THOMAS B.
FORDHAM
INSTITUTE
ADVANCING EDUCATIONAL EXCELLENCE

The Hidden Half:
School Employees Who Don't Teach

by Matthew Richmond

Foreword by Chester E. Finn, Jr.

Contents

Foreword

Why do American public schools spend more of their operating budgets on non-teachers than almost every other country in the world, including nations that are as prosperous and humane as ours? We can't be certain. But we do know this:

» The number of non-teachers on U.S. school payrolls has soared over the past fifty years, far more rapidly than the rise in teacher numbers. And the amount of money in district budgets consumed by their salaries and benefits has grown apace for at least the last twenty years.

» Underneath the averages and totals, states and districts vary enormously in how many non-teachers they employ. Why do Illinois taxpayers pay for forty staff per thousand pupils while Connecticut pays for eighty-nine? Why does Orange County, Florida (Orlando) employ eleven teacher aides per thousand students when Miami-Dade gets by with seven?

What accounts for such growth—and such differences? We don't know nearly as much as we'd like on this topic, but it's not a total mystery. The advent and expansion of special education, for example, obviously gave rise to substantial demand for classroom aides and specialists to address the needs of youngsters with disabilities. The widening of school duties to include more food service, health care, and sundry other responsibilities accounts for more.

But such additions to the obligations of schools are not peculiar to the United States and they certainly cannot explain big staffing differences from place to place within our country.

The present study shines a bright light on how school staffing has been changing on American shores, both nationally and by state. It deconstructs the category of "non-teacher" as well as current data allow, shows which types have increased the most, and illustrates how states and districts vary in staffing levels. It also examines whether factors such as the number of students with special needs

and a district's size or "urbanicity" are related to the number of non-teachers.

Though a study such as this does not fully explain *why* these patterns and variations have developed, it can highlight the dramatic numbers themselves and urge district and state decision makers to examine their own practices and ask tough questions about their priorities.

This isn't the first Fordham report to encourage such self-scrutiny. Two years ago, for example, we published Nate Levenson's pioneering look at special ed, *Boosting the Quality and Efficiency of Special Education*, which found that districts could improve the educational outcomes of youngsters with disabilities *and* save money by revising their staffing patterns (and making corollary changes).

Nor is Fordham alone in tugging at this important thread in the fabric of American education. For instance, a 2012 report from the Friedman Foundation found that over six decades starting in 1950, U.S. public schools increased their non-teaching positions by 702 percent (versus 96 percent for students and 252 percent for teachers).

At a time when budgets are tight and achievement weak, it's unthinkable not to consider what personnel shifts might strengthen both performance and efficiency.

Here's why contemporary education leaders should look carefully under this hood: school employees are the primary engines of student learning and they're also by far the largest category in district budgets. Indeed, at a time when budgets are tight and achievement weak, it's unthinkable not to consider what personnel shifts might strengthen both performance and efficiency.

Education leaders at every level have been paying plenty of attention to the quality, effectiveness, and costs of teachers. (As we write, for example, the federal Department of Education is unveiling an elaborate, if dubious, set of new policies and programs intended to make the distribution of "quality" teachers more equitable.) Why is so little attention paid to the "hidden half" of schools' staffing rosters? Isn't it about time? Past time?

This dysfunction attests to the longstanding heedlessness of education leaders (and analysts) regarding the costs and benefits of non-teaching personnel.

Widespread obliviousness to this topic is evident in today's woefully inadequate data. The national statistics obtainable from the U.S. Department of Education, for instance, are rich with information about school teachers and principals but crude and unhelpful when it comes to non-teaching personnel. For example, that agency's *Local Education Agency Universe Survey* reports that "other" staff accounted for 41 percent of all non-teaching staff at the district level in 2010. That's more than a million people. But what do they actually do? The federal definition for this huge but vague category of personnel is "all other staff who serve in a support capacity and are not included in the categories of central office administrative support, library support, or school administrative support." Illustrations range from bus drivers to security personnel to cafeteria workers. (A variant of the same federal definition adds plant maintenance staff.) Using such a generic, catch-all category may make it easier for district bean counters (non-teachers themselves) to enter data into federal forms and computer programs—but it also makes for opaque and uninformative data.

We dug and dug into state and district sources, too, and almost never could find what we sought by way of useful and revealing categories, totals, comparisons, trend-lines, and associated pricetags. How can education policymakers, executives, and budgeteers make informed staffing decisions if this enormous cadre of school employees are not even recorded in discrete sub-sets that can be tracked over time—along with their costs—and compared with similar H.R. categories and expenditures in other districts and states?

This dysfunction attests to the longstanding heedlessness of education leaders (and analysts) regarding the costs and benefits of non-teaching personnel.

Our sense is that these millions of people have quietly accumulated over the years as districts simply added employees in response to sundry needs, demands, and pressures—including state and federal mandates and funding streams—without carefully examining the decisions they were making or considering possible tradeoffs and alternatives. This was the path of least resistance and, at a time of rising budgets, was viable even if not prudent.

But it's no longer sustainable in the public sector any more than the private. Observe how private firms go about reducing costs, boosting productivity, enhancing organizational efficiency, and increasing profitability: they almost always start with staffing. The Pentagon is putting itself through similar self-scrutiny. So is the U.S. Postal Service.

One could list plenty more examples. No, changing staff—and staff-related budgets—is never easy, especially in the public sector, due to politics, contracts, and civil-service rules. But that's what leaders are for—to overcome obliviousness, work through politics, catalyze rethinking, and rearrange practices that no longer deliver the required results at an affordable cost.

Hence our recommendations for education leaders, based on the present analysis:

» Look at the practices of other districts, states, and countries to determine which ones might usefully be emulated or adapted in pursuit of better outcomes and efficiencies.

» Demand—and help gather—better data on the three million individuals who work for U.S. public schools but are not classroom teachers. Then scrutinize what they actually do to determine whether those functions are essential and, if so, whether there might be a better way of performing them.

» Be creative when structuring one's organization and deploying resources in response to obligations. Consider what can be done better (or less expensively) with the help of technology. Consider whether, for example, a behavioral specialist—or reading

specialist—might better meet the educational needs of some youngsters than a platoon of aides.

» Each time you think of hiring (or replacing) someone, evaluate the necessity—and cost benefit—of that role. How vital is a given position to the school's core mission? And is a full-time employee the best and most economical way to carry out a specific responsibility?

» Take maximum advantage of staffing flexibility already available within today's contractual, programmatic, and regulatory constraints and, where that's not sufficient to make needed tradeoffs and sound management decisions, push hard for additional leeway. When necessary, make a proper fuss at the state capitol or in Washington. Waivers can be gotten, statutes amended, exceptions made, alternatives approved.

Above all, make yourself and your team look under this hood. You are almost certain to be surprised by what you find there.

● ● ●

Executive Summary

From 1970 to 2010, the number of non-teaching staff in the United States (those employed by school systems but not serving as classroom teachers) grew by 130 percent. Today, non-teachers comprise a robust half of the public-school workforce (totaling roughly three million individuals), and their salaries and benefits absorb one-quarter of current education expenditures. But even as states and communities face inordinate budgetary stress, the increase in the numbers of non-teachers has attracted very little attention.

This report delves into several data sets to better understand how school staffing has changed over the last half-century. Our aim is not to determine whether these changes are "good" or "bad," but to document them so that decision makers begin asking better questions about these trends—and in so doing, also do better both by their students *and* their bottom line.

The study resulted in five key findings:

1. **Since 1950, school staffing has increased nearly 400 percent, and non-teaching personnel have played a major part in that growth.** The years between 1970 and 1980 were particularly notable, as teaching and non-teaching numbers increased dramatically relative to enrollment. Passage of several pieces of federal legislation—such as Section 504, the Education for All Handicapped Children Act, and Title IX (Equal Opportunity in Education Act)—likely played a big part in changing the makeup of schools.

2. **We spend far more on non-teaching staff (as a percentage of education spending) than do most of our economic peers in the OECD.** In fact, we spend more than double what Korea, Mexico, Finland, Portugal, Ireland, Luxembourg, Austria, and Spain do. Only one country spends more (Denmark).

3. **States are far from homogeneous in how their schools are staffed, but much of that variation is due to differences *within* their borders.** States with a large

proportion of their population living in cities tend to have less staff per student overall.

4. **Over the last forty years, the biggest driver of growth in non-teachers has been in the teacher-aide category.** From 1970 to 2010, aides went from nearly non-existent to the largest individual staff position, outside of teachers. (See Figure ES-1.) ("Other" staff also grew significantly, but it is an opaque collection of many positions.)

5. **School districts vary greatly relative to their number of employed personnel, but those differences likely stem from staffing decisions made by leaders.** While it is true that the location of a district (rural, town, city, etc.), the number of students receiving special-education services, and other demographic variables matter, they do not explain most of the variation across school districts.

FIGURE ES-1	Staff Percentages in U.S. Districts

3,360,763 Staff

7.4%	
30.9%	
1.7%	40.0%
60.0%	

1970

6,195,207 Staff

7.3%	
30.8%	
11.8%	50.0%
50.0%	

2010

Teachers   Teacher Aides

Support Staff   Other Staff
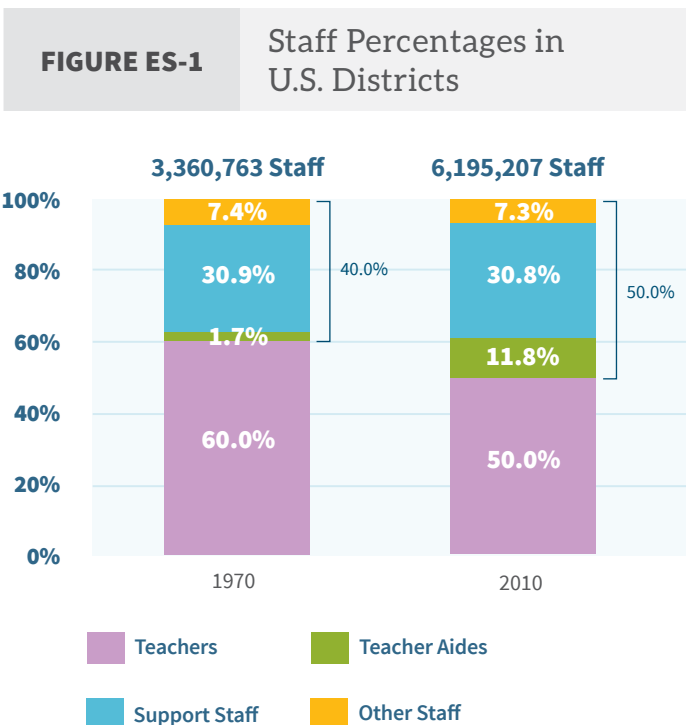
Based on these findings, and drawing on previous research, we recommend that school-district leaders take a hard look at their current staffing policies. Specifically, they should:

» **Know both the expanse and limits of the authority provided to them via state, district, and local policies.** Leaders often have more flexibility in staffing than they realize or care to embrace—especially if they are conflict averse. They should use the latitude they have to drive policy based on students' best interests.

» **Be creative when solving staffing needs.** Instead of hiring multiple teacher aides, for example, one behavioral specialist may be more effective in serving students with special needs. And certain blended-learning models can reduce lecture time and provide fine-grained tracking of student progress—while giving teachers extra time in their day to grade papers or plan lessons.

» **Evaluate the necessity—and cost benefit—of hiring additional staff members versus reorganizing existing ones or adopting other solutions.** If the cost is high and benefit low, funds would likely be more effective elsewhere. To make these comparisons, districts need to conduct robust staff and program evaluations (most do not).

Introduction

In the forty years after 1970, overall staffing in U.S. public schools ballooned from 3.4 million to 6.2 million individuals—an 84 percent increase.[1] That growth includes 1.1 million teachers and 1.8 million other school- and district-level staff. During the same period, the number of students grew by just 8.6 percent (from 45.6 to 49.5 million).[2] In other words, for every four children added to the system, we hired three adults. Over these four decades, the student-to-adult ratio shrank from 14:1 to 8:1.

