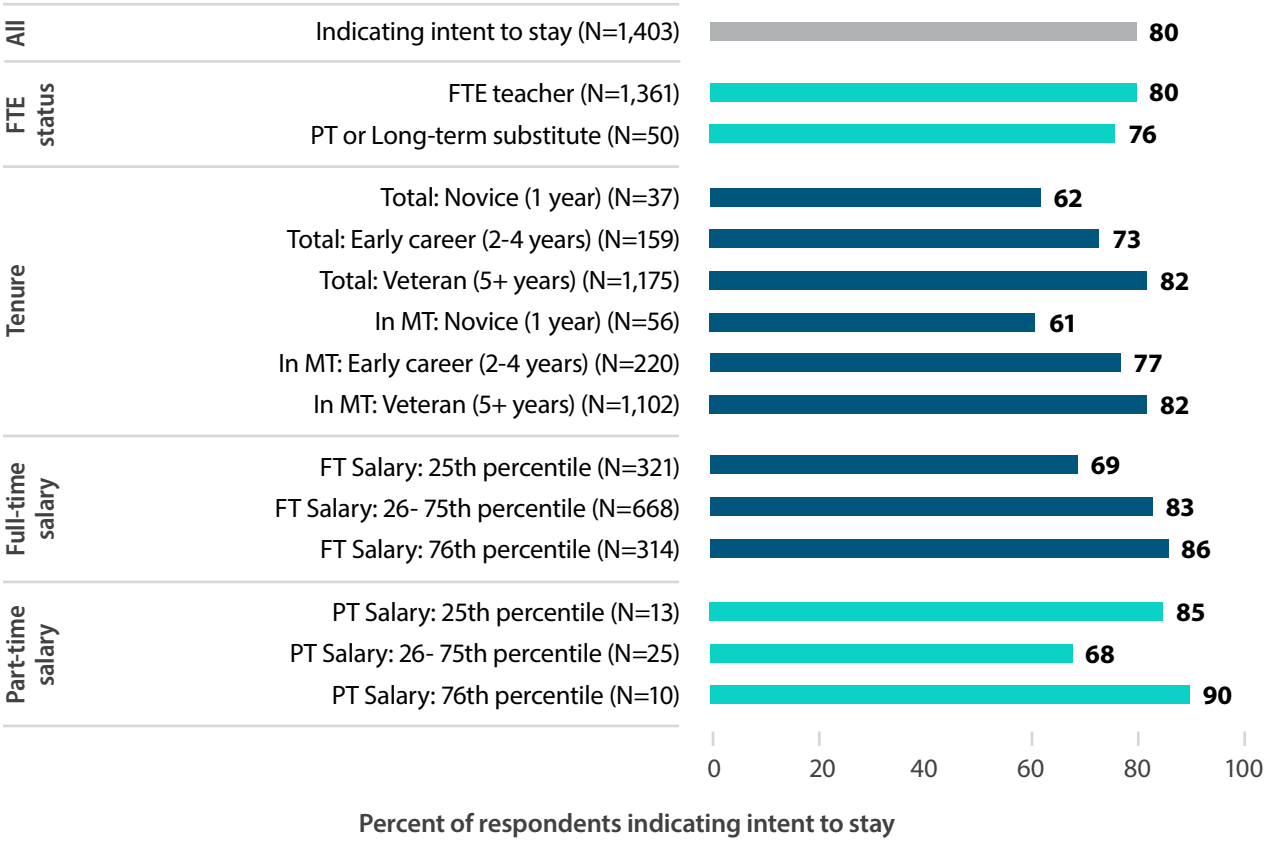
Percentages may not sum to 100 because of rounding.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Teacher intention to stay in the same position and school system, by teacher and school characteristics

Eighty percent of teachers reported they intended to stay in their teaching position and school system (figure C1). Findings show no differences by part/full-time status (80 percent for full-time teachers and 76 percent for part-time teachers or long-term substitutes, although note that only 50 teachers fell into the latter category, and the difference was not statistically significant). When examining differences by teacher experience, we see that fewer novice teachers intended to stay in their position compared to veteran teachers, both by overall teaching experience (62 percent for novice, 82 percent for veteran) and by Montana-specific teaching experience (61 percent novice versus 82 percent veteran), and these differences were statistically significant at the 5 percent level. We also observe differences in intention to stay by salary, which was separated for full- and part-time teachers. For full-time teachers, fewer teachers with the lowest salary reported they were likely to stay in teaching (69 percent), as compared to teachers with the highest salaries (86 percent), and this difference was statistically significant. The patterns are different for part-time teachers: Here it is teachers with medium-level salaries who were the least likely to report that they would return to their position, compared to the other two salary groups (although we note that the sample sizes for these subgroups are small, and none of the differences were statistically significant).

Figure C1. Teacher intention to stay in the same position and school system varied significantly by tenure and salary among full-time teachers (percent)



Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup.

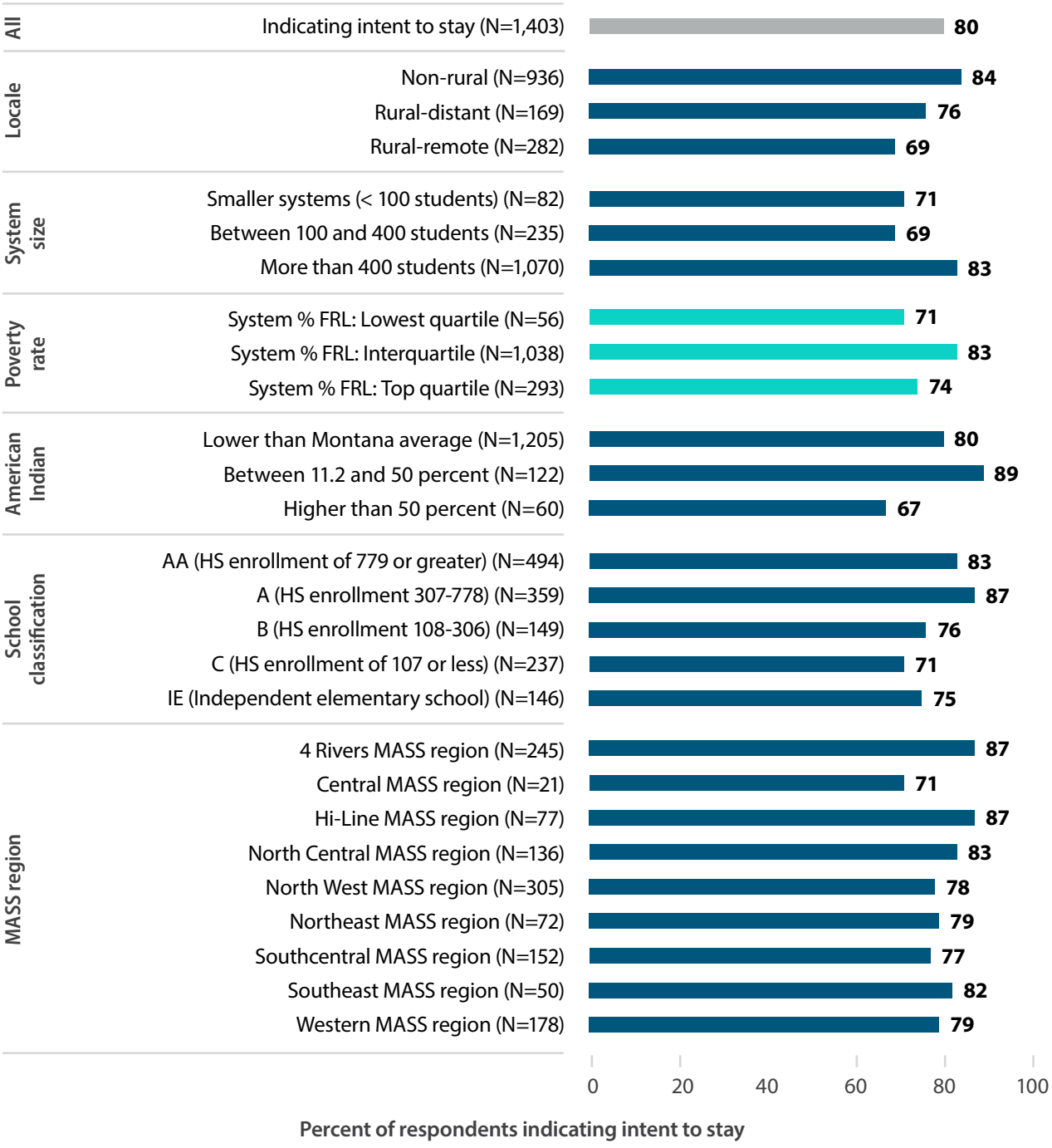
Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

When examining the difference by locale, we found that 69 percent of teachers in rural-remote locations intended to stay in their position, whereas these percentages were 76 percent for rural-distant school systems and 84 percent for non-rural school systems (both the difference between rural-remote versus non-rural and rural-distant versus non-rural were statistically significant at the 5 percent level) (figure C2). In school systems with 100 students or less, 71 percent of teachers intended to stay, whereas 69 percent of teachers intended to stay in school systems with 100–400 students and 83 percent intended to stay in the largest school systems (with the difference between the smallest versus largest and medium versus largest school systems being statistically significant at the 5 percent level).

Differences by percentage of students receiving free or reduced-price lunch (FRL) showed an unusual pattern, with 71 percent of teachers in the lowest FRL quartile reporting that they intended to stay, 83 percent reporting they intended to stay for student FRL between 25 percent and 75 percent of the FRL distribution, and 74 percent of teachers whose school system is in the highest FRL quartile intended to stay in their position and school system, which represents the most disadvantaged schools (however these differences were not statistically significant). In school systems with high percentages of American Indian students (greater than 50 percent), 67 percent of teachers reported that they intended to stay compared to 80 percent of teachers in school systems with less than 11.2 percent American Indian students and 89 percent of teachers in school systems with more than 11.2 percent and less than 50 percent share of American Indian students (the difference between the high share versus medium share and high share versus low share being significant at the 5 percent level).

Differences by school classification indicate that teachers in class AA and A school systems were the most likely to report they intended to stay (87 percent and 83 percent, respectively), whereas teachers in school systems classified B, C, and IE were less likely to report they intended to stay (76 percent, 71 percent and 75 percent, respectively). Here, only the differences between class AA versus class C and class AA versus class IE were statistically significant at the 5 percent level. The differences by MASS region were notable, with 87 percent of teachers in 4 Rivers and Hi-Line reporting they intended to stay, as compared to 71 percent in the Central MASS region. In other MASS regions, between 77 percent and 83 percent of teachers reported they intended to stay. When comparing 4 Rivers and Hi-Line to the North West region, the differences were statistically significant at the 5 percent level.

Figure C2. Teacher intention to stay varied significantly by several school system characteristics (percent)

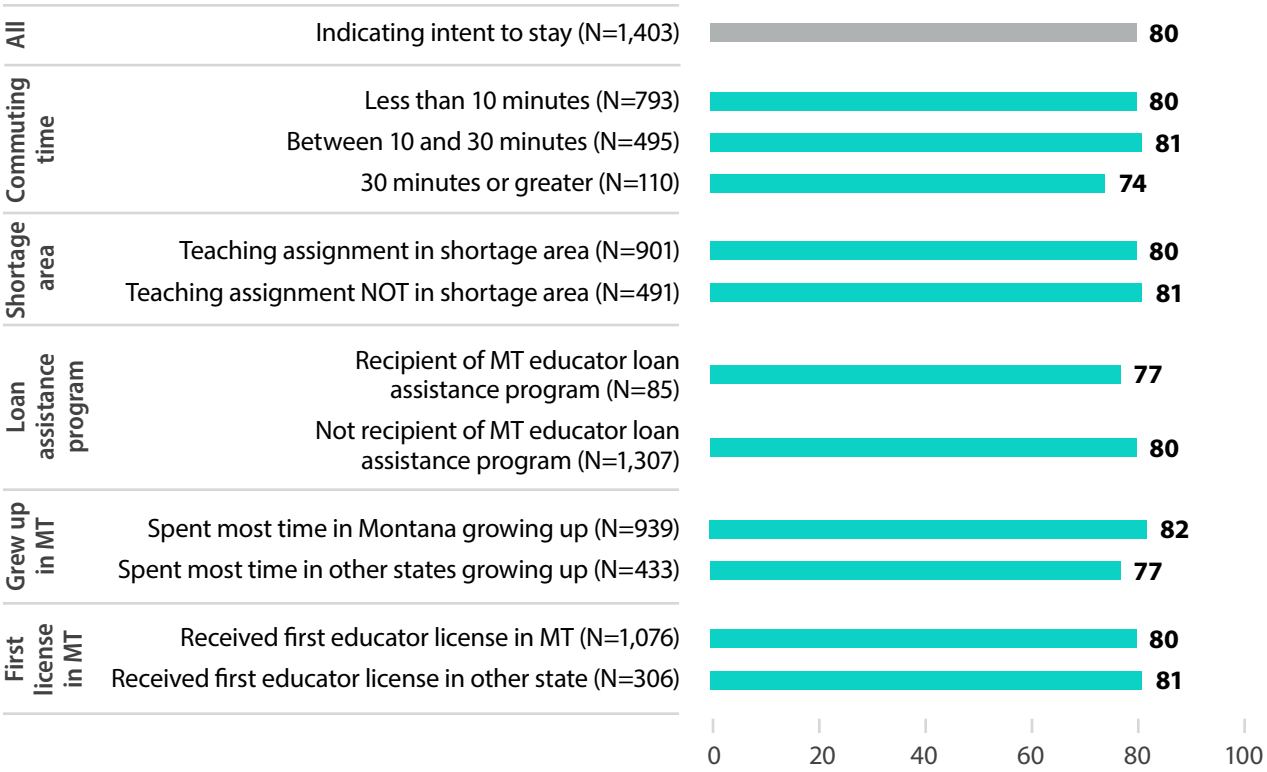


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

We examined differences in intention to stay by educator characteristics. Seventy-four percent of teachers who lived more than 30 minutes from the school reported that they intended to stay, as opposed to 80 percent and 81 percent of teachers who lived less than 10 minutes and 10–30 minutes from the school, respectively, but these differences were not statistically significant. There were only small differences in intention to stay for the other characteristics examined in this figure, such as working in a shortage area, participating in the loan assistance program, spending most of their life growing up in Montana, and receiving their first teaching license in Montana, and none of the subgroup differences were statistically significant (figure C3).