Some of the growth in staffing took place because of an unrelenting push for more teachers. And that push has succeeded handsomely: the number of public-school teachers jumped 54 percent during this period, shrinking the average number of pupils per teacher from 22.6 to 16.0.

Yet there's another side to the staffing story. From 1970 to 2010, *non*-teaching staff (those employed by school systems but not serving as classroom teachers) grew by *130 percent*. Today, non-teachers comprise a robust half of the public-school workforce, totaling roughly three million individuals, and their salaries and benefits absorb one-quarter of current education expenditures.[3] But this growth, even at a time of budgetary stress across many states and communities, has barely attracted a passing glance.[4]

FIGURE 1 Growth in Education Staffing and Enrollment (1970–2010)
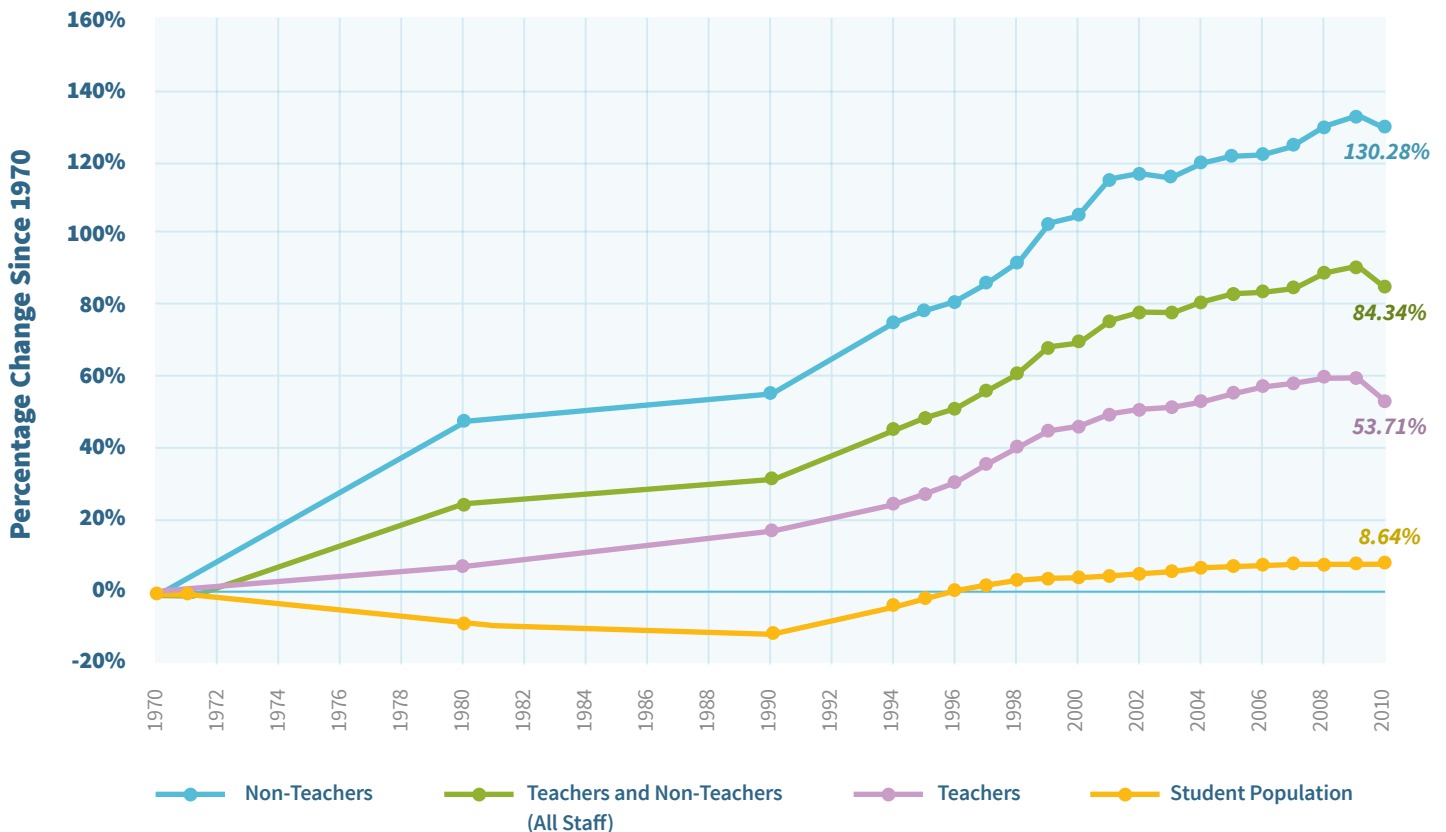
- **Non-Teachers**
- **Teachers and Non-Teachers (All Staff)**
- **Teachers**
- **Student Population**

Source: National Center for Education Statistics, Digest of Education Statistics, "Staff employed in public elementary and secondary school systems, by type of assignment: Selected years, 1949-50 through fall 2010," Tables 35, 37, and 92, 2012, http://nces.ed.gov/programs/digest/d12/tables/dt12_092.asp.

A 2012 report from the Friedman Foundation, the only other major analysis of non-teachers that we are aware of, found that, from 1950 to 2009, U.S. public schools increased their non-teaching positions by 702 percent (versus a 96 percent increase in students and a 252 percent increase in teachers).[5] Our data show that, over the same period, teaching positions dropped from 70 percent to 50 percent of all education jobs. From 1970 to 2010, instructional aides increased from less than 2 percent to nearly 12 percent of all staff.[6] Further, between fiscal years 1994 and 2010, non-teaching personnel increased proportionally at more than two-and-a-half times the rate of the pupil population (see Figure 1).

From 1970 to 2010, instructional aides increased from less than 2 percent to nearly 12 percent of all staff.

This striking set of trends may finally have come to a head, however, as the 2008 recession forced many districts to take a hard look at their staffing budgets. An annual survey published by the American Association of School Administrators (AASA) found that over two-thirds (68.2 percent) of districts eliminated staff in 2010–11, with similar figures for the following two school years (68.0 percent in 2011–12, 65.5 percent in 2012–13).[7] In any one district, the position most likely to experience cuts was that of teacher aides. Core subject teachers were next in line, with maintenance, cafeteria, transportation, secretarial, and library staff also vulnerable. It's unclear whether these reductions are a sensible result of right-sizing in a field that has grown continuously for over forty years, or a harmful slashing of mission-critical personnel.

The goal of this paper is to give these extraordinary developments more of the attention that they warrant, and to help provide some clarity to a topic that sorely needs it.

To be clear, we do not assume staff growth to be necessarily "bad." Over the last several decades, schools have been asked to take on a plethora of new responsibilities. A teacher is not equipped to be a social worker or speech pathologist, so new staff with specific skills were needed to achieve the school system's expanded mandate to serve well the proliferating needs of all children.

Yet today's heavy pressure to do more with less—plus policymakers' strong push for better learning outcomes—demands that we scrutinize every aspect of the school for economies, efficiencies, and potential improvements. Work is already underway on reimagining the classroom (e.g., Public Impact's "opportunity culture" initiative)[8] and the ways that teacher positions are structured—their roles augmented by new technologies and ways of thinking. We would be remiss if we did not also consider the use of non-teaching staff, both historically and with some thought toward the future.

PURPOSE

A small number of extant studies document the upward trend in non-teachers.[9] But they do not subdivide or sort "non-teaching personnel" into discrete roles to show precisely where increases (or declines) have occurred, nor do they disaggregate these data to the district level. They also come up short in developing empirically based explanations for such trends. Our goal is to plug some of those holes.

Toward that end, we begin by analyzing broad trends in U.S. non-teaching personnel over time, and then refine our focus to examine patterns within more specific personnel categories. We use national (1950–2010), state (1986–2010), and district-level data (1993–2010) from multiple (and, regrettably, sometimes non-comparable) sources to examine changes in non-teaching personnel over the last half-century. We also interviewed a handful of district leaders (CFOs, superintendents, and other district officials) to add context to the numbers. From these data, we explore five questions:

1. How has school staffing changed nationally since 1950? What is the place of non-teaching personnel in those changes?

2. What do non-teaching staff numbers look like, state-by-state?

3. What does non-teaching staff comprise and which categories have grown the most?

4. Are there significant district-level variations in staffing levels and trends?

5. What factors (such as urbanicity and special-education enrollments) are related to the number of non-teaching staff in a district?

The following analysis has four parts. In the first, we examine the national context from 1950 to 2010, analyzing broad staffing trends and then narrowing our focus to non-teachers (question 1). Second, we briefly investigate state-level variations and how those rates have changed since 1986 (question 2). Third, we dive into school districts, comparing data to identify variables that may influence broader trends (questions 3–5). We end with some thoughts on the nature of these changes, and where to go from here.

Readers should know in advance that the data cannot be directly compared across sections. The numbers we've been able to obtain for each level—national, state, and local—come from different (and not always consistent) sources. Instead, think of each section as presenting the experience of a single character in a larger plot. By reading them all, we gain a more robust picture of the whole story.

Methods

We drew national (1950–2010), state (1986–2010), and district (1993–2010) data from the National Center for Education Statistics, availing ourselves of both the Common Core of Data and the *Digest of Education Statistics*. All analyses use the full-time equivalent (FTE) metric for reporting staff numbers, unless otherwise noted.

For the national and state sections, we include all district- and school-level staff when calculating non-teaching personnel levels. The district analysis, however, examines only school-level personnel.

The Local Education Agency Universe Survey data, from which our district data set was derived, are incomplete. We dropped three states (Illinois, Montana, and New Jersey) and the District of Columbia because they were inconsistent in their reporting and/or were missing significant amounts of data. Unfortunately, we also had to omit charter schools for the same reason. Further, many charters operate as their own LEAs, even though they are, in fact, individual schools.

We supplemented the quantitative data with a small number of interviews with district leaders to provide context to the numbers. Interviewees hail from six districts that showed a clear pattern of either steady growth *or* decline in the number of non-teaching staff over the last twenty years (based on our district measurements).

For further explanation of methods and results, see Appendix A.

1 Changes in School Staffing Since 1950

In 1950, the United States staffed its public schools (and districts) with about 1.3 million people (Figure 2), including teachers, principals, librarians, janitors, superintendents, and everyone else falling under the district's personnel umbrella. Over the next sixty years, that number almost quintupled to 6.2 million (2010).[10] While some of that extraordinary increase can be attributed to rising pupil enrollments, the number of children in public schools only doubled during that period, from 25.1 million to 49.5 million.[11] Students per staff member dropped from 19.3 in 1950 to 8.0 in 2010.[12] And from 1970 to 1990, enrollment actually *decreased* by five million students, while staff numbers continued to grow.

It's indisputable that demands to reduce class sizes played a major part in this uneven growth. From 1950 to 2010, the ratio of students per teacher dropped from 27.5 to 16.0. Yet, as Figure 1 demonstrates (page 8), the number of teachers increased at a *slower* rate than did non-teachers. This supports the notion that non-teaching staff played a major role in the staff-to-student growth seen over that time period. What do these numbers look like when pulled apart?

THE ROLE OF NON-TEACHERS IN THE "STAFFING SURGE"

Figure 3 apportions school staff into seven categories: teachers, and six categories of non-teaching staff.

As noted, from 1950 to 2010, teaching positions increased dramatically. During the 1970s alone, nine teacher positions were added for every 1,000 students. Growth has since slowed: from 2000 to 2009, the rate was only three new teaching positions per 1,000 pupils.[13]

Among non-teaching personnel, instructional aides and support staff (including district administrative support, school and library support, student support staff,[14] and "other" staff) have been the largest instigators of personnel increases. Together, they grew 141 percent between 1970

and 2010 (from 1.1 million to 2.6 million individuals), representing 54 percent of all staff growth over the last forty years.[15] As with teachers, the number of aides and support positions increased most dramatically between 1970 and 1980, adding 17 adults in these roles per 1,000 students. In just that decade, teachers dropped from 60.0 percent of all staff to 52.4 percent (see Figure 4, page 14). Also notable: by 1980, support staff and instructional aides comprised 85.0 percent of non-teachers.[16]

Prior to 1970, the number of instructional aides was on par with, or smaller than, the aggregate number of school principals, librarians, and guidance counselors—staffing categories that have remained relatively constant over the last sixty years. (In 1970, there were 2.0 principals and assistant principals, 0.9 librarians, and 1.1 guidance counselors per 1,000 students; in 2010 there were 3.3 principals and assistant principals, 1.0 librarians, and 2.1 guidance counselors.) Aides comprised only 1.7 percent of staff in 1970, yet by 1980 had increased to over 7.8 percent of all positions. With continued growth in their numbers, by 2010 that proportion had reached nearly 12 percent (Figure 4).

In 1950, the United States staffed its public schools (and districts) with about 1.3 million people, including teachers, principals, librarians, janitors, superintendents, and everyone else falling under the district's personnel umbrella. Over the next sixty years, that number almost quintupled to 6.2 million (2010).

Support staff, on the other hand, have had a significant presence in schools for as far back as we have data (24 percent of all personnel in 1950, not shown). And while there are certainly more overall support positions today than in 1970 (nearly 900,000 more in 2010), that category's

FIGURE 2   Total Number of Students and Education Staff in U.S. School Districts, 1950–2010
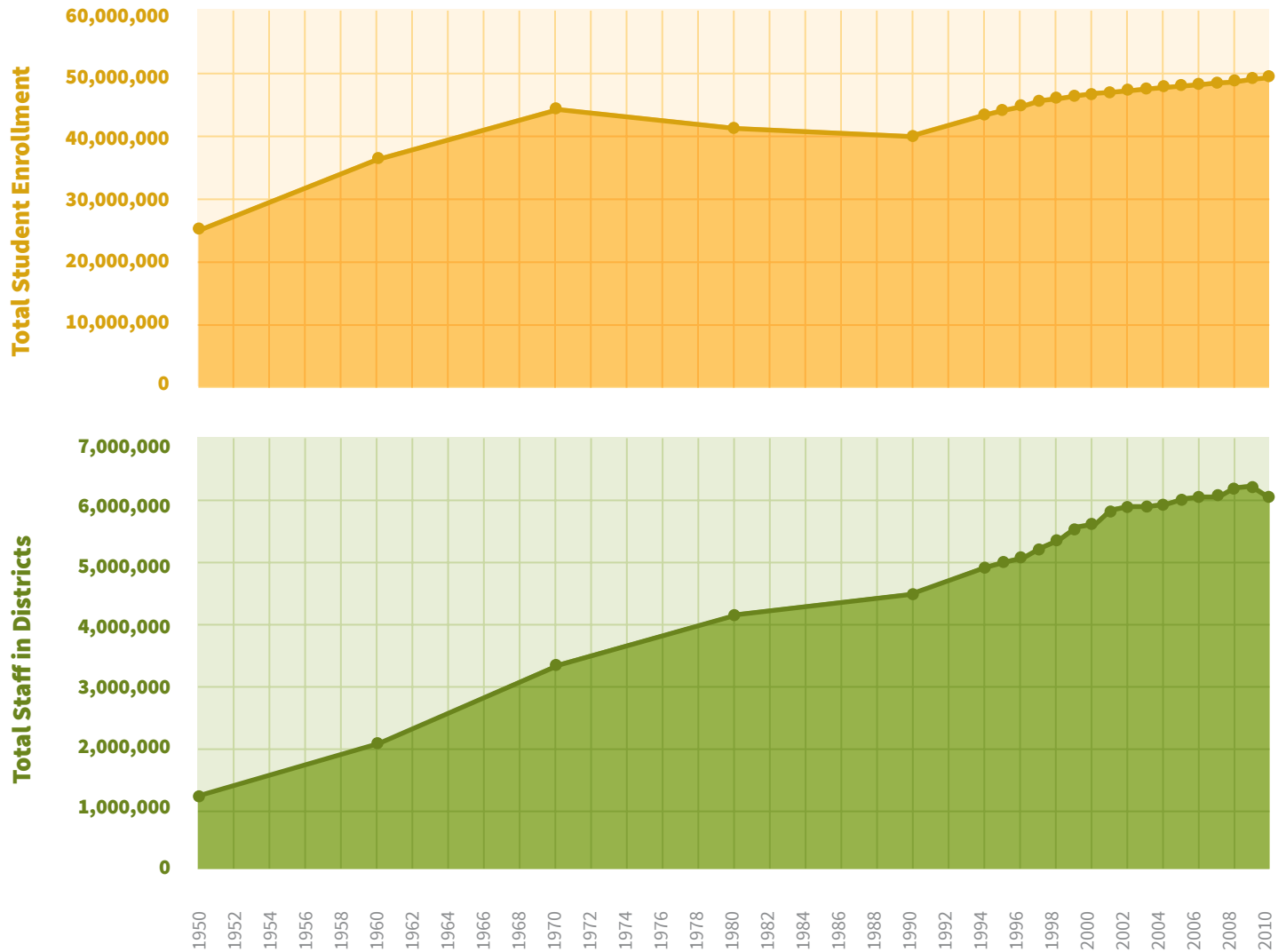
Data Source: National Center for Education Statistics, *Digest of Education Statistics*, Table 92, 2012, http://nces.ed.gov/programs/digest/d12/tables/dt12_092.asp.
Note: Because of revisions to the NCES classifications, figures for support staff and instructional aides are only roughly comparable before and after 1980.

share of total education personnel did not increase over those forty years. Percentage growth of support staff was average, relative to all personnel, and in contrast to teacher aides, whose number rose at over six times the overall average. The large number of staff positions in the support category is not surprising, given the wide variety of roles included there (custodians, secretaries, bus drivers, accountants, mechanics, etc.). Note also that current data sources do not allow us to disaggregate these national "support staff" numbers into their various roles and functions, making it difficult to draw meaningful conclusions. (At the state and local levels, in a few cases

we *are* able to disaggregate these data; see Florida and Arlington spotlights on pages 19 and 22).

What changed during these four decades? Along with shrinkage in the total pupil population between 1970 and 1985, this period is notable for the many education laws, reforms, programs, and mandates that emanated from Washington (and their counterparts in some states). Perhaps most important was the 1975 advent of federally mandated education for "handicapped" (as they were then known) children. Also arriving on the U.S. education scene during this period was newfound attention to female equality and support of non-English speakers. All of these

FIGURE 3   Average Number of Staff per 1,000 Students in U.S. School Districts, 1950–2010

Source: National Center for Education Statistics, *Digest of Education Statistics*, Tables 35, 37, and 92, 2012, http://nces.ed.gov/programs/digest/d12/tables/dt12_092.asp.
Note: Because of revisions to the NCES classifications, figures for support staff and instructional aides are only roughly comparable before and after 1980.
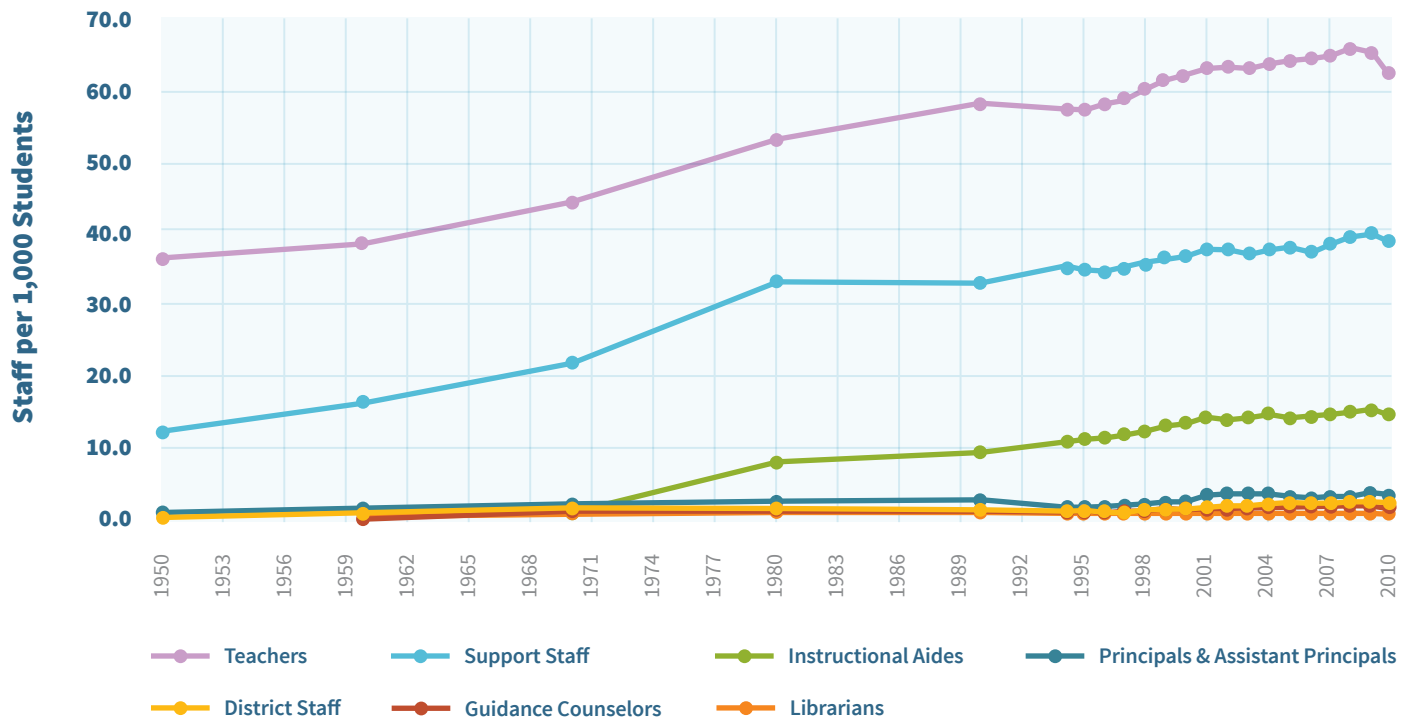
changes in school obligations and programs had inevitable implications for the size and makeup of school staffs (see *A Social Revolution*, page 16).

INTERNATIONAL CONTEXT

To put U.S. staffing numbers in context, Table 1 shows compensation and spending data for OECD countries (Organization for Economic Cooperation and Development) for 2010 (the latest year available). Though raw personnel numbers are unavailable, we use spending to compare the relative compensation of teachers and non-teachers in these education systems. We see that the United States spends slightly above the OECD average on total staff compensation: 81.5 percent of non-capital expenditures in K–12 education go for employee salary and benefits, versus an OECD average of 78.2 percent. Yet the United States spends well below the average on teachers, relative to total spending: 54.8 percent versus an OECD average of 62.0. (This does not mean that we are spending *less* than other countries, just that we

are spending less on teachers as a proportion of total education spending.) At the same time, the United States spends relatively more to compensate non-teachers. In fact, the United States spends proportionately more to pay non-teachers than any other country in the OECD save Denmark. Note that the United States spends more than *double* what Korea, Mexico, Finland, Portugal, Ireland, Luxembourg, Austria, and Spain spend on non-teaching staff—about 172 percent of the OECD average.

Why these disparities occur hinges on many factors, beginning with the demographic, cultural, and geopolitical differences among nations. In Iceland, for instance, the OECD reports that teachers have longer average work hours than in the United States (9.2 versus 7.7 hours a day, respectively) but only 3.5 hours of teaching within that day—compared to 6.1 hours in the United States. That leaves Icelandic teachers more than five hours a day to work on other tasks—almost as many non-teaching hours as an American teacher has in a week.[17] Similarly, the typical U.S. teacher spends nearly

1,100 hours a year teaching, while educators in Japan and Finland teach about 600 hours.[18] This may indicate that other nations do not require as many non-teaching staff as the United States because teachers are filling more of those kinds of roles (in addition to their primary classroom duties). Noteworthy, too, many OECD countries pay far less attention to organized athletics within their public-education systems, reducing the need to hire coaches and athletic support staff.[19]

International comparisons can almost never explain which staffing system is "best." But they can, and do, show that other nations accomplish things quite differently than we do. Which also signals that we don't necessarily have to do it the way we have grown accustomed to. Other countries, for instance, appear to give teachers more time in their day for non-instructional (or at least non-classroom) work. At any rate, our pattern of high spending on non-teaching staff is far from universal. Indeed, the United States looks like a distinct outlier!