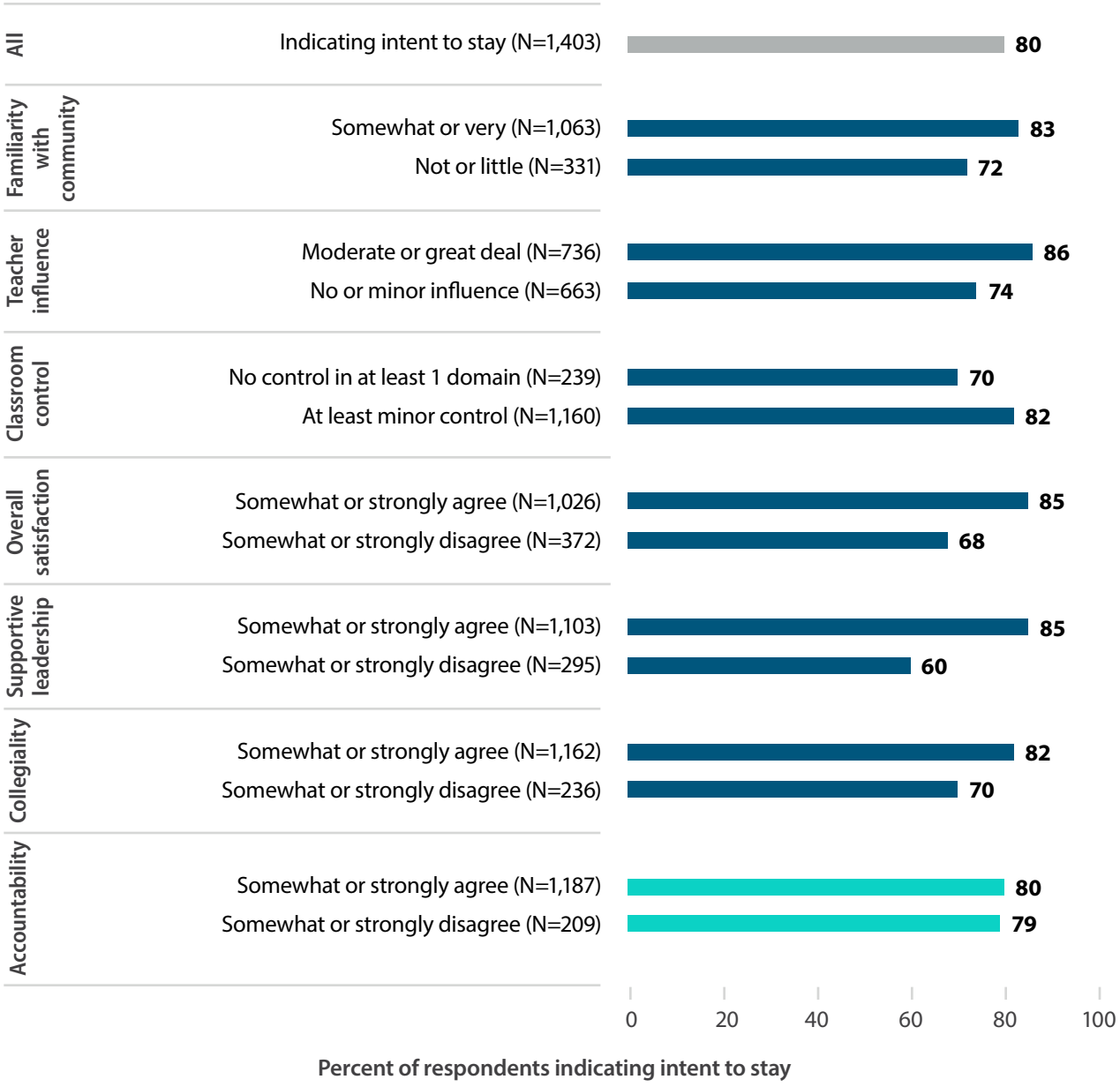
Figure C3. Teacher intention to stay in position did not vary significantly by commuting time, shortage area, loan recipient status, hometown, or state of first licensure (percent)



Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

We examined the differences in intention to stay by teachers' perceptions of different aspects of school climate. All subgroup differences were statistically significant, except for the subgroup examining accountability policies. Seventy-two percent of teachers who had no or little familiarity with the community reported they intended to stay, as compared to 83 percent of teachers reporting to stay who were somewhat or very familiar with the community. Similarly, 74 percent of teachers who had little or no influence reported they would stay, compared to 86 percent of teachers who felt they had moderate or a great deal of influence. There were marked differences in intention to stay by classroom control and overall satisfaction as well. We found the largest differences by teachers' perceptions of supportive leadership: 60 percent of teachers who somewhat or strongly disagreed that the leadership was supportive reported their intention to stay, as compared to 85 percent of teachers who reported that they somewhat or strongly agreed that the leadership was supportive. We see smaller differences by collegiality (figure C4).

Figure C4. Teacher intention to stay in position varied significantly by teacher perceptions of school climate (percent)



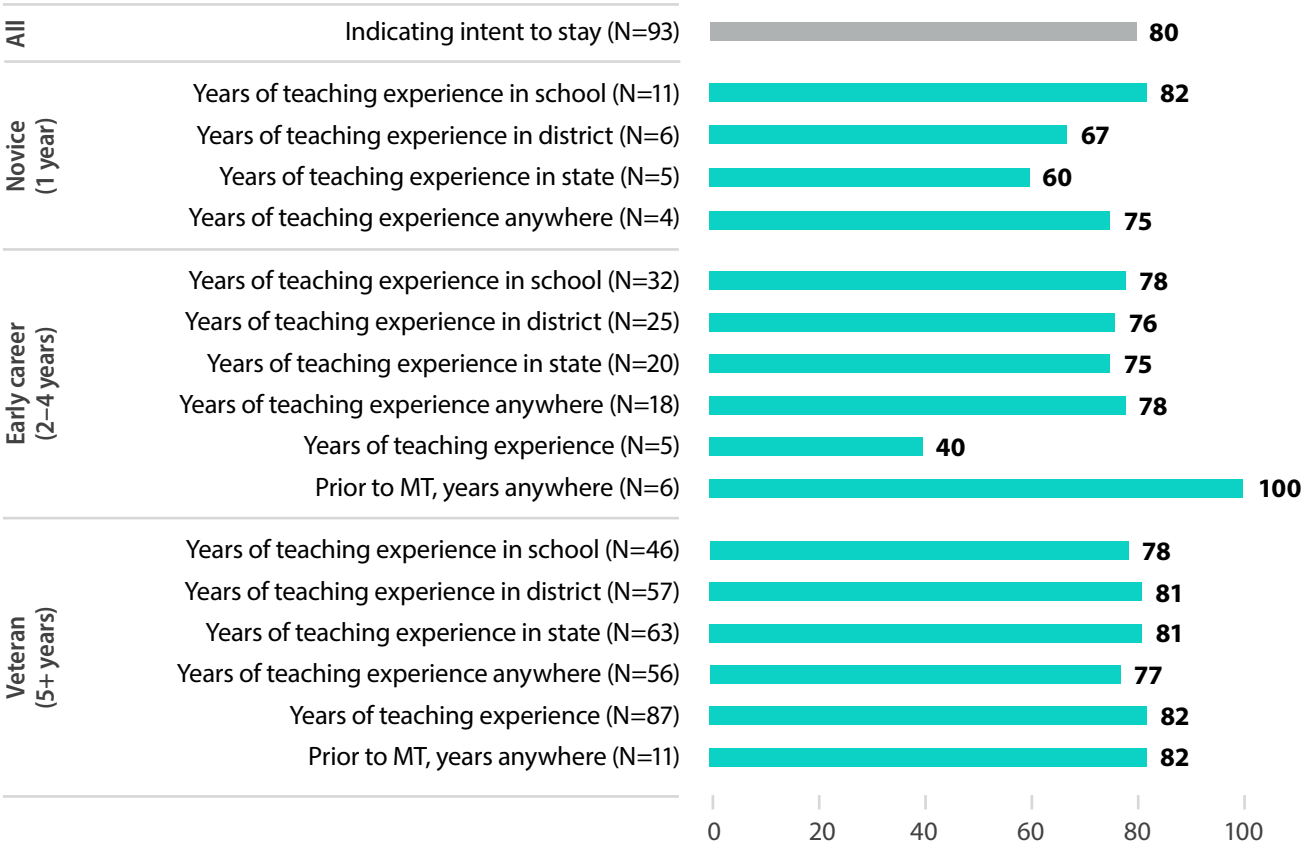
Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Principal intention to stay in position, by principal and school system characteristics

Similar to teachers, 80 percent of principals reported that they intended to stay in their positions in the next year. We examined the differences by principal tenure, measured in various ways. We note up front that due to the small sample sizes, none of the differences in this figure are statistically significant from zero. There were no noticeable differences in intention to stay by experience in the school; however, fewer principals who were new to the district reported that they intended to stay (67 percent) compared to early career and veterans in the district (76 percent and 81 percent, respectively). In addition, only 60 percent of principals new to the state reported that they intend to stay, as compared to early career and veteran principals in the state (75 percent and 81 percent, respectively). There were no statistically significant differences in intention to stay by overall experience. Only 40 percent of principals who reported having two to four years of experience as a teacher also reported that they intended to stay, as compared to 82 percent of principals with more than four years of teaching experience. However, there were only five respondents in the former category, since a large majority of principals had at least five years of experience teaching. Due to small respondent numbers in certain categories, it may be difficult to detect statistically significant differences (figure C5).

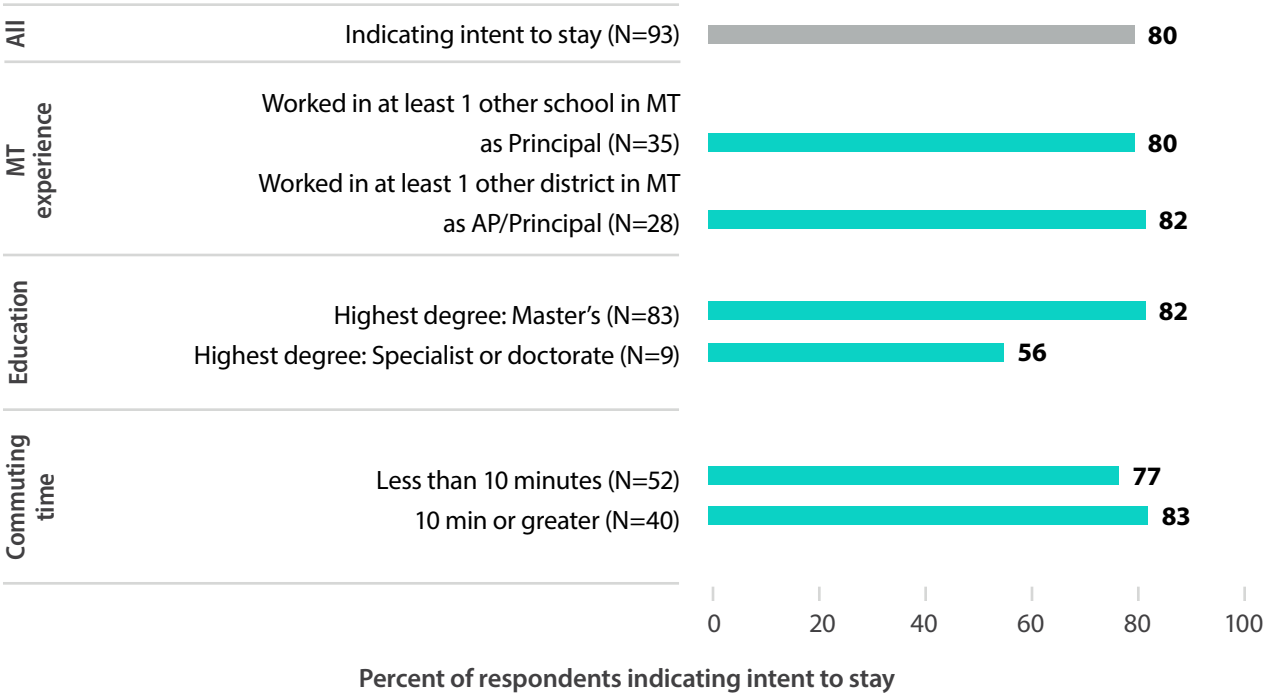
Figure C5. Principal intention to stay did not vary significantly by tenure (percent)



Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

We also examined differences in intention to stay for principals by additional principal characteristics. Findings showed no difference in intention to stay by prior experience as a principal in Montana. While only 56 percent of principals with a specialist degree or doctorate reported that they intended to stay, the difference was not statistically significant compared to principals with a master's degree. There were no noticeable differences by commute time for principals' intention to stay (figure C6).

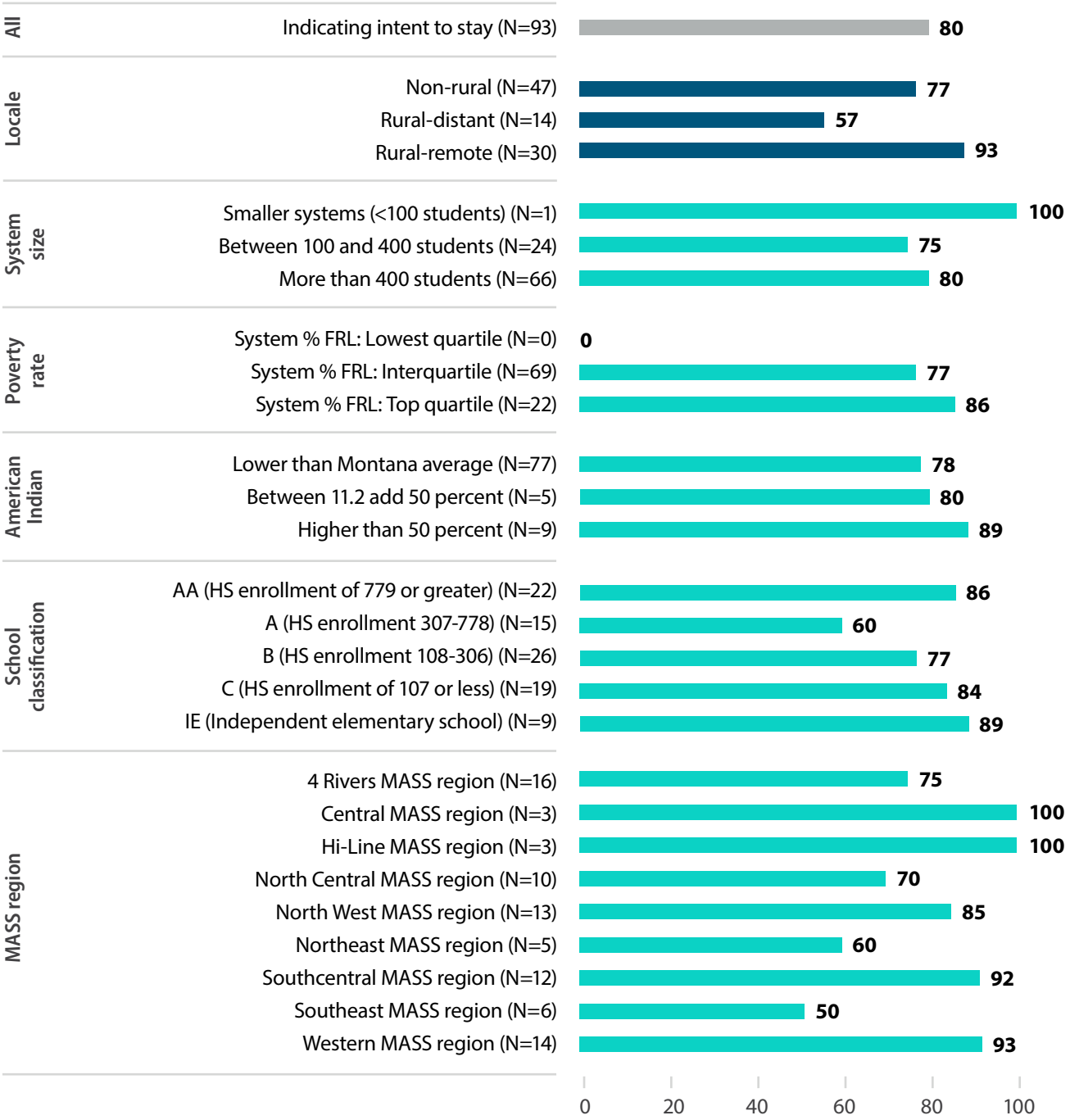
Figure C6. Principal intention to stay did not vary significantly by prior experience in Montana, highest level of education, or commuting time (percent)



Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

We examined intention to stay for principals by school system characteristics. We found that the lowest intention to stay was in rural-distant districts, with 57 percent of principals reporting they would stay, compared to 77 percent in non-rural districts, and 93 percent in rural-remote school systems (with the difference between rural-remote and non-rural school systems being statistically significant at the 5 percent level). There were no statistically significant differences by school system size, or the composition of the student body based on FRL or American Indian status. We observed differences in principal intention to stay in position by school classification and MASS region, but these differences were not statistically significant due to the small sample sizes (figure C7).