We turn our attention next to how states differ in their approaches to non-teaching staff.

| FIGURE 4 | Staff Percentages in U.S. Districts |

Staff Percentages in U.S. Districts

- 1970: 3,360,763 Staff — Teachers 60.0%, Teacher Aides 1.7%, Support Staff 30.9%, Other Staff 7.4% (40.0%)
- 1980: 4,168,286 Staff — Teachers 52.4%, Teacher Aides 7.8%, Support Staff 32.6%, Other Staff 7.1% (47.6%)
- 2010: 6,195,207 Staff — Teachers 50.0%, Teacher Aides 11.8%, Support Staff 30.8%, Other Staff 7.3% (50.0%)

Legend: Teachers, Teacher Aides, Support Staff, Other Staff
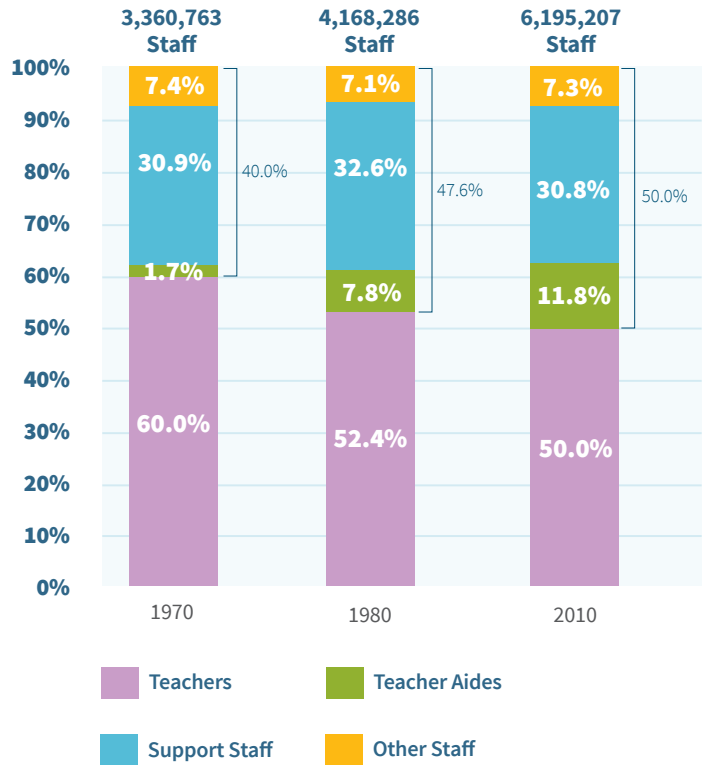
TABLE 1	**Total Education Spending (K-12) in OECD Countries, Non-capital Expenditures (2010)** **(Top three in each category are shaded green)**			
COUNTRY	**SPENDING AS % OF GDP**	**COMPENSATION OF TEACHERS** *(% of non-capital expenditures)*	**COMPENSATION OF OTHER STAFF** *(% of non-capital expenditures)*	**COMPENSATION OF ALL STAFF** *(% of non-capital expenditures)*
Norway	5.1	(m)	(m)	78.9
Iceland	4.9	(m)	(m)	78.5
Denmark	4.8	50.8	29.6	80.4
U.K.	4.8	37.7	23.0	60.7
Ireland	4.8	70.1	10.5	80.6
Belgium	4.4	71.4	17.2	88.6
Australia	4.3	60.2	16.1	76.3
Israel	4.3	(m)	(m)	82.8
Korea	4.2	57.7	12.7	70.4
Finland	4.1	52.8	11.4	64.2
Netherlands	4.1	(m)	(m)	82.2
France	4.1	57.7	22.7	80.4
Switzerland	4.0	70.2	14.1	84.3
United States	4.0	54.8	26.7	81.5
Mexico	4.0	83.1	10.3	93.3
Sweden	4.0	49.2	17.0	66.7
Slovenia	3.9	(m)	(m)	78.9
Portugal	3.9	82.7	10.4	93.1
Canada*	3.9	62.5	15.0	77.4
Poland	3.7	(m)	(m)	68.7
Austria	3.6	68.2	9.1	77.3
Luxembourg	3.5	75.8	9.2	84.9
Spain	3.3	73.3	9.1	82.5
Italy	3.2	63.1	18.7	81.9
Slovak Republic	3.1	50.9	13.7	64.6
Japan	3.0	(m)	(m)	86.4
Czech Republic	2.8	46.9	14.2	61.1
Hungary	2.8	(m)	(m)	74.6
Turkey	2.5	(m)	(m)	87.0
OECD average	**3.9**	**62.0**	**15.5**	**78.2**

*Data from 2009
(m) denotes missing data
Source: OECD, "Education at a Glance 2013: OECD Indicators," Indicator B6 (Tables B6.1 and B2.1), http://www.oecd.org/edu/educationataglance2013-indicatorsandannexes.htm.
Notes: Nations missing "Compensation of All Staff" omitted from the table.
Includes both public and private expenditures.

A Social Revolution

The 1970s transformed nearly all corners of social and public policy in the United States, most definitely including K–12 education. This was the decade of the Education for All Handicapped Children Act (now the Individuals with Disabilities Education Act, or IDEA), Section 504 (also assuring education access and services for youngsters with disabling conditions), Title IX (prohibiting sex-based discrimination), the Bilingual Education Act (i.e., Title VII, passed in 1968), and the Gifted and Talented Children's Education Act. Public schools were transformed along the way from places where *many* kids could bank on getting a reasonably solid education into institutions where *all* children were expected to receive a "free and appropriate public education." It was a dramatic shift in how schools operated, putting the onus on them to accommodate many more students and more varied pupil needs and circumstances. By and large, districts responded by hiring more instructional staff, including many aides who worked with small groups of special-needs youngsters—and sometimes one-on-one. The mounting strength of teacher unions during this period also played a part in staff growth.[20] Support staff rose at a similar clip, including administrative staff (more regulations, more paperwork), student support staff (psychologists, speech pathologists, nurses, and other specialists), and "other" staff (including sanitation, maintenance, and transportation staff).

By the end of the 1970s, schools no longer consisted solely of teachers, a principal, perhaps a counselor and librarian, and a couple of janitors and lunch ladies. They had evolved into more complex institutions employing more adults in more roles and specialties. Further, the 1970s-era legislation was accompanied by better-informed parents (and sometimes attorneys) insistent that their students' rights be met, even when serving those youngsters was staff-intensive. During roughly the same period, schools were further burdened with obligations to provide special programs and services for youngsters with drug issues, health challenges, sex-and-sometimes-pregnancy activity, homelessness, and a host of discipline and family challenges. Districts understandably reacted by hiring more staff. In some communities, lack of skilled leadership led to new hires with no clear benefit to students. In other places, staffing decisions were made more thoughtfully, balancing district needs, resources, and available options.

While the optimal level of growth is up for debate—a debate we're eager to stoke—the sheer volume of extra requirements placed on schools no doubt required some degree of expansion in personnel numbers.

2 State Variations

In the U.S. K–12 education system, states matter enormously—and they differ from one another in myriad ways. That includes staffing. The map that follows (Figure 5) sorts them into four quartiles, with those shown in yellow having the fewest non-teaching staff per 1,000 students, and those in blue having the most (in 2010). Two notable points emerge:

1. The bottom-quartile states average fewer than fifty-nine non-teaching personnel for every 1,000 students, while states in the top quartile average more than seventy-seven.

2. Big states with large urban populations tend to have lower staff-to-student ratios (for example, California, Texas, Florida, and Illinois), while states with small urban populations trend toward higher ratios (New Hampshire, Maine, the Dakotas, and Arkansas).[21]

Low non-teacher ratios are most evident in the West and higher ratios in the Midwest. One possible interpretation: states with large urban populations tend to have lower staff-to-student ratios (Figure 5, yellow), while states with small urban populations trend toward higher ratios (blue). Most state populations west of Colorado are concentrated in urban areas (excluding Idaho), which could explain why all of those states are yellow or light green.[22] (Fully 95.0 percent of California's population lives in urban areas, for example, compared to Maine's 38.7 percent.) In fact, the ten U.S. states that are most urbanized average 48.8 staff per 1,000 students, while the ten states that are *least* urbanized average 78.2 staff per 1,000 students. This relationship likely springs from a number of related characteristics, including population density, school size, availability of talent, etc.

VARIATION OVER TIME

In 2010, the states averaged about sixty-seven non-teachers per 1,000 students. The numbers ranged, however, from more than one hundred (Wyoming, Vermont, and Virginia) to fewer than thirty (Nevada and South Carolina).

But the picture isn't static. Figure 6 shows change in non-teaching staff from 1986 to 2010 for all fifty states and the District of Columbia. Note, for example, that Maine and Ohio started with just forty-four and forty-seven non-teachers per 1000 pupils (not shown), but by 2010 had some of the highest ratios (ninety-one and seventy-five, respectively). Maine increased by forty-seven non-teachers per 1,000 students, more than the *entire* ratio in Idaho (forty-four), Arizona (forty-three), California (forty-three), Illinois (forty), South Carolina (twenty-eight), and Nevada (twenty-six) in 2010. Over the same twenty-four-year period, just five states decreased their staff-to-student ratios, with South Carolina dropping the farthest (from forty-three to twenty-eight, see Appendix, Table A-1). On the other hand, eighteen states increased their non-teaching personnel by *at least* twenty staff per 1,000 students, with Vermont increasing the most, from forty-nine to 104.

These numbers, it is worth reiterating, are from 1986 to 2010. Student enrollment began to level off in the mid-1980s and began growing again, after fifteen years of shrinking rolls. Major legislation (such as IDEA) had also been on the books for about a decade before this period began. Neither enrollment declines nor the initial shock of increased federal regulation can readily explain staff-to-student ratio growth during these years. States faced different enrollment trends, of course, but only ten states (including the District of Columbia) lost pupils from 1986 to 2010, and six of those had growth rates *below* the U.S. average.[23]

FIGURE 5   Non-Teaching Staff per 1,000 Students, by State (2010)

Non-Teachers per 1,000 Students

- Less than 59
- 59 to 66.9
- 67.0 to 77
- More than 77
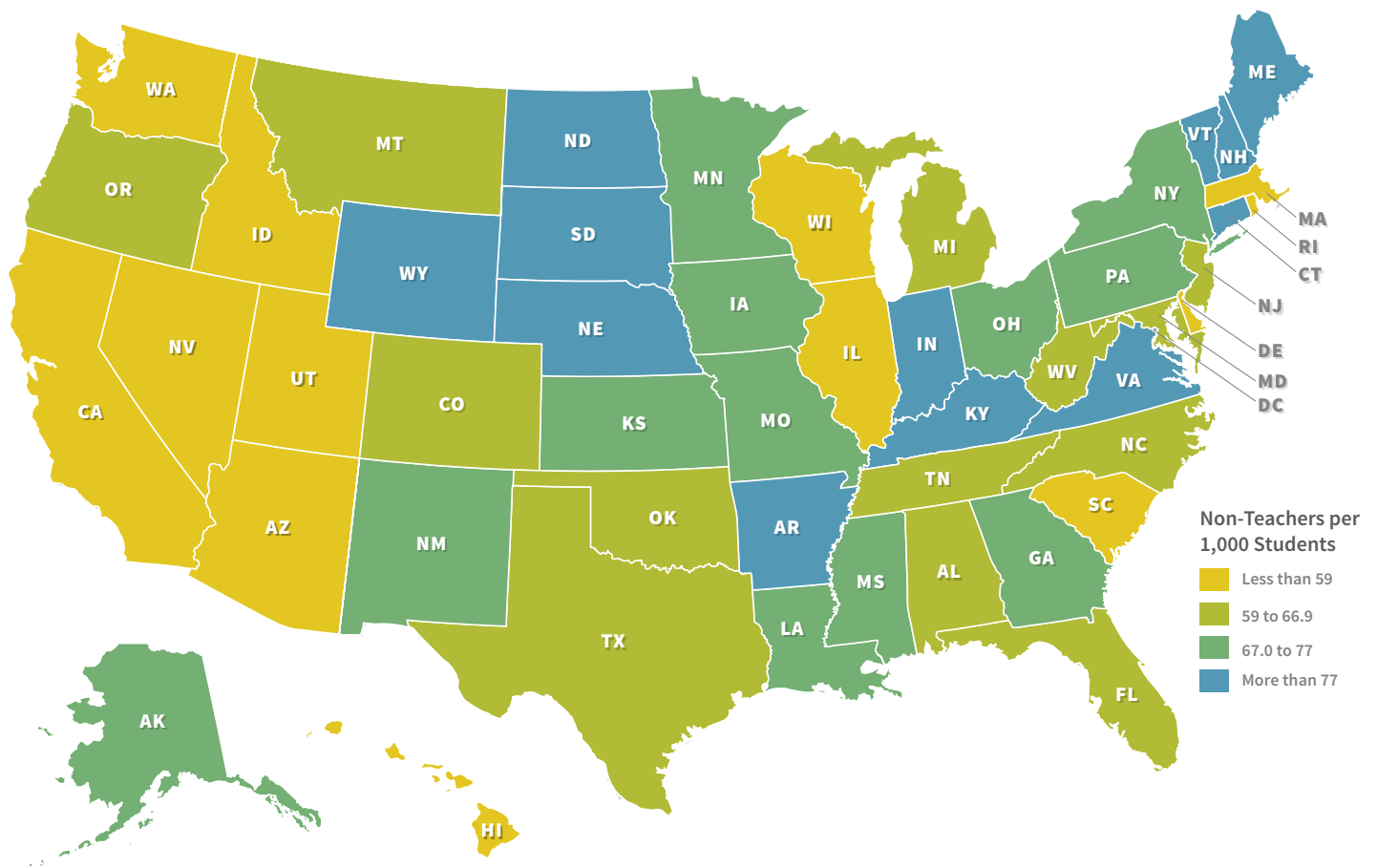
STATE	RATIO	STATE	RATIO	STATE	RATIO	STATE	RATIO
Nevada	26	Florida	60	Missouri	67	Indiana	77
South Carolina	28	Alabama	61	Minnesota	67	Nebraska	78
Illinois	40	Oklahoma	62	Georgia	68	Arkansas	79
California	43	Oregon	62	Kansas	68	South Dakota	80
Arizona	43	Tennessee	62	Iowa	71	North Dakota	81
Idaho	44	Colorado	63	New Mexico	71	Kentucky	85
Utah	46	Montana	63	Mississippi	73	Connecticut	89
Washington	48	North Carolina	64	New York	74	New Hampshire	90
Rhode Island	52	New Jersey	66	Louisiana	75	Maine	91
Wisconsin	53	Michigan	66	Alaska	75	Virginia	104
Massachusetts	56	Maryland	67	Ohio	75	Vermont	104
Hawaii	57	West Virginia	67	Pennsylvania	76	Wyoming	104
Delaware	58	Texas	67	Washington, D.C.	77	**State Average**	**67**

Source: NCES, "State Nonfiscal Public Elementary/Secondary Education Survey Data (2010-11)," http://nces.ed.gov/ccd/stnfis.asp.

| FIGURE 6 | Change in Non-Teaching Staff per 1,000 Students, 1986–2010 |
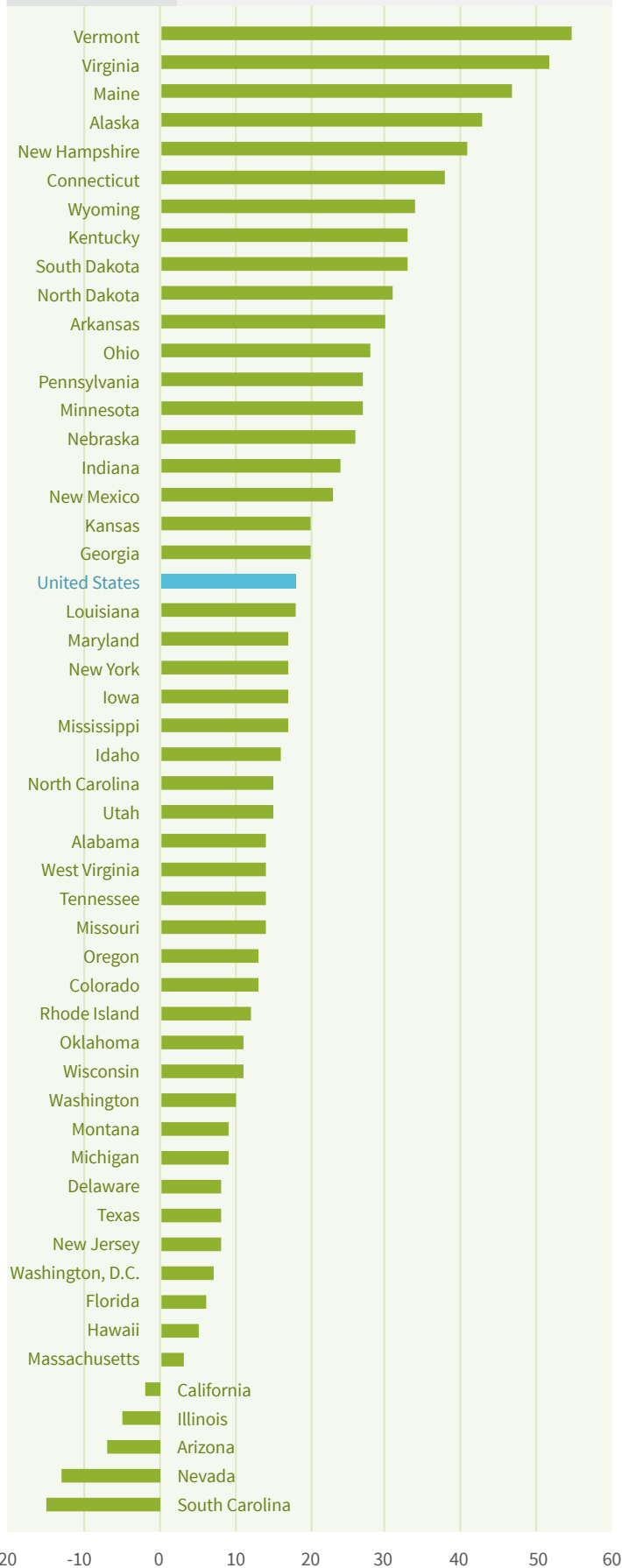
SPOTLIGHT: FLORIDA

Florida is one of the few states that codes detailed staffing data. While not directly comparable to other data sets or generalizable to other jurisdictions, it provides a useful glimpse into staffing in one large state.

Table 2 shows a breakdown of selected school-staff positions across Florida for 2010–11.[24] Teachers occupy the largest share by far (70.3 per 1,000 students); teacher aides are second (9.8), followed by custodians (6.4), bus drivers (5.1), and food service workers (4.8). Ranking positions by cost leads to a similar line order, with teachers taking home nearly 75 percent of reported salary expenditures.

Green rows represent staff positions that Florida tracks uniquely, but federal data typically merge into more generic aggregations, notably as "other" staff (at the district level). We see, for instance, that for every three teacher aides (row 2) there are two custodians (row 3)—and the average custodian actually makes more than the average teacher aide, by over 35 percent. Of the five largest categories, three (rows 3–5) are a part of "other" staff. Added together, non-teaching staff as a whole comprises forty-two personnel per 1,000 students. Of those, eighteen are "other" staff (43 percent).

Without data over time, it's impossible to say whether these positions have played a significant role in staff growth over the past few decades. But as we discuss "other" staff throughout this paper, it is helpful to have a benchmark—rough though it is.

How to Read the figure to the left: States are arranged from top to bottom based on the number of non-teaching staff that they added (or lost) per 1,000 students, from 1986 to 2010. The blue bar is the U.S. average, at eighteen. South Carolina is at the bottom, because it lost nearly fifteen staff per 1,000 students between 1986 and 2010 (the largest drop for any state). Moving up, California's "bar" is significantly smaller because its ratio was the most similar at the beginning and end of the time period (a change of roughly two). Vermont, at the very top, had the largest increase since 1986 (nearly fifty-five new non-teaching personnel per 1,000 students).

Source: NCES, "State Nonfiscal Public Elementary/Secondary Education Survey Data (2010–11)," http://nces.ed.gov/ccd/stnfis.asp

TABLE 2	Breakdown of Selected Positions in Florida K–12 Schools, 2010–11					
ROW	**POSITION**	**AVERAGE # OF STAFF PER 1,000 STUDENTS**	**TOTAL STAFF**	**AVERAGE SALARY ($)**	**TOTAL COST ($)**	**% OF REPORTED SALARY EXPENDITURES**
1	Teacher	70.27	185,271	45,732	8,472,813,372	72.98%
2	Teacher Aide	9.75	25,703	17,216	442,502,848	3.81%
3	Custodian	6.39	16,837	23,606	397,454,222	3.42%
4	Bus Driver	5.14	13,564	17,643	239,309,652	2.06%
5	Food Service	4.80	12,652	15,380	194,587,760	1.68%
6	Clerk/Clerk Typist	2.76	7,272	23,305	169,473,960	1.46%
7	Secretary	2.76	7,269	31,720	230,572,680	1.99%
8	Guidance	2.19	5,770	50,434	291,004,180	2.51%
9	Assistant Principal	1.62	4,270	65,520	279,770,400	2.41%
10	Principal	1.20	3,172	87,233	276,703,076	2.38%
11	Librarian	0.99	2,600	51,212	133,151,200	1.15%
12	Data Entry Operator	0.91	2,399	28,387	68,100,413	0.59%
13	Bookkeeper	0.84	2,215	30,251	67,005,965	0.58%
14	Mechanic	0.65	1,703	38,974	66,372,722	0.57%
15	School Psychologist	0.53	1,408	56,859	80,057,472	0.69%
16	Nurse (LPN/RN)	0.40	1,044	31,598	32,988,312	0.28%
17	Electrician	0.28	733	50,071	36,702,043	0.32%
18	Air Conditioning Tech & Boiler Mechanic	0.27	716	43,917	31,444,572	0.27%
19	Computer Systems Analyst	0.20	515	61,858	31,856,870	0.27%
20	Carpenter	0.19	509	43,232	22,005,088	0.19%
21	Dean	0.09	249	53,710	13,373,790	0.12%
22	Accountant	0.09	248	50,353	12,487,544	0.11%
23	Special School Director	0.05	141	89,909	12,677,169	0.11%
24	Computer Programmer	0.03	90	48,343	4,350,870	0.04%
25	Curriculum Coordinator	0.02	54	63,644	3,436,776	0.03%
	"Other" Staff[2]	**18**	**47,319**	**38,114**	**1,024,083,799**	**8.82%**
	Non-Teaching Staff[3]	**42**	**111,133**	**44,766**	**3,137,389,584**	**27.02%**
	Total	**112**	**296,404**	**$44,804**	**11,610,202,956**	**100%**

Data Source: Florida Department of Education, http://www.fldoe.org/eias/eiaspubs/default.asp.

[1] Staff numbers are head counts for all full-time employees.

[2] Green cells represent "other" staff in the NCES database.

[3] All staff except teachers.