Figure C7. Principal intention to stay varied significantly by school system rurality, but did not vary by other system-level characteristics (percent)

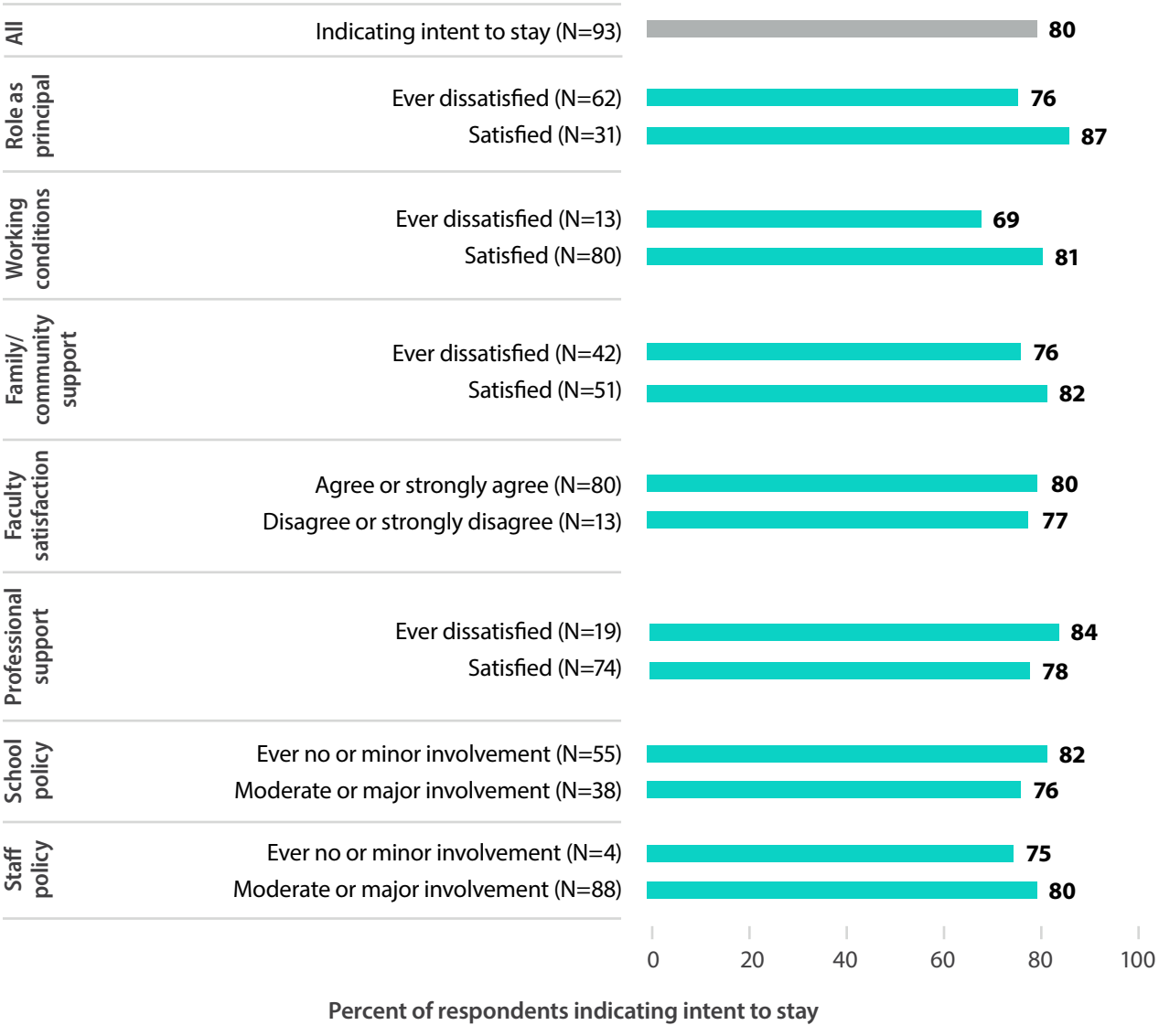


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

We examined principals' intention to stay in their position by various indicators of their satisfaction. The largest differences in magnitude for intention to stay in position were for the working conditions measure: 69 percent of principals who indicated that they were dissatisfied with working conditions also indicated they intended to stay in their position, as compared to 81 percent of principals who were satisfied with the working conditions. However, this difference was not statistically significant. While we observed differences in other subgroups, they were small in magnitude and none were statistically significant (figure C8).

Figure C8. Principal intention to stay did not vary significantly by various indicators of principal satisfaction (percent)

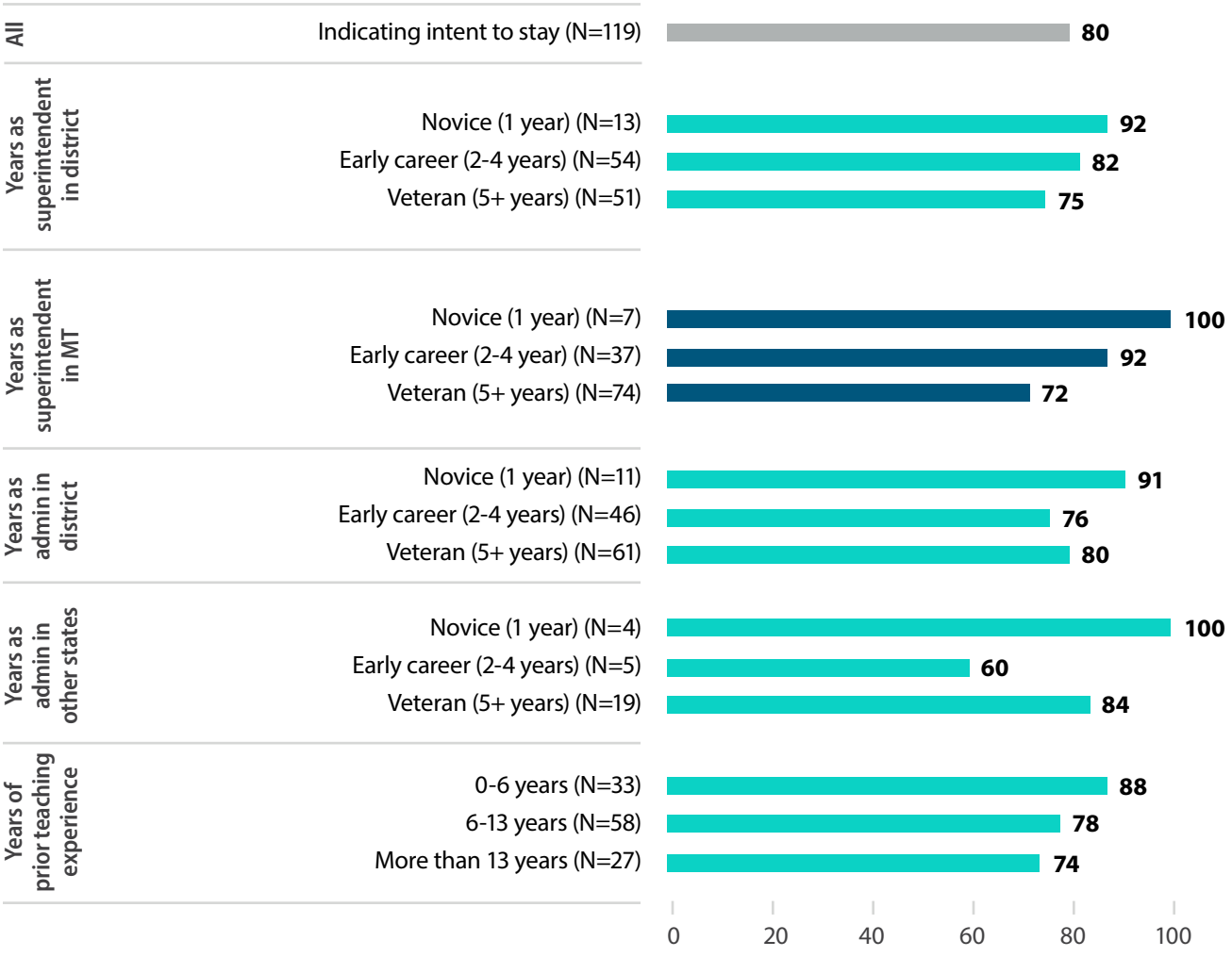


Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Superintendent intention to stay in position, by superintendent and school system characteristics

We found that 80 percent of superintendents reported that they intend to stay in their position next year. While we see differences in intention to stay in their position by tenure, measured in various ways, the only difference that was statistically significant was experience as a superintendent in Montana: While 72 percent of veteran Montana superintendents intended to stay in their position, the percentage was much higher for novice Montana superintendents (100 percent) and early career Montana superintendents (92 percent). Other subgroup differences were not statistically significant (figure C9).

Figure C9. Superintendent intention to stay varied significantly by experience as a superintendent in Montana and did not vary by other measures of tenure (percent)

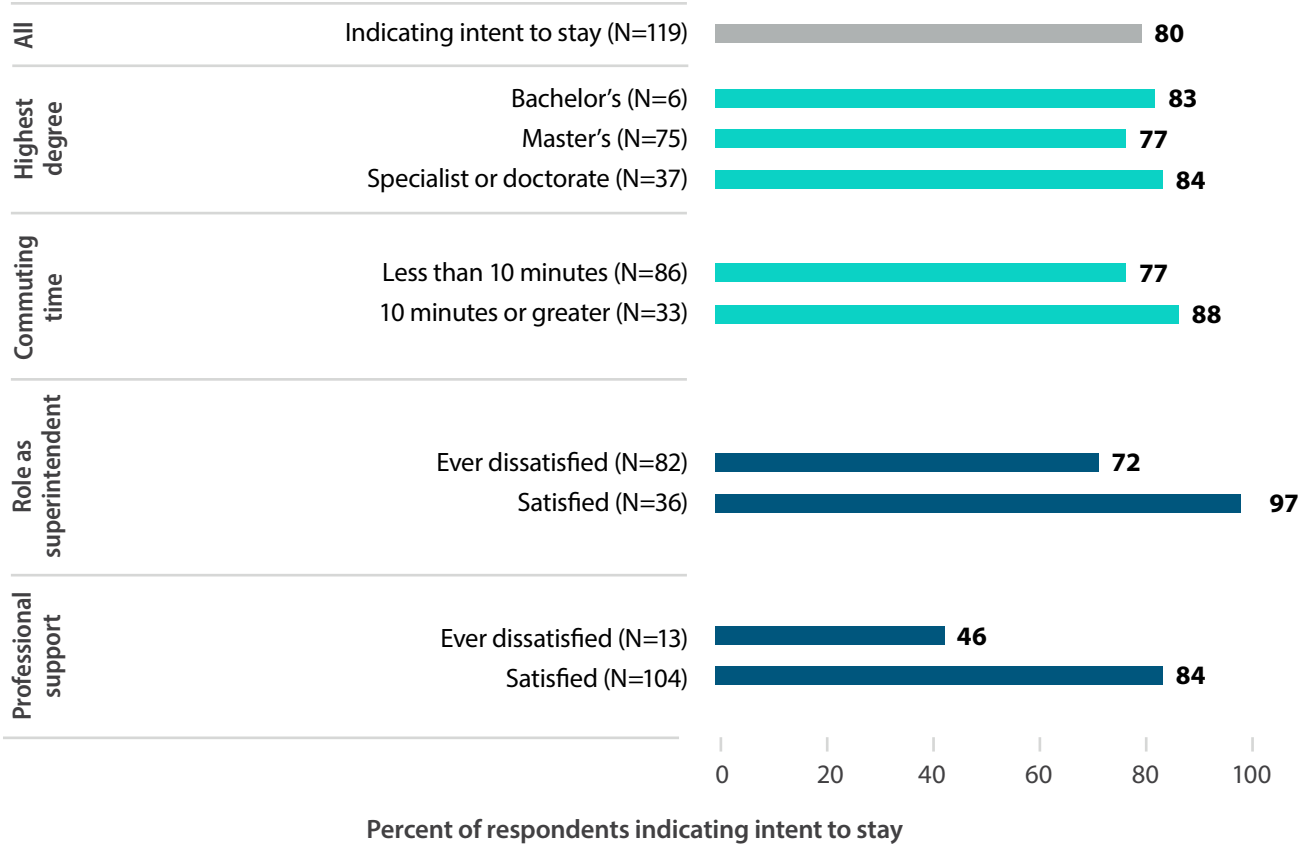


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

We examined differences in intention to stay for superintendents by education level, commute time, and perceptions. Findings showed no statistically significant differences by education level or commute time. However, there were large and statistically significant differences by satisfaction in their role and satisfaction with professional support, with satisfied superintendents for both measures much more likely to report that they intend to stay in their position (figure C10).