3 Non-Teaching Personnel at the District Level

Analyzing state (and national) staffing patterns masks more nuanced and interesting variations at the local level. Indeed, the district is the locus of most staffing determinations and hiring decisions. Further, the vast majority of states are not homogeneous but rather a mix of large and small districts, urban and rural, rich and poor—each with its own norms, priorities, resource levels, traditions, and policy preferences. In fact, much of the variation *between* states is likely due to the balance of these factors *within* states: between 1993 and 2010, the average standard deviation (SD) for non-teaching staff ratios in same-state districts was two to four times as large as that among states.[25]

In this section, we examine these district-level variations. We use districts as the units of analysis, awarding each equal weight (rather than allowing large districts to skew the results). We then compare personnel numbers against selected district characteristics, including the percentage of children receiving special-education services.

Figure 7 presents staffing changes from 1993 to 2010 for all school-level personnel, averaged across all the districts in our data set. Brief summaries for each position follow. (For full position descriptions, see Appendix B.)

» **Teacher Aides –** Staff members assigned to assist a teacher with routine activities associated with instruction.

» **School Administration –** School administrators (principals and assistant principals) and administrative staff.

» **Student Support Staff –** Staff that "nurture" students but do not provide or directly support instruction (psychologists, speech pathologists, etc.).

» **Guidance Staff –** Guidance counselors.

» **Library Staff –** Librarians and library support staff.

» **Instructional Coordinators –** Staff that supervise instructional programs (curriculum coordinators, home economics supervisors, etc.).

» **"Other" Staff –** Staff not included in another category (custodians, food service staff, etc.).

If we add the seven personnel categories together, districts had fifty-seven non-teachers per 1,000 students in 1993; by 2010 that number had grown to sixty-nine. Teacher aides were the largest driver of this rise, increasing by 5.8 per 1,000 students. Library staff was the only category that didn't increase over the fifteen-year period. "Other" staff, school administration, and student support personnel all grew by about two positions per 1,000 students, while guidance and instructional coordinators increased by less than one position. Teachers also increased, from 68.6 to 74.4 per 1,000 pupils.

Calculated this way, aides accounted for more than half of the total increase in non-teaching staff, much as we saw earlier with the national data. Both analyses point toward aides as a major component of personnel growth, especially in the decades following 1970.

Still, the largest category overall is "other" staff. Accounting for 41 percent of all non-teaching staff in 2010, it is the catch-all for those personnel that do not fit into one of the other categories (i.e., custodians, bus drivers, etc.).[26] Our spotlights of Florida (page 19) and Arlington Public Schools (next page) indicate that custodians, transportation, and food service staff are the three largest categories in this "other" staff bucket, at least in the years and places that were examined. Yet, much like "support staff" in our national-level analysis, our inability to disaggregate "other" staff over time limits further examination of its effect on growth.

One may notice that teacher numbers are significantly higher in Figure 7 than in Figure 3. The reason is simple, and one we explore below: rural districts have more staff per

FIGURE 7   Average Number of Staff per 1,000 Students (Unweighted), 1993–2010
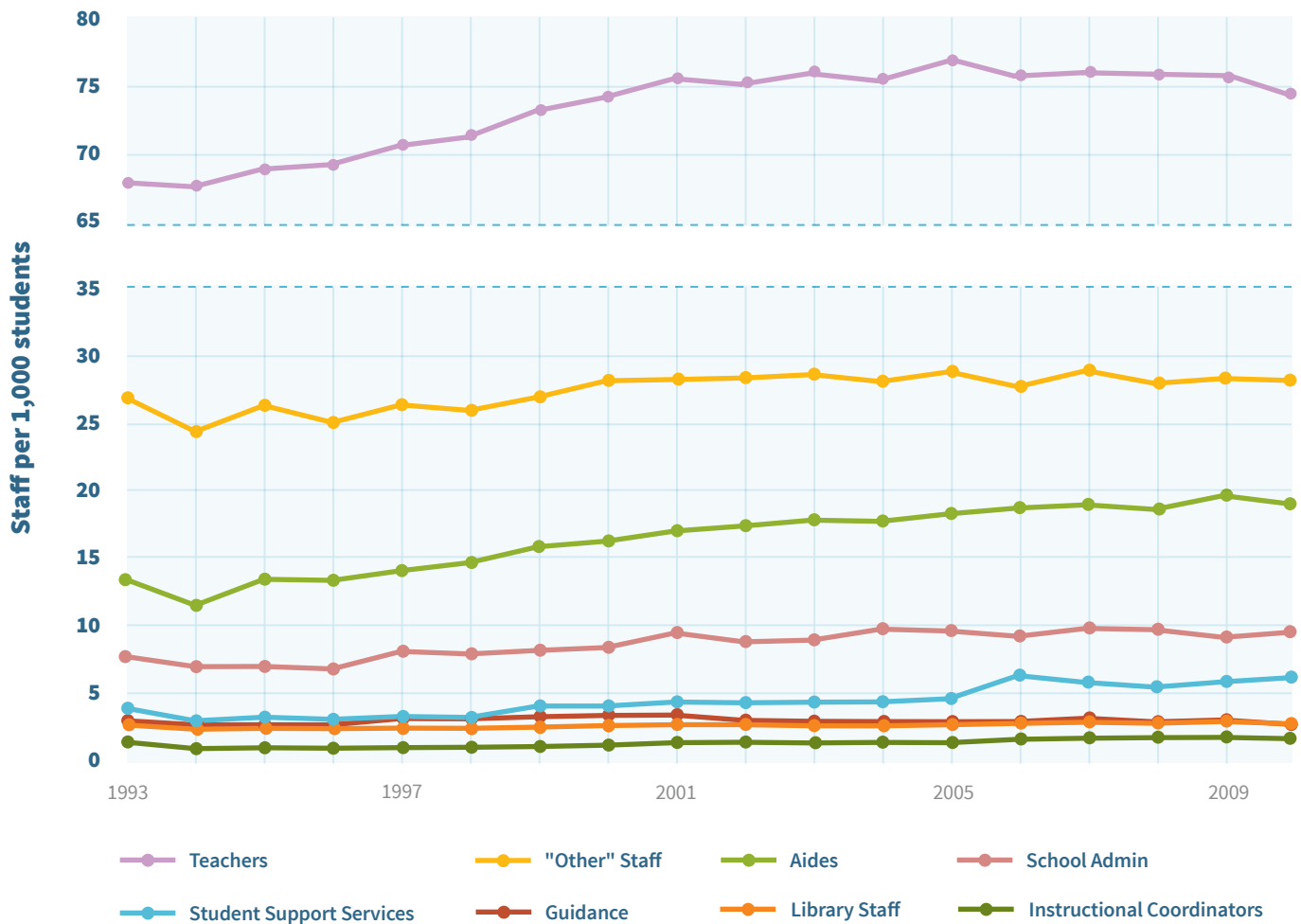
How to Read this Figure: Each line represents the average number of personnel in that category, per 1,000 students, for every year from 1993 through 2010. For example, in 1993, there were approximately seven administrative staff per 1,000 students in each district. By 2010, that number had risen to just over nine administrative staff per 1,000 students. (Note the break between thirty-five and sixty-five.)

Source: NCES, "Local Education Agency (School District) Universe Survey Data," Years 1993–2010, http://nces.ed.gov/ccd/pubagency.asp.

student than do urban locales, and that includes teachers. National data are skewed by large districts, which pull down the average. If we were to aggregate the district data in the same way, the results would be quite similar to those presented in Figure 3.[27]

SPOTLIGHT: ARLINGTON PUBLIC SCHOOLS

To gain a more nuanced understanding of the aggregate "other" staff category at the district level, we examined staffing allocations in one public school system: Arlington Public Schools (APS) in northern Virginia, just outside the nation's capital. In 2013, that district served 22,613 students in thirty-two schools, with 31 percent of students

receiving free and reduced-priced lunch (the Virginia statewide average that year was 40 percent).[28] Data are collected from the APS 2013 budget, so they cannot be directly compared to other districts.

As everywhere, teachers comprise the largest staffing category in Arlington, while teacher aides are the second largest (by a considerable margin), followed by custodians, front office staff, and transportation staff (Table 3). For every 1,000 students, Arlington employs about eighty-four teachers, twenty aides, and ten custodians. Counselors and other staff groups are relatively small in comparison.

TABLE 3	Staff in Arlington Public Schools (2013)	
POSITIONS	**TOTAL NUMBER OF STAFF**	**NUMBER OF STAFF PER 1,000 STUDENTS**
All Teachers	**1,801**	**83.5**
ESOL/HILT teachers	125	5.8
SPED teachers	284	13.1
All other and/or uncategorized teachers	1,393	64.6
All Teacher Aides[1]	**429**	**19.9**
ESOL/HILT aides (elementary only)	69	3.2
SPED aides (elementary only)	122	5.7
All other and/or uncategorized aides	238	11.0
Custodians	**222**	**10.3**
Front Office Staff (excluding principals)	**183**	**8.5**
Transportation	**168**	**7.8**
Drivers	128	5.9
Attendants	40	1.9
Cafeteria Workers	**120**	**5.6**
Counselors	**82**	**3.8**
SPED Specialists (speech, vision, etc.)	**81**	**3.8**
Principals + Assistant Principles	**76**	**3.5**
Maintenance	**60**	**2.8**
Library Staff	**54**	**2.5**
General Specialists (psychologists, etc.)	**34**	**1.6**
Instructional Technology	**27**	**1.3**
Total Non-Teaching Staff	**1535**	**71.1**

[1] ESOL/HILT= "English for speakers of other languages/high intensity language training." SPED= "special education." High schools do not report ELL and SPED teacher aides separately.

How to Read this Table: Indented positions fall under their larger category above. For instance, under Transportation, there are 168 transportation staff in total, comprised of 128 drivers and forty attendants. There are 5.9 drivers per 1,000 students in the district and 1.9 attendants, for a total of 7.8 transportation staff per 1,000 students.
Notes: Data on spending per position are not available.
Green cells represent "other" staff in the NCES database, categories that are otherwise indistinguishable from one another in national-level data.
Source: Arlington Public Schools, "Superintendent's Adopted Budget, Fiscal Year 2013."

Arlington data also provide the number of staff who teach non-native speakers (ESOL) and students with special needs (SPED). Figures for teacher aides are deceptively small for those categories, however, because Arlington does not subdivide teacher-aide positions at the secondary school level. The 69 ESOL and 122 SPED aides are all employed at the elementary level, where they account for well over 50 percent of the total. These numbers support what we heard in interviews: district leaders believe that the growth in teacher aide numbers is due to an increase in students with special needs. Of those aides serving at the elementary level, 30.8 percent are used for SPED services—a not insignificant proportion.

FIGURE 8   Non-Teaching Personnel per 1,000 Students, 1993–2010
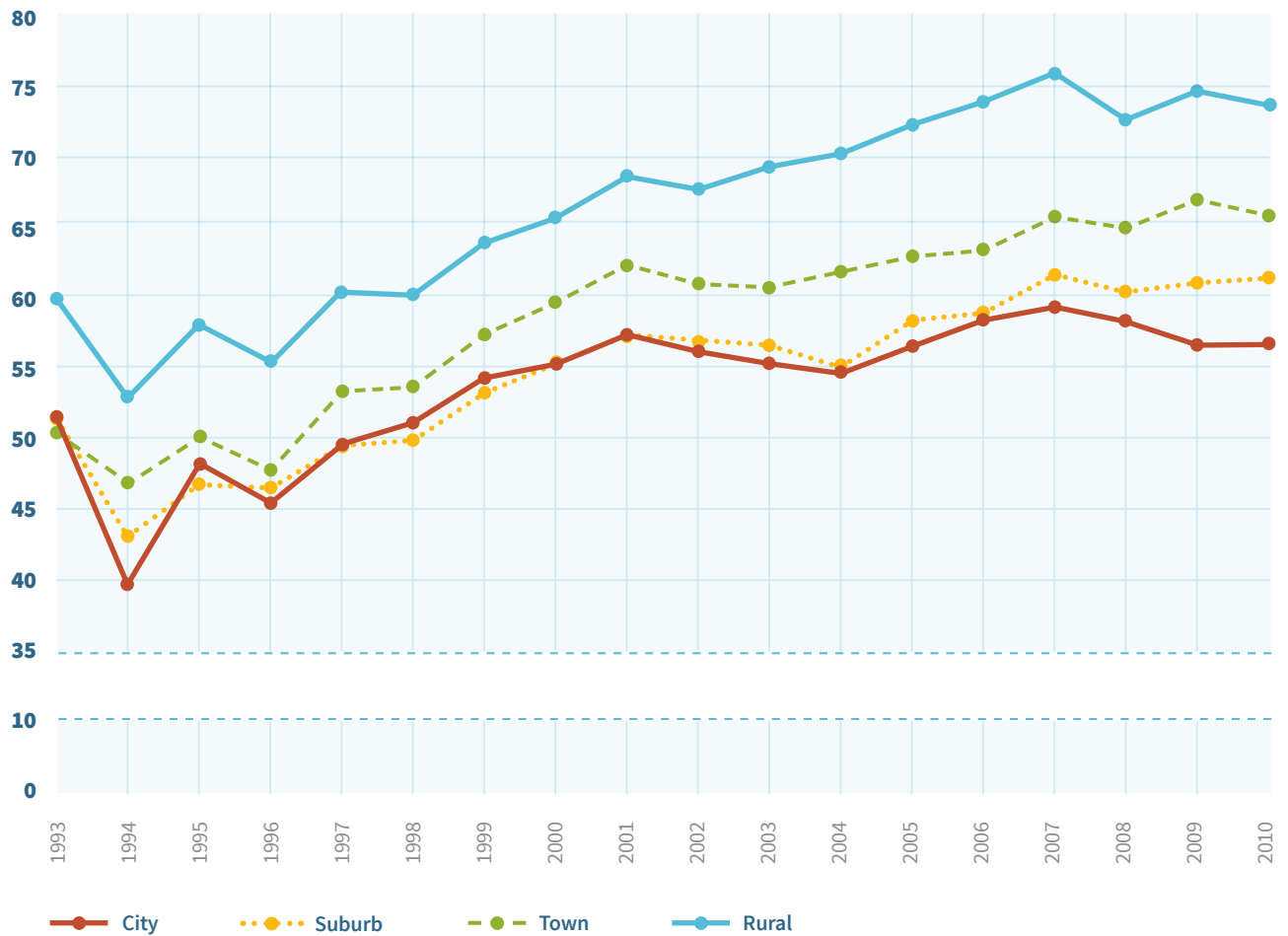
How to Read this Figure: In 1993, there were approximately sixty non-teachers for every 1,000 students in an average rural district. That same year, there were about fifty non-teachers in towns, and fifty-two in suburbs and city districts. By 2010, there were approximately seventy-four non-teachers in the average rural district (per 1,000 students), sixty-six in the average town district, sixty-one in the average suburban district, and fifty-seven in the average city district.

Note: Figures for non-teaching personnel are calculated by summing the average number of staff for each personnel category (aides, instructional coordinators, librarians, guidance counselors, school administration, student support, and "other" staff). (See Appendix A for more.)

Source: NCES, "Local Education Agency (School District) Universe Survey Data," Years 1993–2010, http://nces.ed.gov/ccd/pubagency.asp.

TABLE 4   Non-Teaching Personnel per 1,000 Students, by Urbanicity

Year	TEACHER AIDES				"OTHER" STAFF				NON-TEACHING (AGGREGATE)			
	City	Suburb	Town	Rural	City	Suburb	Town	Rural	City	Suburb	Town	Rural
1993	12.4	10.6	11.8	12.4	24.0	23.9	23.7	30.1	51.7	51.6	50.4	59.6
2010	14.5	18.2	19.0	20.0	22.2	23.6	26.3	31.7	56.6	61.3	65.9	73.8
Δ	*2.1*	*7.6*	*7.2*	*7.6*	*-1.8*	*-.3*	*2.6*	*1.6*	*4.9*	*9.7*	*15.5*	*14.1*

WHAT DISTRICT CHARACTERISTICS MIGHT BE RELATED TO NON-TEACHER STAFFING?

Next, we examine two district characteristics by which the number of non-teaching staff varies: urbanicity and student demographics. Urbanicity refers to how close a district is to a city and its surrounding urban area. Suburbs, for instance, are outside city lines but within its urban area. (Towns are outside, completely.) There are a number of important variables correlated with being in or near an urban area: district size, population density, public transportation, resource sharing, availability of talent, and so on. Any relationship with staffing is likely influenced by all of these variables but, to avoid conflation—and for the sake of consistency—we focus our analysis on urbanicity.[29] We find that city districts have lower numbers of non-teaching personnel relative to their student enrollments, while rural areas have significantly higher ratios. Towns (more rural) are in the middle, while suburbs (more urban) are fairly similar to cities. These results mirror our state-level findings.

Figure 8 illustrates this pattern. It shows the number of non-teaching personnel per 1,000 students from 1993 to 2010, by urbanicity. Rural districts stand out: in those seventeen years, their staff-to-student ratios were much higher, especially compared to suburban and city districts. In 2010, rural districts averaged seventy-four non-teaching personnel per 1,000 students while cities averaged only fifty-seven.

Not all personnel categories follow this urban-rural pattern. Of the four largest personnel categories (constituting 91 percent of non-teachers), only teacher aides and "other" staff are clearly related to urbanicity. Student support services and school administration (the third- and fourth-largest staff categories) do not have strong regional patterns.[30]

In 1993, rural districts employed far more "other" staff than other districts (see green columns, Table 4). By 2010 that gap had widened, partly because city and suburban districts decreased the number of "other" staff they employed, relative to students (from 24.0 and 23.9 to 22.2 and 23.6 per 1,000 students, respectively). Teacher aide numbers did not follow the same pattern, however: in 1993, city and rural districts had the same ratio of aides to students. But by 2010, cities had far fewer aides than suburban areas or towns, and rural districts had the most.

How close a district is to an urban center is clearly related to non-teaching staff-to-student ratios. In general, the more rural the district, the more staff per student a district employs. Rural areas have grown their staff ratios significantly since 1993, increasing the gap between rural and urban districts. "Other" staff and teacher aides are the largest contributors to this discrepancy each year, but teacher aides alone are the major factor driving the gap's growth, over time.

MAPPING A CLOSER LOOK

Is this pattern the result of state policy, with rural states enacting policies that increase staffing levels while more urban states adopt policies that decrease them? Or is state variation driven by choices made at the district level? If it were the former, we'd expect little variation within a single state. However, Figure 9 shows that, at least in Texas and Florida, there is clear heterogeneity among districts.[31] Both states are mapped at the district level, with darker shading representing a larger number of aides per 1,000 students. The accompanying Table 5 presents data for the five largest

The Urban Advantage

During our interviews, district leaders told us that one way they've saved money is by reducing or eliminating bus services. Indeed, transportation staff comprised a significant portion of non-teachers in both our Florida and Arlington case studies, signaling a high potential for efficiency gains. Rural districts are obviously limited in their ability to consolidate transportation services, for the same reason that multi-district resource sharing is more difficult. Rural districts may also encounter greater challenges in recruiting specialized staff, which may result in the hiring of uncertified staff (aides) to fill various gaps.[32] Densely populated districts generally have larger schools, can more easily share staff across schools (and with other districts), and can contract certain non-instructional services from private providers. Metro areas typically have richer talent pools with more skills on which to draw and from which to hire.[33] These combined advantages may explain much of the link between a district's location and its ratio of non-teaching staff to pupils.

FIGURE 9   Map of Teacher Aide Ratios, Texas and Florida (2010)

Number of Teacher Aides per 1,000 Students

- Less than 10
- 10 to 15
- 15 to 20
- 20 to 25
- More than 25
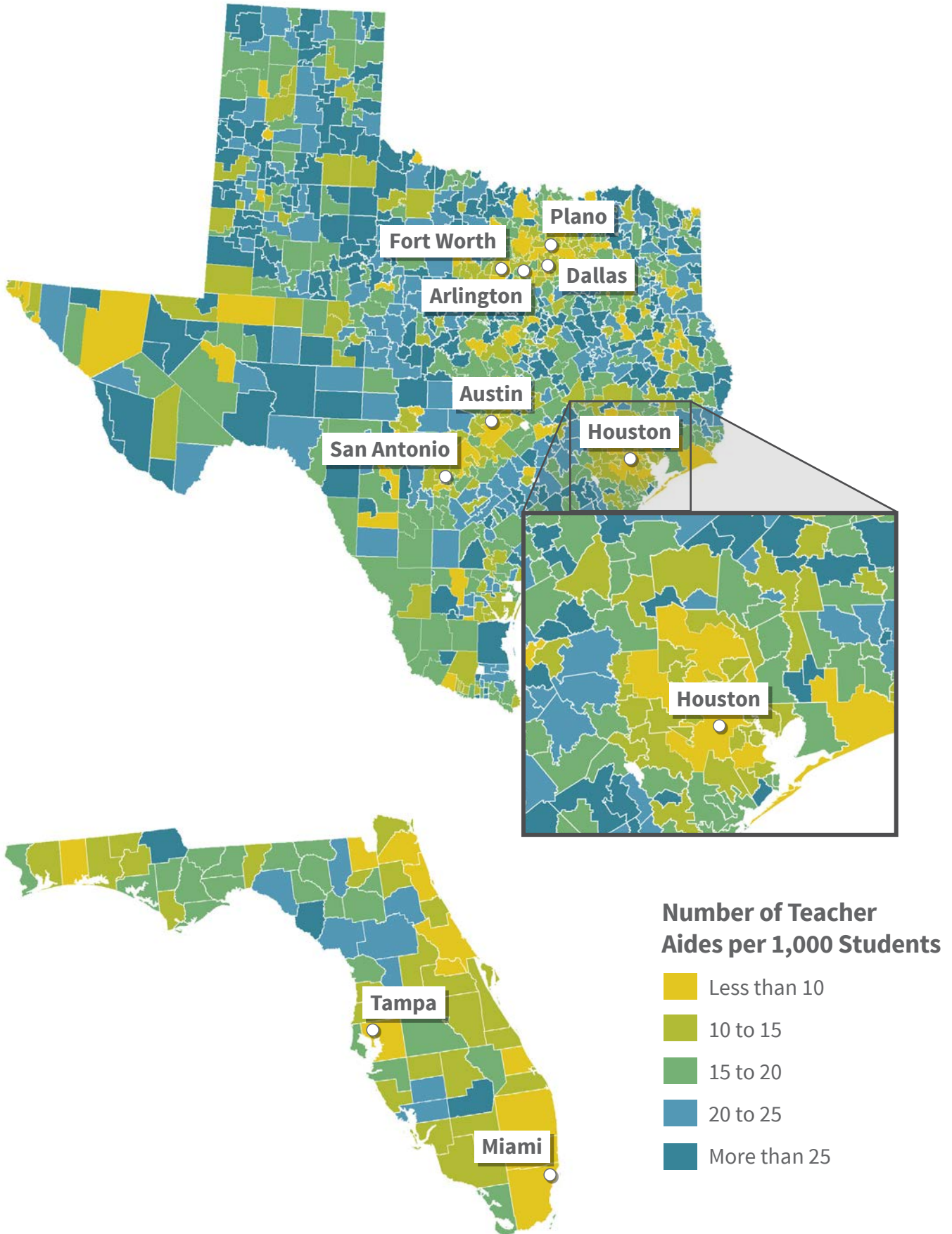
TABLE 5	Teacher-Aide Ratios in Select Counties (Texas and Florida), 2010					
	FLORIDA			**TEXAS**		
	County/District	**Population**	**Teacher-Aide Ratio** *(Aides per 1,000 Students)*	**County**[1]	**Population**	**Teacher-Aide Ratio** *(Aides per 1,000 Students)*
Five Largest Counties	Miami-Dade	2,504,614	6.7	Harris (Houston)	4,092,459	8.7
	Broward (Ft. Lauderdale)	1,752,928	8.4	Dallas	2,368,139	9.6
	Palm Beach	1,324,058	8.2	Tarrant	1,809,034	11.5
	Hillsborough (Tampa)	1,233,900	9.6	Bexar	1,714,773	12.1
	Orange (Orlando)	1,148,845	10.6	Travis	1,024,266	11
Five Smallest Counties[2]	Calhoun	14,645	18.0	Sterling	1,143	18.4
	Glades	12,933	35.3	Motley	1,210	10.2
	Franklin	11,538	15.6	Glasscock	1,226	14.1
	Lafayette	8,815	19.6	Foard	1,336	28.5
	Liberty	8,324	16.7	Stonewall	1,490	33.3

Sources: U.S. Census Bureau, "QuickFacts from the US Census Bureau (Florida)," retrieved December 10, 2013; NCES, "Local Education Agency (School District) Universe Survey Data," 2010, http://nces.ed.gov/ccd/pubagency.asp.