Figure C10. Superintendent intention to stay varied significantly by satisfaction in role and satisfaction with professional support (percent)

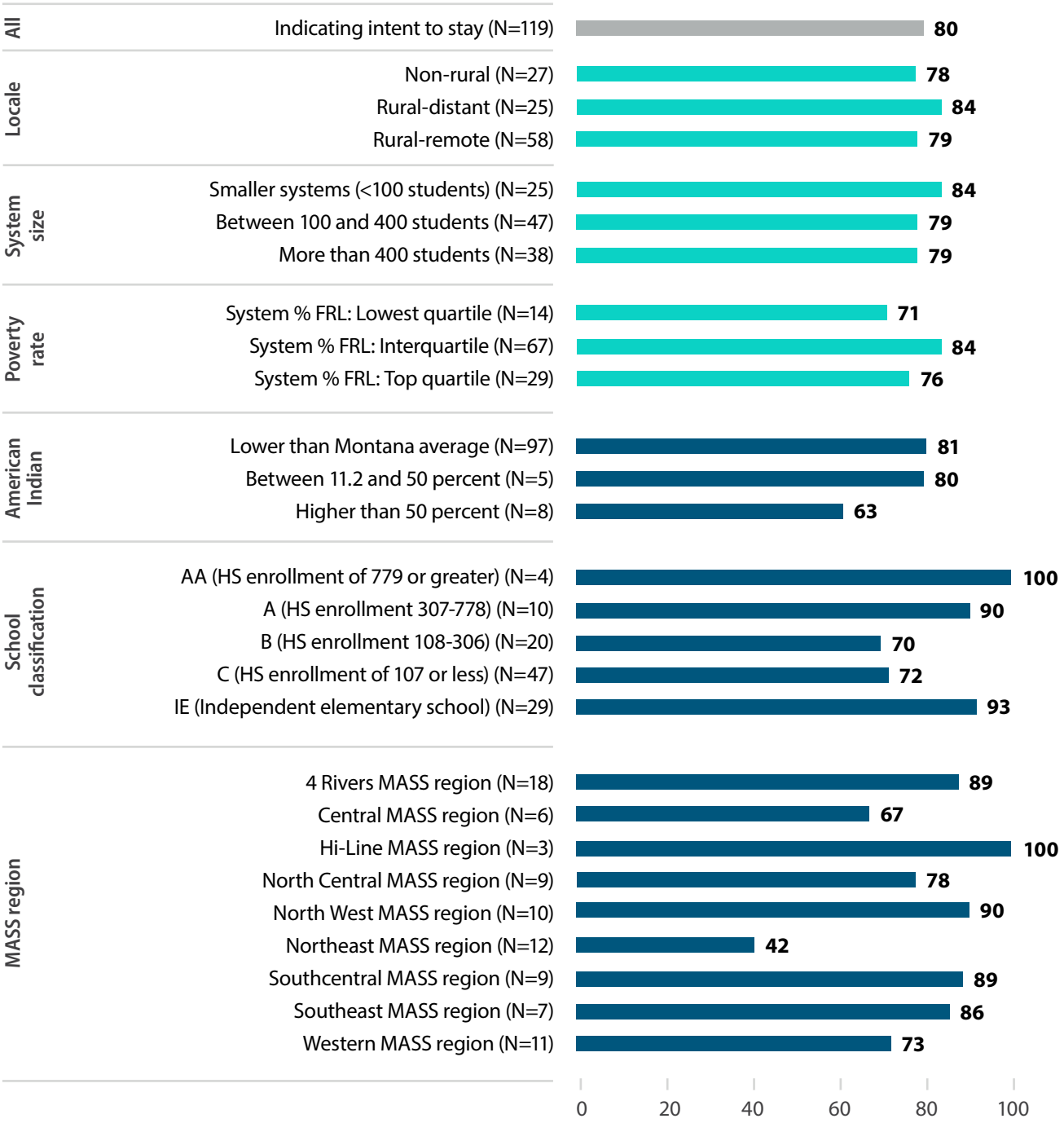


Notes: Dark blue shading denotes statistically significant differences ($p<.05$) within a subgroup.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Finally, we examined superintendents' intention to stay in their position by school system characteristics. Differences were small and not statistically significant by school system rurality, school system size, and student FRL percentage. We found that superintendents in schools with more than 50 percent American Indian students were less likely to report they would stay in their position, although there were small samples for this subgroup. We also see differences by school classification and MASS region, with superintendents in the Northeast and Central MASS region the least likely to report that they intended to stay in their position (figure C11).

Figure C11. Superintendent intention to stay varied significantly by school demographics, classification, and Montana Association of School Superintendents (MASS) region (percent)



Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Top factors that influenced teachers to accept position

Table C10 presents the top factors in teachers accepting their position, ordered by the percentage of teachers who selected that factor as one of their top three. For teachers, the top three factors were location, match with grade level or subject area preference, and salary.

Table C10. Top factors in teachers choosing to accept their position

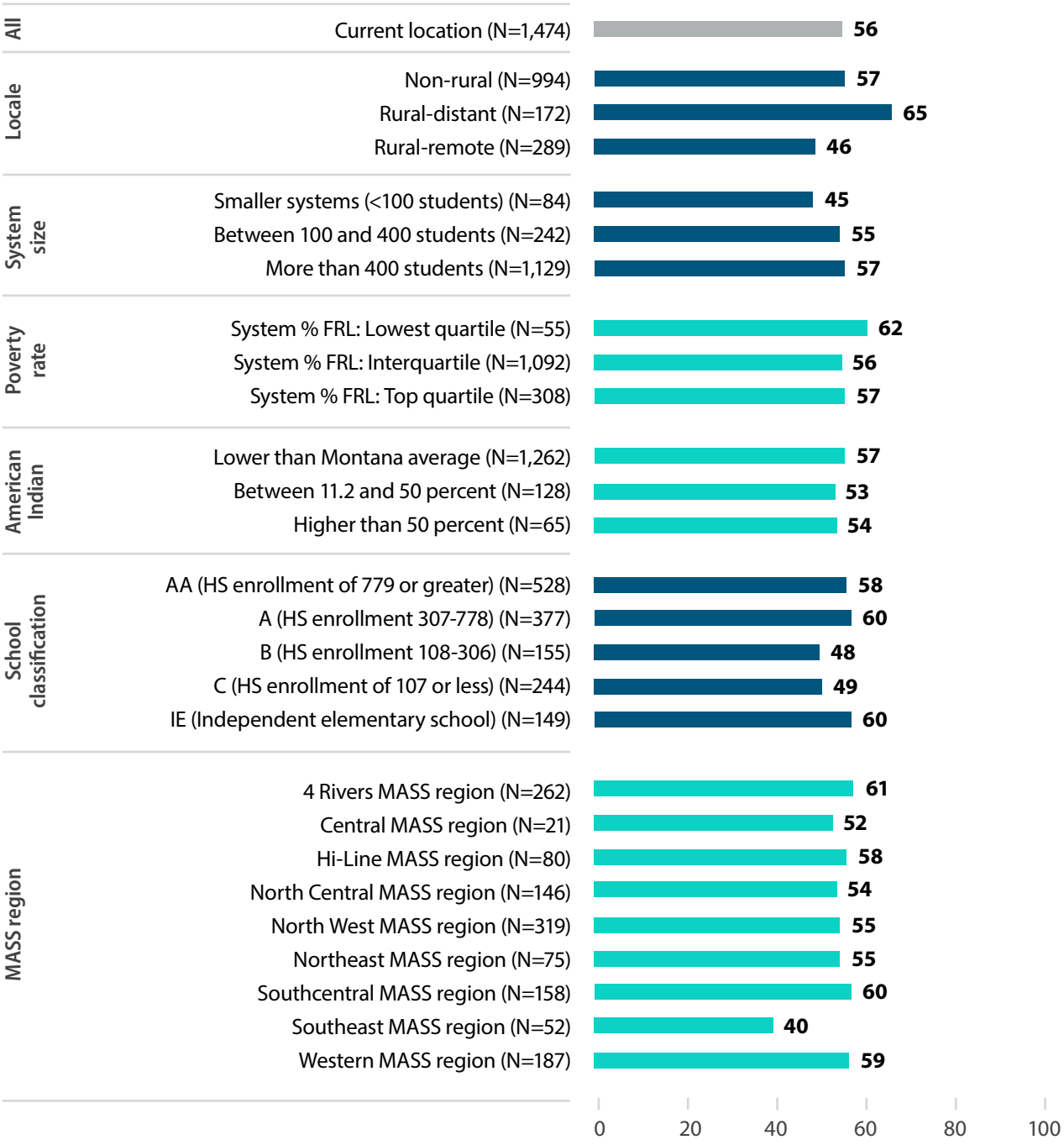
Factor associated with accepting position	Mean (percent)
Current location: school is where I live	56
Match with grade/subject preference	34
Salary	29
Close to where I grew up	23
School reputation	16
Spouse/partner preference	14
Benefits	13
School or class size	13
Student teaching experience in district	12
Access to outdoor recreation	11
Colleagues	8
Community/school demographics	6
Cost of living in the community	4
Close to where I went to college	4
Close to large population center	4
Loan forgiveness offers	3
Access to affordable housing	3
Experience during recruitment process	2
Reputation for safety/friendliness	2
District career pathways	2
Quality of PD offered	1
People my age in the community	1
Healthcare in community	1
Access to restaurants/shopping	0

Note: Sample size = 1,474.

Source: Authors' analysis of the 2017/18 Montana Educator Survey.

As mentioned above, for teachers, the top factor in accepting their position was the location of the school in relationship to where they lived, with 56 percent of respondents listing this option as one of the top three factors. We compared across school system characteristics what percentage of teachers listed this option in their top three. While we observed some differences across subgroups, the only statistically significant differences were for rural-remote versus non-rural school systems (with more non-rural teachers listing location in their top three), for small versus large school systems (with more teachers in large school systems listing location in their top three), and for class B and C school systems as compared to class AA school systems (with more teachers in AA school systems listing this option in their top three). All these differences were in the 9 to 12 percentage point difference range (figure C12).

Figure C12. The top factor in teachers accepting their position was the location of the school system, with significant variation by rurality, size, and classification (percent)

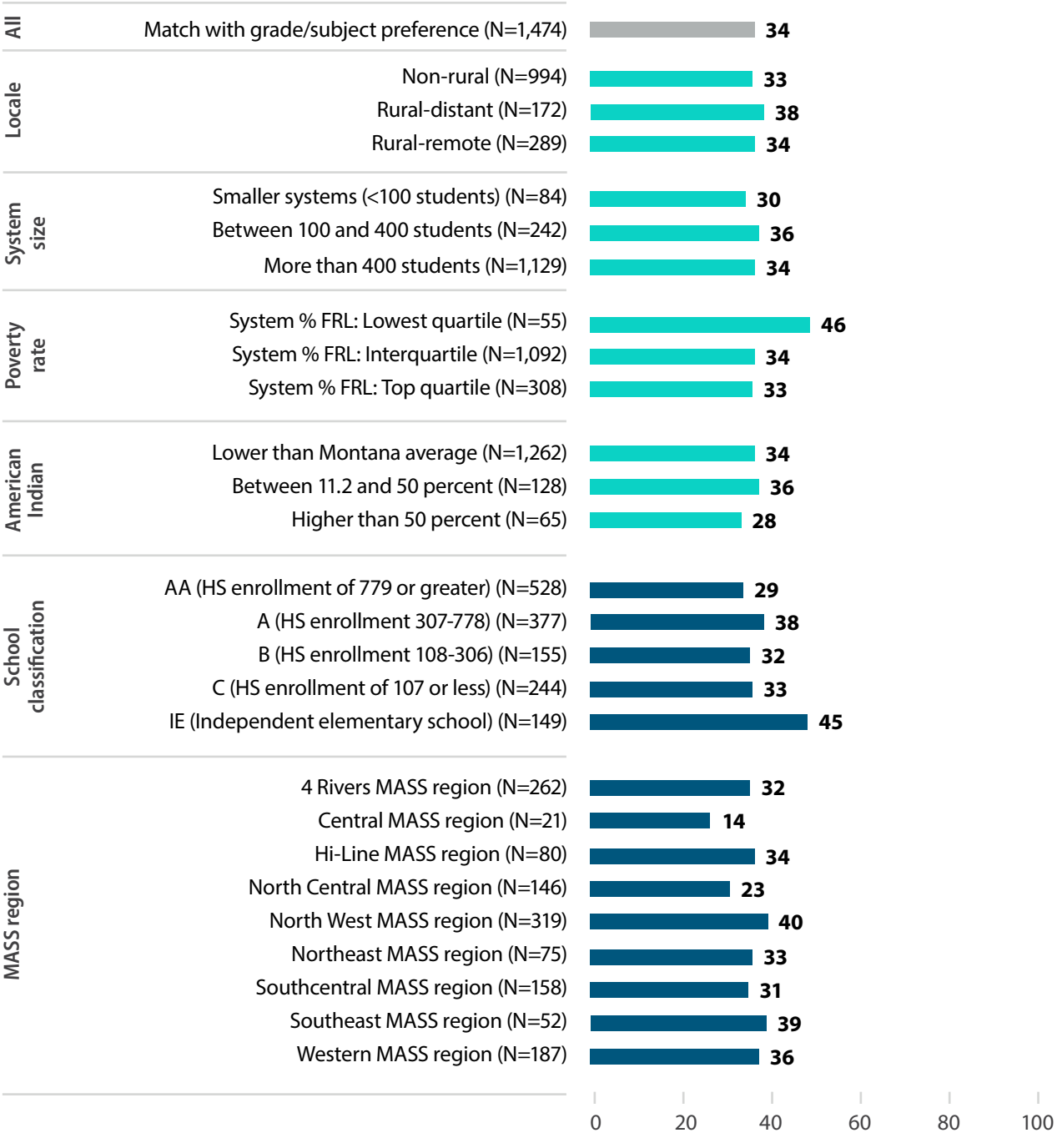


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

The second most common factor listed by teachers as the reason they accepted their position was the match in the position to their grade level or subject area preference, which was listed by 34 percent of respondents. The differences by subgroup were not statistically significant for rurality, system size, student FRL, or American Indian percentage. For school classification, the difference between teachers in A and IE schools versus AA schools was statistically significant at the 5 percent level, with both A and IE teachers more likely to list match with grade/subject preference. In comparing across MASS regions, we see that teachers in the Central and North Central regions were much less likely to list this factor, as compared to teachers in the North West region, and these differences were statistically significant (figure C13).

Figure C13. The second most common factor in teachers accepting their position was the match in position to their grade level or subject area preference, with significant variation by school classification and MASS region (percent)

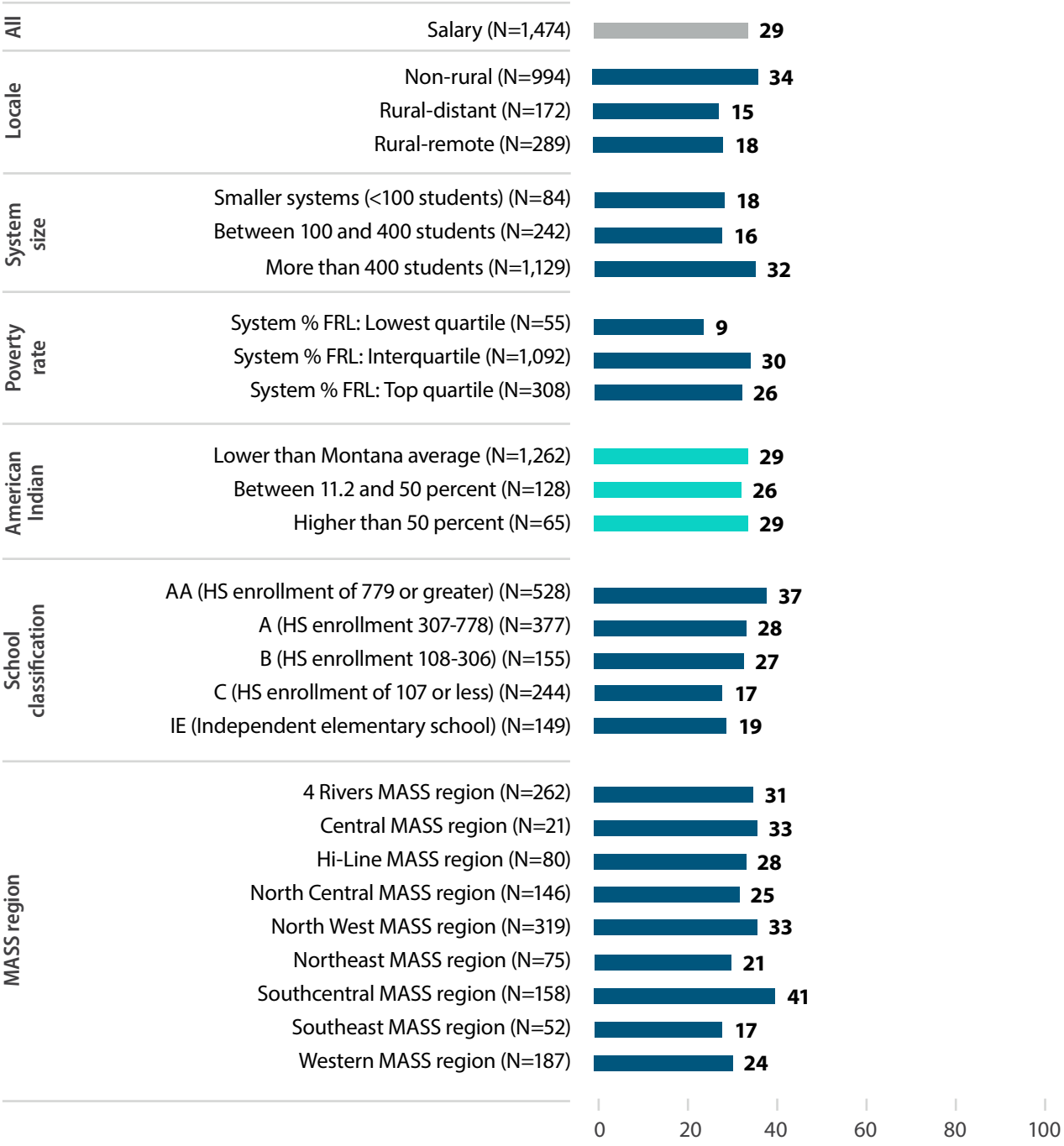


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

The third most common factor for accepting their teaching position was salary, which was mentioned by 29 percent of teachers. There were large and statistically significant differences (at the 5 percent level) by several school system characteristics. First, teachers in non-rural schools were much more likely to list this factor (34 percent) compared to teachers both in rural-distant schools (15 percent) and in rural-remote schools (18 percent). Similarly, teachers in large school systems (more than 400 students) were much more likely to list this factor (32 percent) compared to teachers in small school systems (equal or fewer than 100 students) (18 percent) and medium-sized school systems (more than 100 and fewer than 400 students) (16 percent). The differences by FRL were also statistically significant, with only 9 percent of teachers listing salary as a factor in low-FRL school systems, as compared to 30 percent in interquartile-FRL school systems, and 26 percent in high-FRL school systems. Teachers in AA school systems were much more likely to list salary as a factor as compared to teachers at school systems in other classification levels, and there were large and statistically significant differences by MASS region, with teachers in the North West and Southcentral regions most likely to list salary as a factor (figure C14).

Figure C14. The third highest factor listed by teachers in accepting their position was salary, with significant variation by rurality, school system size, school system poverty rate, school system classification, and MASS region (percent)



Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and Common Core of Data from the 2016/17 school year.

Top factors that influenced principals to accept their position

Table C11 summarizes the top factors reported by principals in accepting their position, ordered by most to least commonly marked as a top three factor by the respondent. The top factors for principals were location of the school system, prior experience at the school or district, and salary. Housing availability, healthcare, and cost of living were not commonly listed factors.

Table C11. Principal-listed top factors in accepting position

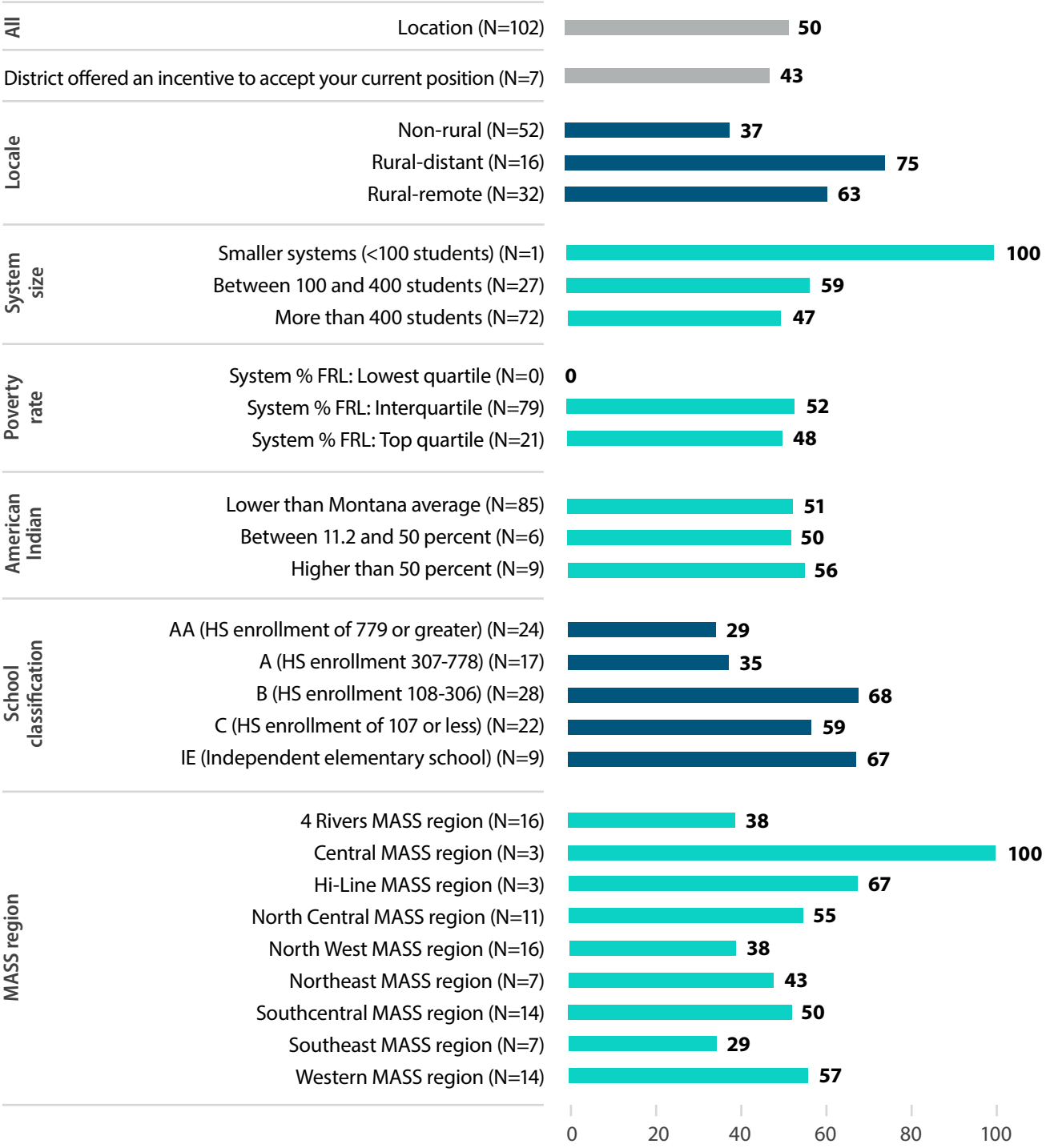
Factor associated with accepting position	Mean (Percent)
Location	50
Prior experience at this school or district	44
Salary	35
District reputation	29
Quality of colleagues/staff	28
Benefits	20
Spouse/partner preference	13
School size	11
Community/school demographics	10
School facilities	7
Career pathways within the district	6
Experience during the recruitment process	5
Cost of living in the community	4
Housing availability	1
Healthcare in community	0

Note: Sample size=102.

Source: Authors' analysis of the 2017/18 Montana Educator Survey.

For principals, the most common factor reported in accepting their position was the location of the school relative to where the respondent lived, with 50 percent of principals mentioning this factor as one of their top three. Forty-three percent of principals who were offered an incentive to accept their current position listed location as a factor. There were statistically significant differences by rurality, with 75 percent of principals in rural-distant school systems reporting location as a top three factor, compared to only 37 percent of principals in non-rural school systems and 63 percent of principals in rural-remote school systems. When examining school classification, we see that principals in B and C schools were more likely to list location as compared to principals in AA schools, with these differences statistically significant at the 5 percent level. While there are differences by MASS region, we caution that sample sizes are too small to draw inferences from these findings. Differences for other school system characteristics were not statistically significant across subgroups (figure C15).

Figure C15. Location of the school system was the top factor in principals accepting their position, with significant variation by rurality and school classification (percent)

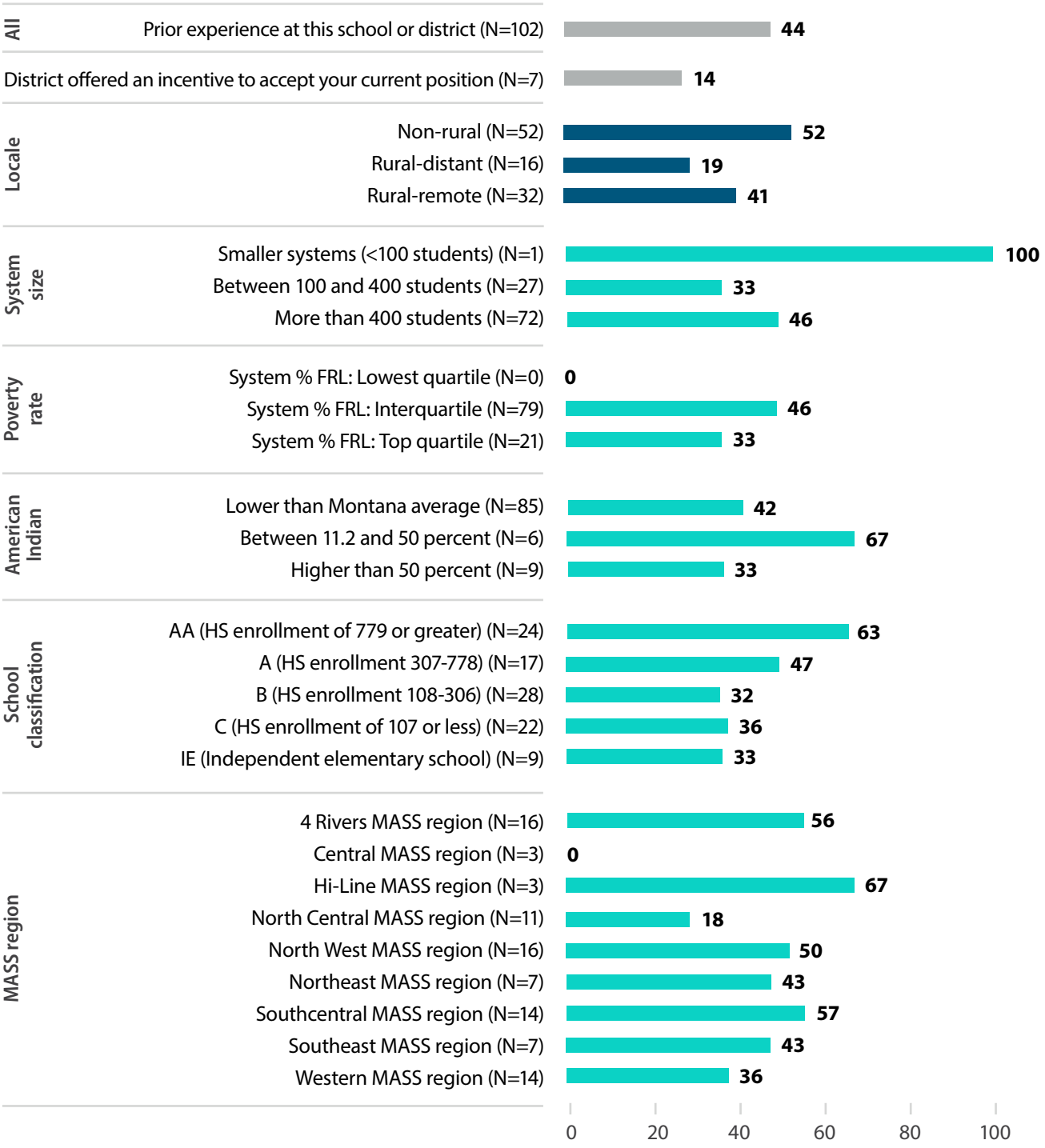


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

The second most common top factor listed by principals in their decision to accept their position was prior experience in the district, which was mentioned by 44 percent of respondents. When examining subgroups, we see that principals in non-rural school systems were more likely to list this factor compared to principals in rural-distant school systems, and this difference was statistically significant at the 5 percent level. Differences for other school system characteristics were not statistically significant. Principals in AA school systems were more likely to list this factor as compared to principals in other school system classifications, but only the comparison to class B school systems was statistically significant. We see differences across MASS regions, but the sample sizes for each region were too small to draw inferences (figure C16).

Figure C16. Prior experience in the district was the second most common factor in principals accepting their position, with significant variation by rurality (percent)

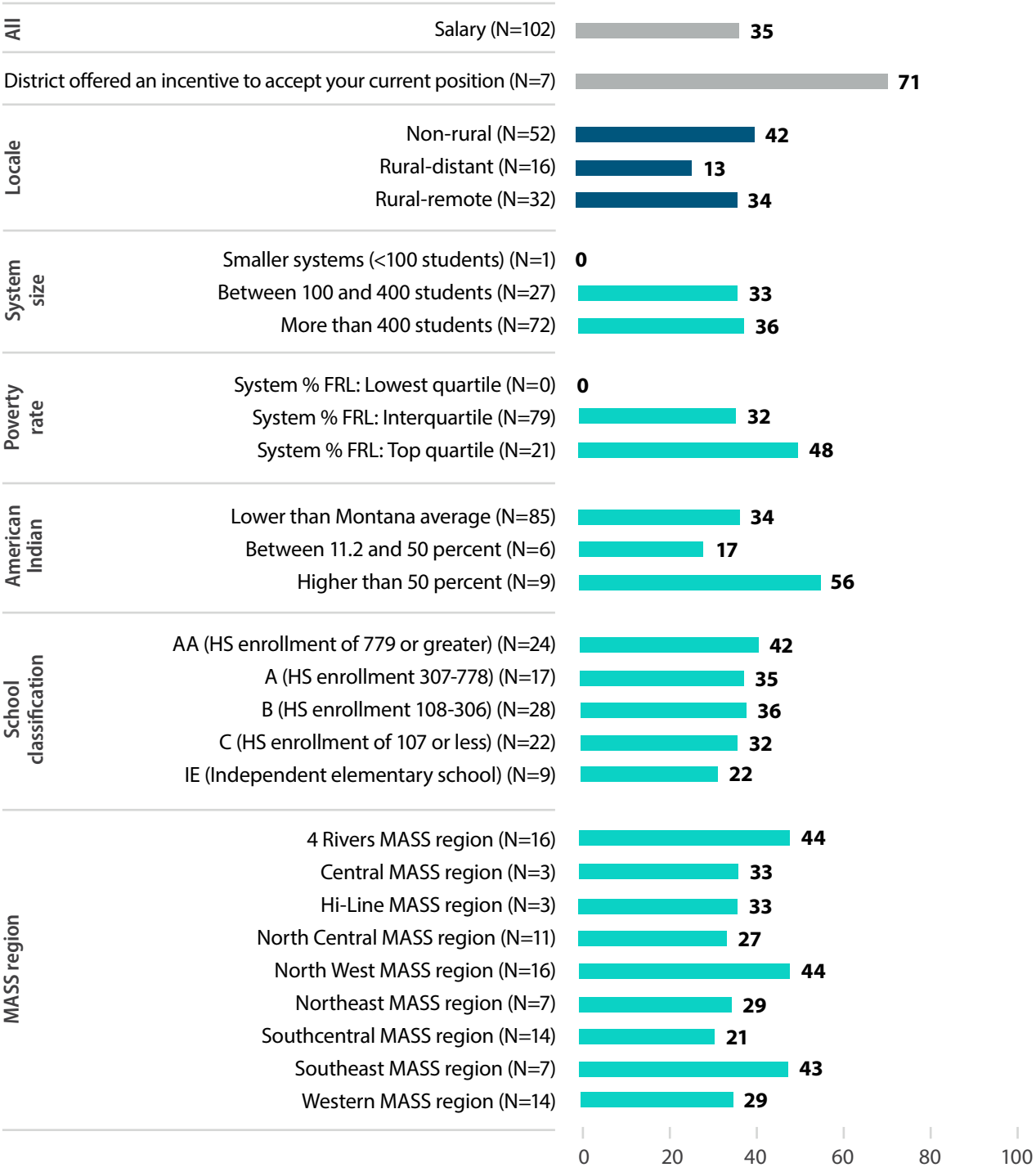


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

The third most common factor listed by principals was salary, with 35 percent of principals listing this factor. While we found some differences by subgroups, the only difference that was statistically significant was the comparison between rural-distant and non-rural principals, with 42 percent of non-rural principals listing this factor, compared to only 13 percent of rural-distant principals. The remaining subgroup differences were not statistically significant (figure C17).

Figure C17. Salary was the third most common factor in principals accepting their position, with significant variation by rurality (percent)



Notes: Dark blue shading denotes statistically significant differences ($p<.05$) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Top factors that influenced superintendents to accept position

For superintendents, the top three factors in choosing to accept their position were location of the school system, district size, and salary. Career pathways, cost of living, and healthcare in the community were never or infrequently listed among the top three (table C12).

Table C12. Superintendent-listed top factors in accepting position

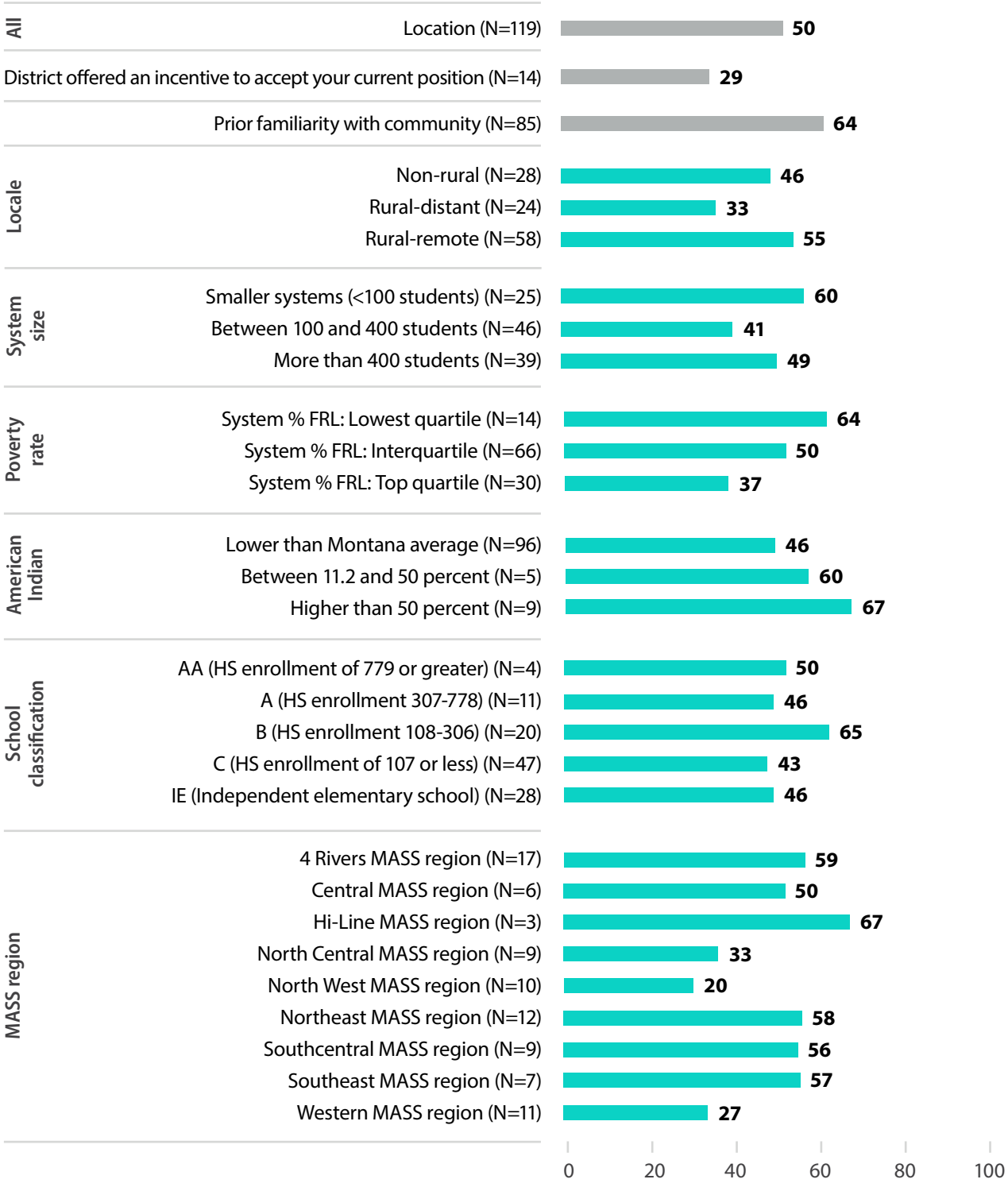
Factor associated with accepting position	Mean (Percent)
Location	50
District size	27
Salary	26
District or school reputation	21
Prior experience at this school or district	19
Spouse/partner preference	19
Community/district demographics	15
Quality of colleagues/staff	13
Benefits	13
Experience during the recruitment process	4
Healthcare in community	1
Cost of living in the community	0
Career pathways within the district	0

Note: Sample size=119.

Source: Authors' analysis of the 2017/18 Montana Educator Survey.

The top factor reported by superintendents for accepting their position was location, which was marked by 50 percent of the 119 respondents. While we see some differences by rurality, system size, percentage of students qualifying for free or reduced-price lunch, and percentage of American Indian students, these findings were not statistically significant. We also see differences by school classification and MASS region, but sample sizes were too small to draw inferences (figure C18).

Figure C18. The location of the school system was the most common factor in superintendents accepting their position (percent)

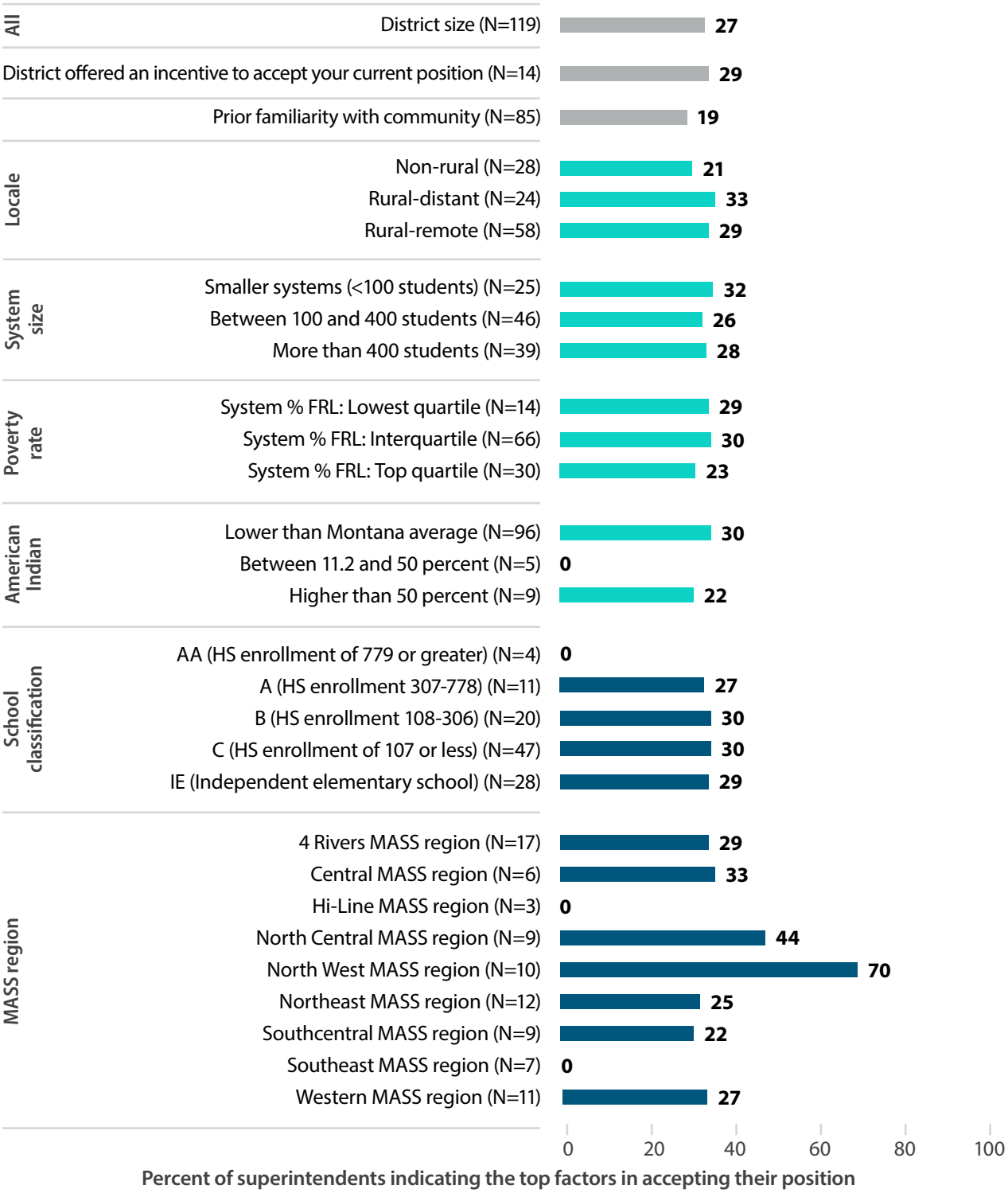


Note: FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

The next most common factor reported by superintendents in accepting their position was district size, which was reported by 27 percent of respondents. Differences were not statistically significant by rurality, system size, percentage of students qualified for FRL, or percentage of American Indian students. While district size was not reported by any superintendent as a factor in AA schools, superintendents in B, C and IE schools did report this factor, at around 30 percent, and the difference between AA and the other school classifications was statistically significant. Large, statistically significant differences also existed by MASS region, with 70 percent of superintendents reporting this factor in the North West MASS region, but none in the Hi-Line or Southeast regions (figure C19).

Figure C19. District size was the second most common factor in superintendents accepting their position, with significant variation by school classification and MASS region (percent)

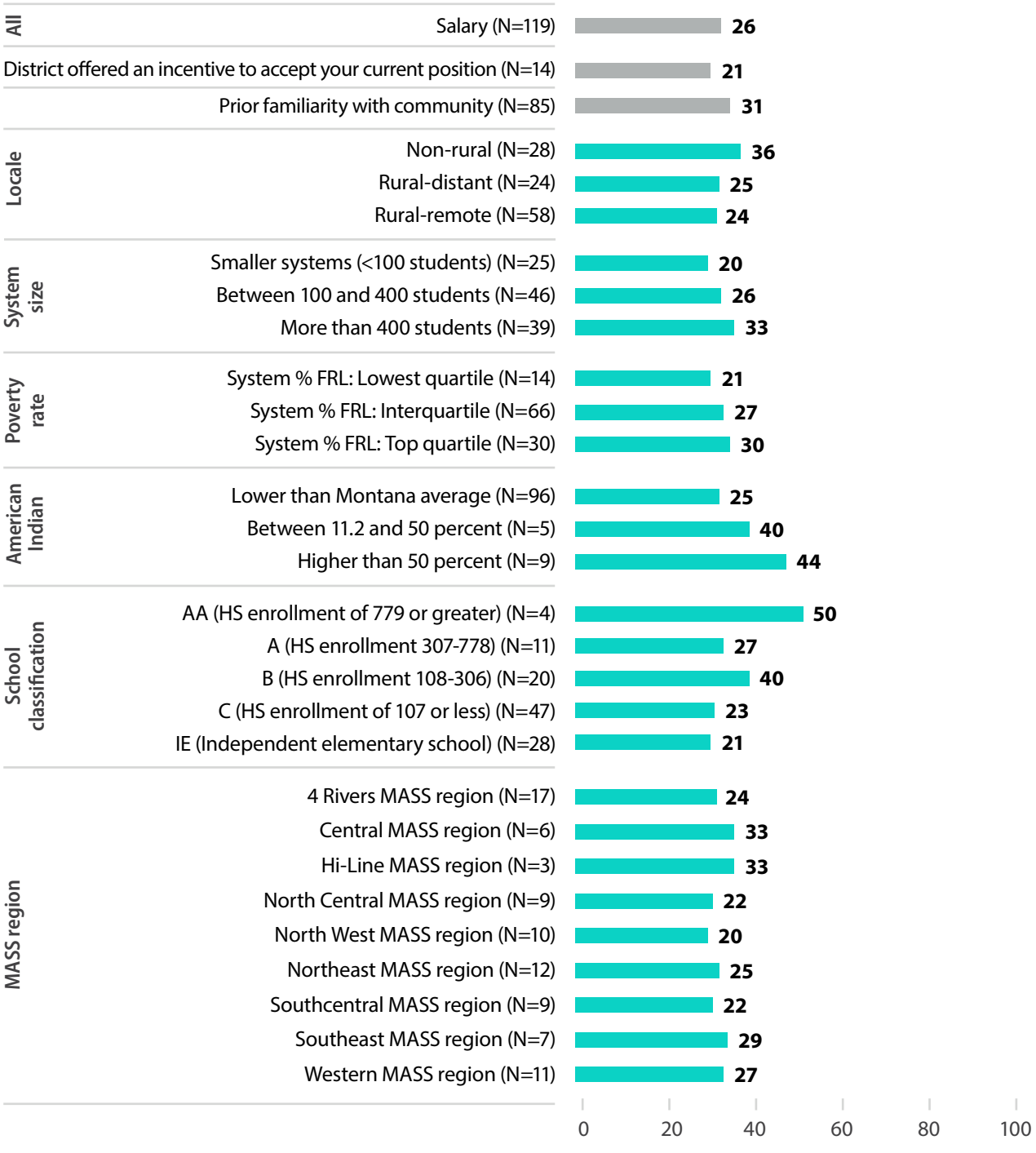


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

The third most common reason superintendents accepted their position was salary, with 26 percent of respondents listing this factor in their top three. None of the differences by subgroup were statistically significant for this factor (figure C20).

Figure C20. Salary was the third most common factor in superintendents accepting their position (percent)



Note: FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Principals' most common barriers to hiring teachers

Principals were asked to list the most prominent barriers to hiring teachers. The most common responses were having a sufficient number of applicants, finding teachers with the right endorsements/licensure, and availability of housing in the community (table C13).

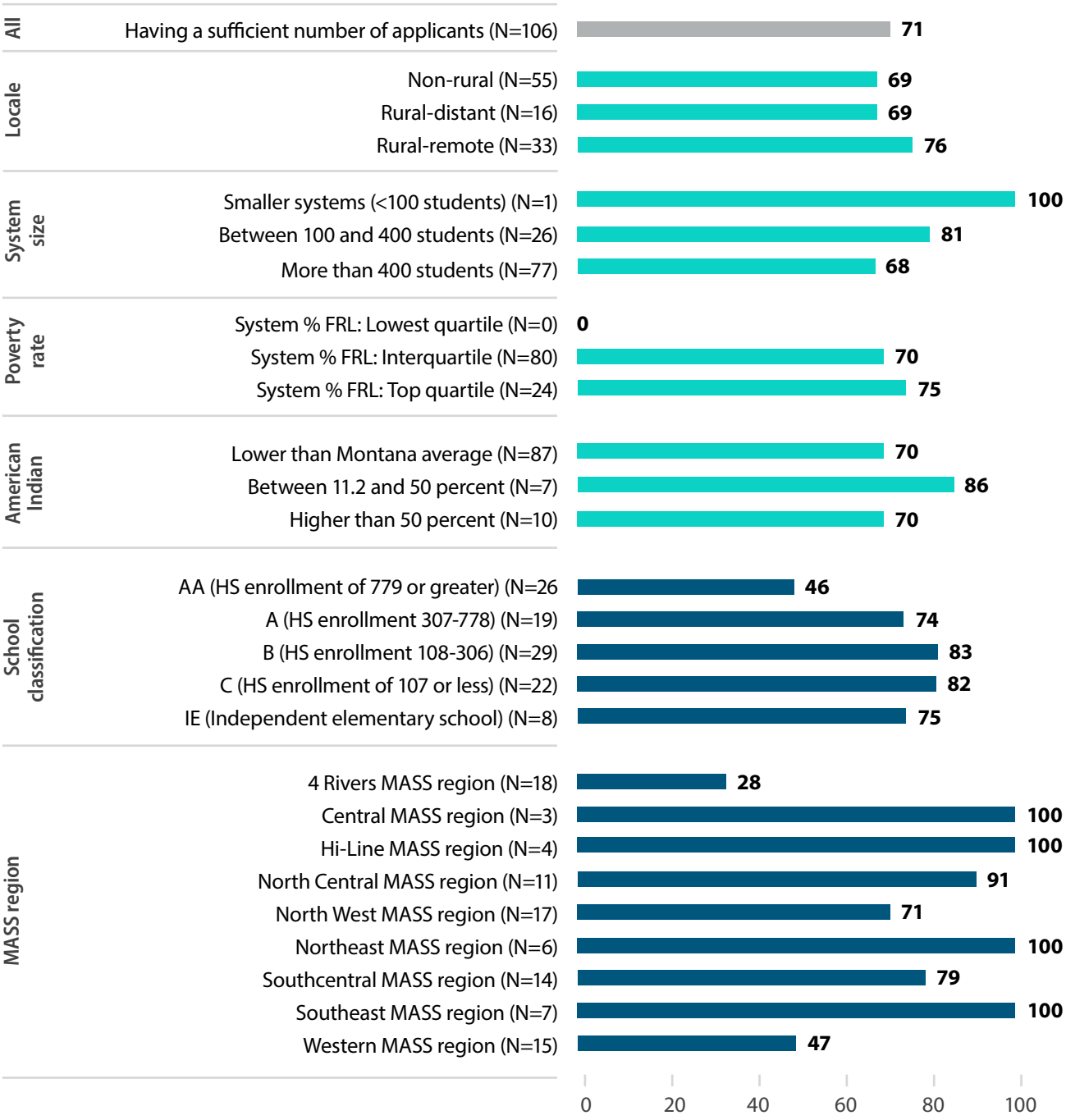
Table C13. Principals' most common barriers to hiring teachers

Barriers to hiring	Mean (Percent)	N
Having a sufficient number of applicants	71	106
Finding teachers with the right endorsements/licensure	68	107
Availability of housing in the community	60	106
Sufficient funding to offer a competitive salary	54	106
Sufficient funding to hire new teachers	53	105
Location of our district	37	105
Benefits compared to other districts	35	106
School facilities	19	104

Source: Authors' analysis of the 2017/18 Montana Educator Survey.

Seventy-one percent of respondents listed having enough applicants as the top barrier to hiring teachers. While there were no statistically significant differences by school system locale, size, or demographic composition, we found statistically significant results by school classification. Specifically, significantly fewer principals listed this barrier to hiring in AA schools (46 percent), compared to B and C schools (83 percent and 82 percent, respectively). There were also statistically significant differences by MASS region, although given the low number of respondents in each region, inferences should be made with caution (figure C21).

Figure C21. The top barrier to hiring teachers, as reported by principals, was an insufficient number of applicants, with significant variation by school classification and MASS region (percent)

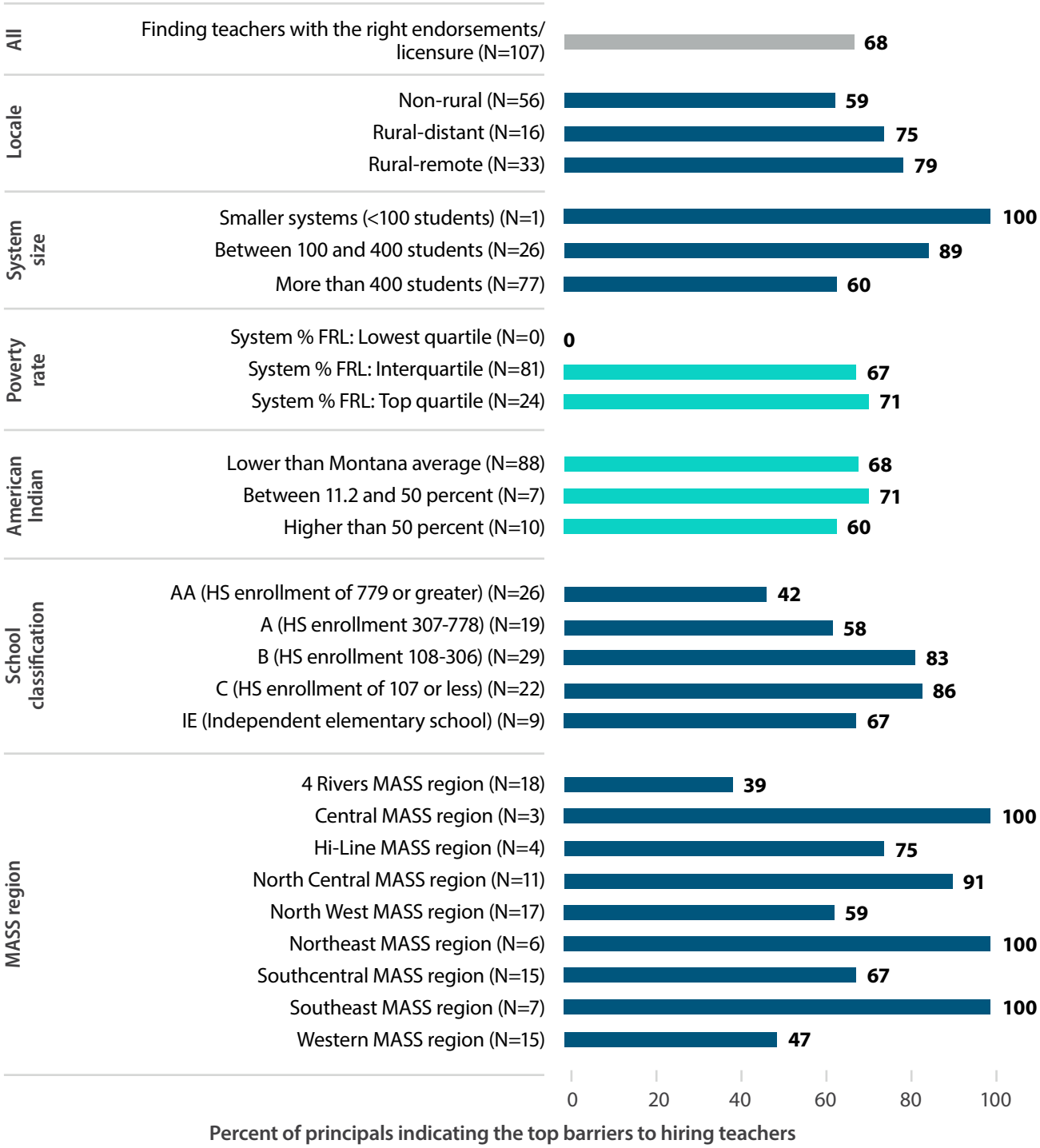


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

The next most common barrier to hiring teachers, as reported by principals, was finding teachers with the right endorsements/licensure, which was listed by 68 percent of respondents. Statistically significant differences existed by rurality and school system size, with principals in non-rural and larger schools less likely to list this barrier compared to principals in rural-remote and medium-size school systems, respectively. There were also statistically significant differences by school system classification and MASS region, with principals in class B and C school systems much more likely to list this barrier, as compared to AA school systems (figure C22).

Figure C22. The second most reported barrier to hiring teachers, as reported by principals, was finding teachers with the right endorsements or licensure, with significant variation by rurality, enrollment, school system classification, and MASS region (percent)

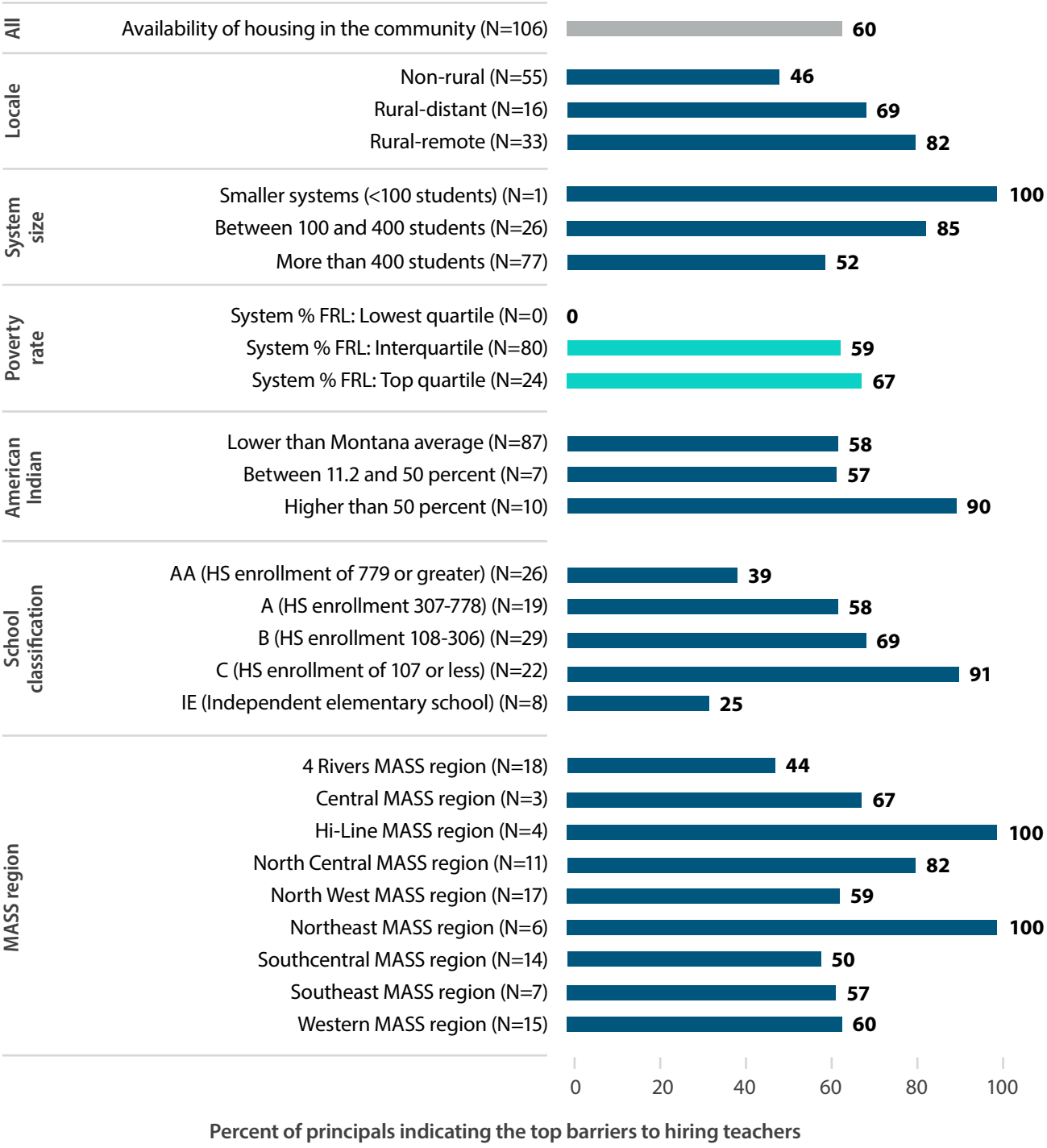


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

The third most common barrier to hiring teachers, as reported by principals, was the availability of housing in the community, with 60 percent of respondents listing this barrier. The pattern of statistically significant differences by subgroups mirrors the findings in the previous figure, with non-rural principals much less likely to list this barrier compared to rural-distant principals (46 percent versus 82 percent, respectively), and principals in large school systems less likely to list this barrier as compared to principals in medium school systems. This is the first barrier for which there was a large and statistically significant difference related to the percentage of American Indian students in a school system: 90 percent of principals in school systems with more than 50 percent of American Indian students listed this barrier. Large and statistically significant differences also existed by school classification and MASS region.

Figure C23. The third most reported barrier to hiring teachers, as reported by principals, was availability of housing in the community, with subgroup variation (percent)



Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Superintendents' most common barriers to hiring teachers

Superintendents were also asked about barriers to hiring teachers, and most commonly listed sufficient funding to offer competitive salaries, having a sufficient number of applicants, and finding teachers with the right endorsements/licensure.

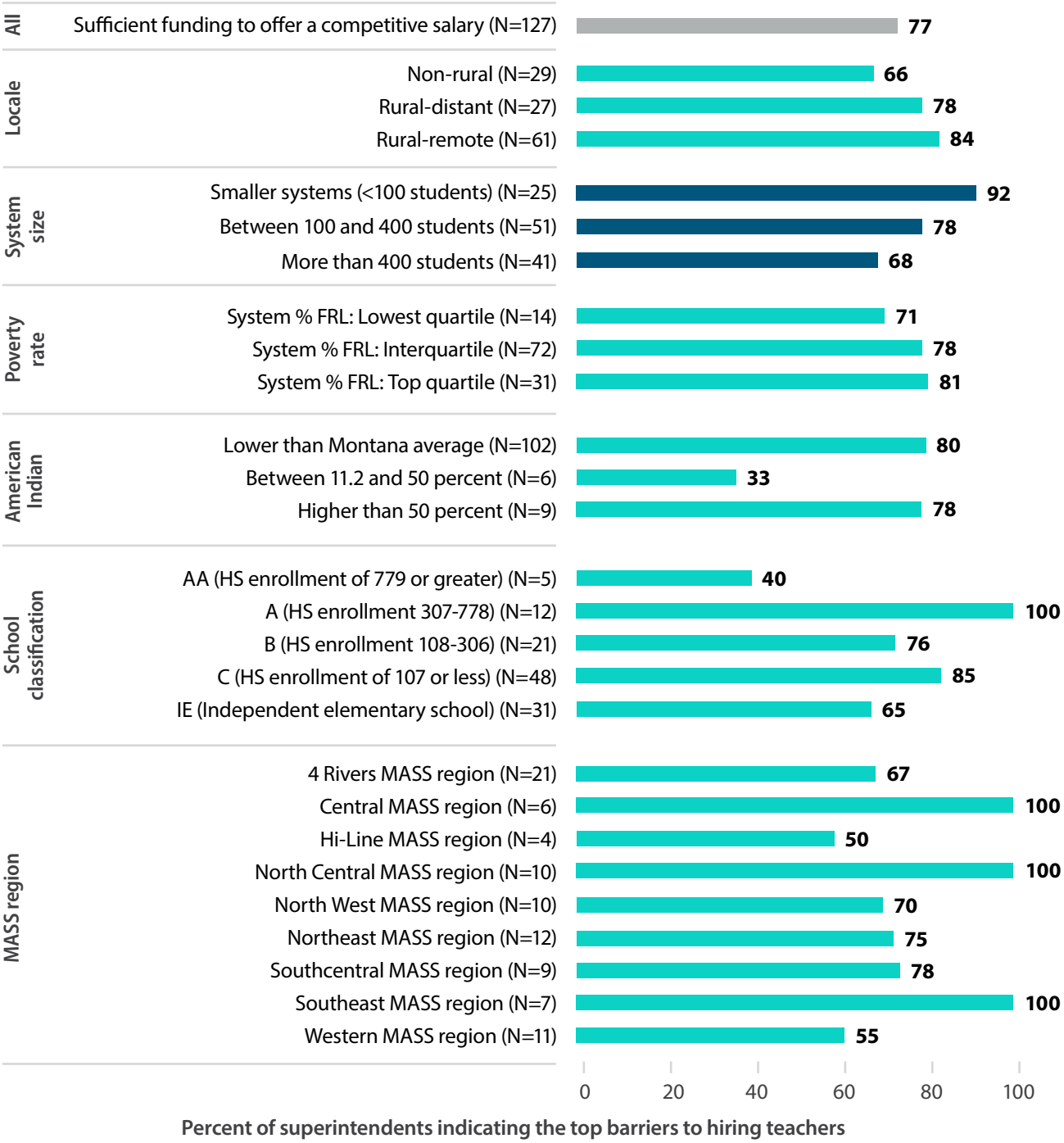
Table C14. Superintendents' most common barriers to hiring teachers

Variable	Mean (Percent)	N
Sufficient funding to offer a competitive salary	77	127
Having a sufficient number of applicants	76	128
Finding teachers with the right endorsements/licensure	76	127
Sufficient funding to hire new teachers	68	126
Availability of housing in the community	68	126
Location of our district	54	125
Benefits compared to other districts	50	127

Source: Authors' analysis of the 2017/18 Montana Educator Survey.

In terms of barriers to hiring, the largest proportion of superintendents indicated that sufficient funding to offer competitive salaries was a barrier (77 percent). The only statistically significant difference across subgroups was observed by school system size, with only 68 percent of superintendents in large school systems reporting this barrier, as compared to 92 percent of superintendents in small school systems (figure C24).

Figure C24. The top barrier to hiring teachers, as reported by superintendents, was having sufficient funding to offer a competitive salary, with significant variation by school system size (percent)

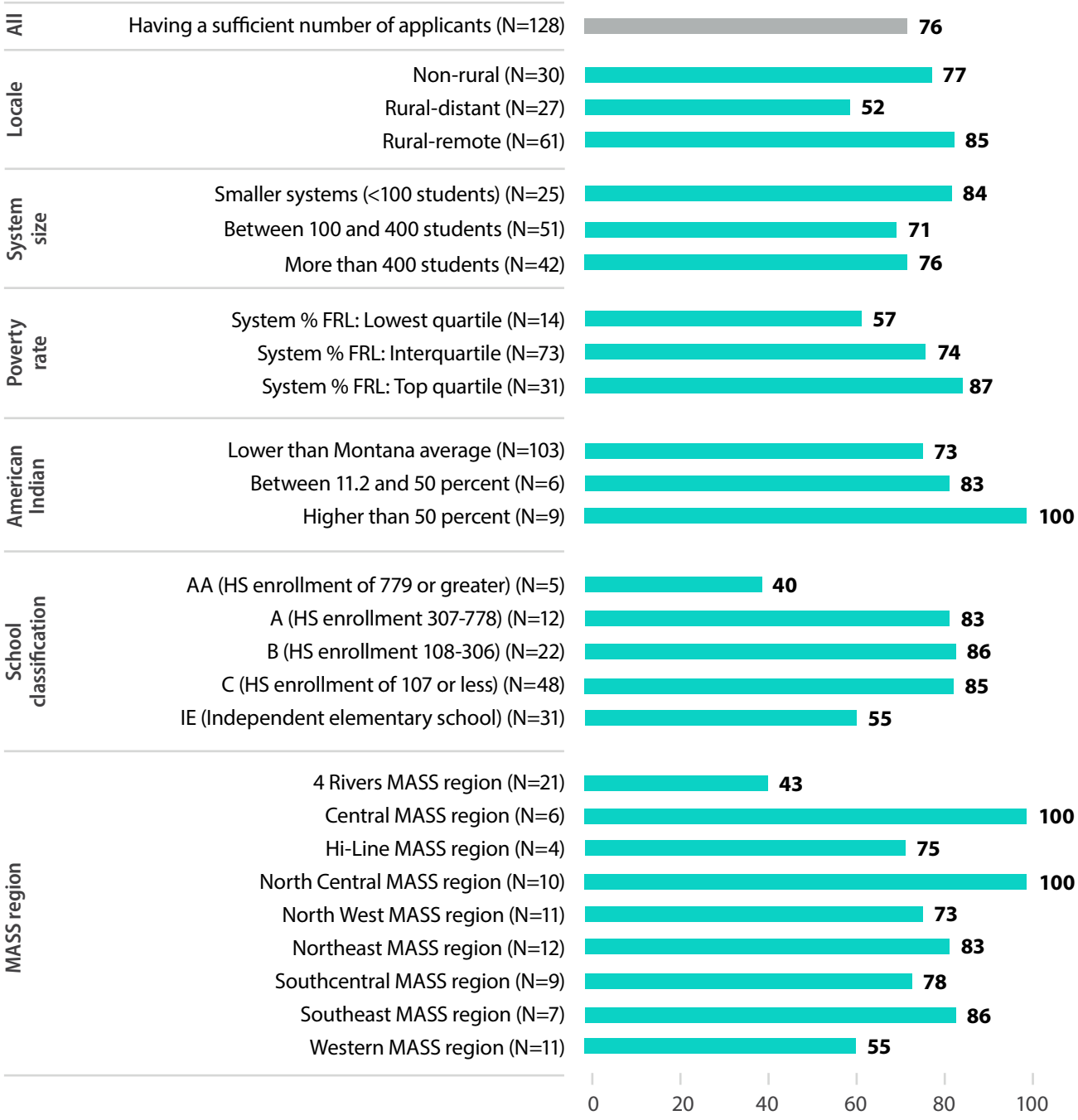


Notes: Dark blue shading denotes statistically significant differences (p<.05) within a subgroup; FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

The next most common barrier to hiring teachers, as reported by superintendents, was having a sufficient number of applicants, which was marked by 76 percent of respondents. There were no statistically significant differences in reporting this barrier by superintendents across school system subgroups (figure C25).

Figure C25. The second most reported barrier to hiring teachers, as reported by superintendents, was having a sufficient number of applicants (percent)

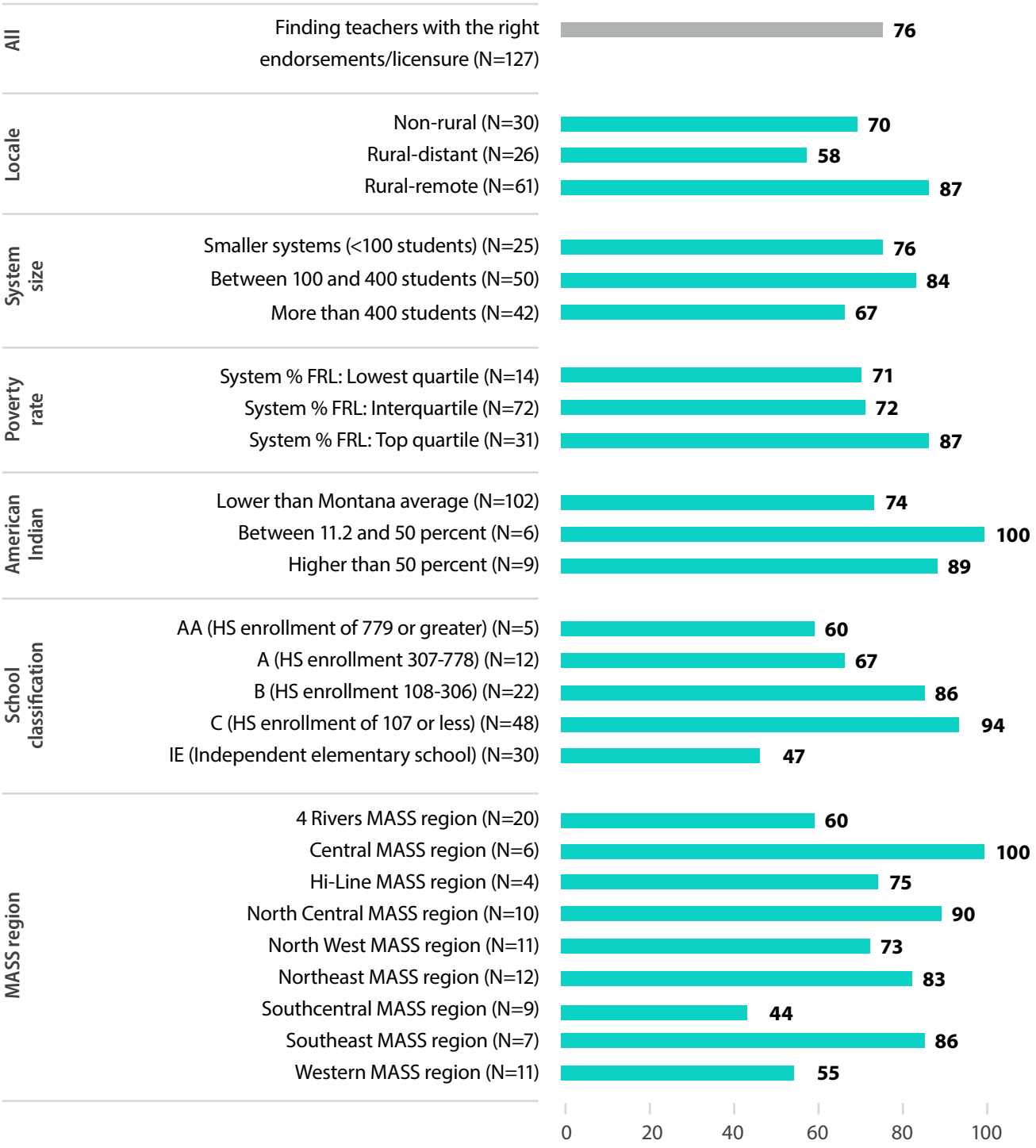


Note: FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.

Finally, the third most common barrier to hiring teachers, as reported by superintendents, was finding teachers with the right endorsements or licensure, which was reported by 76 percent of respondents. There were no statistically significant differences by school system subgroups (figure C26).

Figure C26. The third most reported barrier to hiring teachers, as reported by superintendents, was finding teachers with the right endorsements or licensure (percent)



Note: FRL denotes free or reduced-price lunch; MASS denotes Montana Association of School Superintendents.

Source: Authors' analysis of the 2017/18 Montana Educator Survey and data from the Common Core of Data for the 2016/17 school year.