[1] Florida school districts are coterminous with counties, so we can use Census data to show which districts have greater population. Texas school districts are not coterminous with counties, so we must aggregate the population of Texas districts to the county level.

[2] With population greater than 1,000. (A number of Texas counties have far smaller populations.)

and smallest counties in each state. (For a map of the entire United States, see the report page at www.edexcellence.net.)

We see that districts in or near cities (such as Houston or Miami) generally have fewer teacher aides per student than those districts farther away. In other words, as districts move away from cities, their staff-to-student ratios go up and the population density of the served area goes down. The three districts in Florida with the highest teacher-aide ratios, for instance, are Glades, Dixie, and Jackson Counties, which have a combined population of less than 80,000. Glades County had a total population of less than 13,000 in 2010, but a ratio of 35.3 teacher aides for every 1,000 students in its district-run schools.

In comparison, Florida's four largest counties each have over one million residents, and are highly urbanized (those containing Miami, Fort Lauderdale, Palm Beach, and Tampa—all in yellow). In contrast to Glades, Miami-Dade

County has a population of over 2.5 million—but only 6.7 teacher aides per 1,000 students.

The story in Texas is largely the same: in 2010, Sterling County had a total population of 1,143, while over four million people lived in Harris County, which includes Houston. Sterling County's teacher-aide ratio is 18.4, while Harris's is 8.7.

The link between urban areas and staff is clear. But while *related* to district variation in the present, urbanicity likely hasn't *driven* growth. To drive personnel growth at all three levels of analysis (national, state, and district) as we've seen in this paper, the U.S. population would need to be moving from urban areas to small, rural towns. But the exact opposite is happening: the United States is becoming an increasingly urbanized country.[34]

COULD SPECIAL EDUCATION PLAY A ROLE IN STAFFING INCREASES?

A common hypothesis for recent staff growth and district variation is that changing student demographics require different types of personnel. The increasing number of children identified with special needs was by far the most common explanation given by district leaders when asked about the growth in non-teaching staff. (That was also the case in conversations with numerous education-policy experts). Autism rates were called out as a major variable in particular, because an autism diagnosis often coincides with an assigned one-on-one aide.

It's a plausible theory, given the last decade of statistics: from 2000–01 to 2009–10, the number of students in the United States diagnosed with autism quadrupled.[35] On average, the specialized staffing and services required for a student with autism cost three times that of the average student's education.[36] California alone saw an increase of 45,000 students with autism over the same decade.[37] Massachusetts enrolled over 30,000 additional students diagnosed with autism or moderate-to-severe health, communication, or neurological impairments from 2003 to 2012.[38]

To test whether non-teacher staffing figures are correlated with diagnosis rates, we regressed staffing ratios against district-level IEP ratios (or "individualized education programs," required for all students who receive special-education services). Controlling for urbanicity and other student demographics,[39] we find that the number of students with an IEP is positively correlated with both the total number of non-teaching personnel in a district and the number of teacher aides (2010).[40] The same correlations hold when comparing the *change* in IEPs over time versus the change in staffing over time.[41]

However, the explanatory power of any single variable or combination of variables—such as number of IEPs,[42] the percentage of students on free or reduced-price lunch, urbanicity, and so on—is quite low. None of the models that we used could explain more than 7 percent of the variation in the number of district non-teaching staff or teacher aides. So what explains the rest? We believe that it is in the hands of district leaders who, as a result of discretionary policies, routinely make a number of decisions relative to staffing and resource allocations (as we explain in the next section).

Conclusion

The story of school staffing over the last half century is, in many ways, the story of American public education writ large. As schools and their mandates have evolved and changed, so too have the personnel walking their halls. Yet large portions of that history have gone virtually untold, the roles (and numbers) of the supporting cast widely ignored in favor of more central characters. This report shines light on this large (and growing) cadre of non-teachers, probing several data sources to create a more detailed picture than has previously been painted. Five key findings emerge:

1. Since 1950, school staffing has increased nearly 400 percent, and non-teaching personnel have played a major part in that growth.

2. We spend far more on non-teaching staff (as a percentage of education spending) than almost any other OECD nation.

3. States vary substantially in their numbers of non-teaching staff, but much of that variation is due to district differences within their borders—such as a large percentage of urban districts.

4. The biggest driver of growth in non-teachers has been the teacher-aide category. ("Other" staff also grew significantly, but it is an opaque collection of many positions.)

5. School districts vary greatly relative to their number of employed personnel, but those differences likely stem from staffing decisions made by leaders.

From these findings, a district's main takeaway should be that while non-teaching staff are more prevalent and necessary than they once were, that does not mean personnel rolls are set in stone. Similar districts staff their schools in very different ways. To find an optimal balance, we offer district leaders three simple recommendations:

First, know both the expanse and limits of authority provided by state, district, and local policies. Leaders often have more flexibility in staffing than they realize or care to embrace—especially if they are conflict averse. They should use the latitude that they have to drive policy based on students' best interests.

Second, be creative when meeting obligations. Instead of an army of teacher aides, for example, a behavioral specialist may be more effective in serving students with special needs.[43] Similarly, an assistive technologies expert can identify tools and technologies that help students achieve independence. And certain blended-learning models can reduce lecture time and provide fine-grained tracking of student progress—while giving teachers extra time in their day to grade papers or plan lessons.

Finally, evaluate the necessity—and cost benefit—of extra staff. Staff positions should be assessed based on their contributions to the school's core mission. If the cost is high and benefit low, those funds would likely be more effective elsewhere. Even if the service itself is necessary, there may be options for providing the service that are more effective, less expensive, or both. To make these comparisons, districts need to conduct robust staff and program evaluations (most do not). With that data, strategic management software can help leaders identify the optimal makeup of their schools.

• • •

How we think about the duties and role of non-teachers, as well as the role of schools in society today, significantly outweighs the attention either has been paid. The sheer size of the non-teaching workforce in American K–12 schooling devours a substantial chunk of education budgets—and it continues to grow. Some of these increases stem from external pressure and inertia. Some are based on conscious (or unconscious) policy decisions made by leadership, adding more hands but not necessarily more value. While teachers face increasing accountability demands, the other half of school staffing remains largely invisible—not because they're difficult to find but because few have bothered to look. A real conversation about the future of U.S. education must consider everyone tasked with providing it. Measured today, we're only about halfway there.

A Appendix A: Sources and Methods

SOURCES

This report uses several data sets provided by the National Center for Education Statistics (NCES), which are not comparable (e.g., state-level figures may not match the summed personnel figures for districts within state borders). The district data set fails to report staff data for every district each year, and individual staff categories frequently have missing data. The differences between state and aggregated district data are fairly trivial in most cases, unless data are systemically missing for a given category or year (see Methods). The national data set groups personnel in a different collection of categories than both district and state data sets—categories that were also redefined in 1980, making it impossible to compare their numbers directly.

For **the national analysis from 1950 to 2010 (Part 1)**, summary data were provided by NCES in their *Digest of Education Statistics: 2012*, reporting on the *Statistics of State School Systems* (various years)*, Statistics of Public Elementary and Secondary Schools* (various years), and their Common Core of Data (CCD). The OECD data are pulled directly from *Education at a Glance, 2013*.

The state analysis (Part 2) relied on data drawn from NCES's *State Nonfiscal Survey Public Elementary/Secondary Education Survey* from 1986–87 to 2010–11. Geographic data were pulled from stock shape files provided by ArcGIS. The Florida case study uses data from the *Florida District Staff Salaries of Selected Positions, 2010–11* report and the *Membership in Florida Public Schools, 2010–11* report, provided by the Florida Department of Education.

The school-district analyses (Part 3) rely on data from the Local Education Agency (School District) Universe Surveys from 1993–94 to 2010–11. For the district mapping data (shape files), we used the Minnesota Population Center's National Historical Geographic Information System: Version 2.0.[44] Case-study data on Arlington Public Schools are from the *Superintendent's Adopted Budget, Fiscal Year 2013*.

METHODS

All personnel numbers are reported in full-time equivalent (FTE), rather than head counts, unless otherwise noted. National and state-level analyses were computed using simple arithmetic, and non-teaching numbers were calculated as the sum of all district- and school-level staff. Table A-1 presents the data used for calculating changes to state non-teaching staff, over time (Figure 6).

For district calculations, non-teaching personnel are all staff minus teachers and district administration. District staff are excluded because their reported district assignments are unreliable (they are reported as staff in "intermediate" units, regional supervisory or "education service agencies," or to their actual district—with no clear way to standardize or differentiate). Non-teaching personnel includes: instructional aides, instructional coordinators, guidance counselors, librarians/media specialists, library/media support staff, school administrators, school administrative support staff, student support services staff, and all other support services staff. For full category descriptions, see Appendix B.

Minnesota, New Jersey, Illinois, and the District of Columbia were dropped from the district analysis due to missing data over subsequent years.

In addition to the district level, some states also reported staff and students at the level of "supervisory union" or "regional education service agency." These units had one or more districts associated with them, as identified in the data. In the case of supervisory unions, only Massachusetts, Vermont, and Virginia reported students as belonging to the union. In those cases, we aggregated data up to the union level, changing the unit of analysis slightly. (In most cases, unions have just a handful of districts associated with them—and most have no students coded to them.) In 2007, Massachusetts began coding supervisory unions as regional education service agencies, but we maintained the associations that existed before the change since figures

TABLE A-1	Data Used to Calculate Non-Teaching Ratios for States						
STATE	RATIO (1986)	RATIO (2010)	Δ	NON-TEACHERS (1986)	NON-TEACHERS (2010)	STUDENTS (1986)	STUDENTS (2010)
South Carolina	43	28	-15	26498	20298	611629	725838
Nevada	39	26	-13	6283	11560.63	161239	437149
Arizona	51	43	-7	27103	46591.73	534538	1071751
Illinois	44	40	-5	80963	82781.7	1825185	2091654
California	44	43	-2	194760	269530.8	4377989	6289578
Massachusetts	53	56	3	43839	53302.68	833918	955563
Hawaii	52	57	5	8601	10307.63	164640	179601
Florida	53	60	6	85670	157573.9	1607320	2643347
Washington, D.C.	70	77	7	5961	5455.79	85612	71284
New Jersey	58	66	8	63983	92431.2	1107467	1402548
Texas	59	67	8	188601	330421.6	3209515	4935715
Delaware	50	58	8	4714	7544.97	94410	129403
Michigan	57	66	9	91589	104871.9	1597154	1587067
Montana	54	63	9	8229	8888.09	153327	141693
Washington	38	48	10	28890	49848.76	761428	1043788
Wisconsin	42	53	11	32347	46275.5	767819	872286
Oklahoma	51	62	11	30212	40983.9	593183	659911
Rhode Island	40	52	12	5401	7419.94	134690	143793
Colorado	50	63	13	27833	52883.28	558415	843316
Oregon	49	62	13	21983	35493.46	449307	570720
Missouri	53	67	14	42707	61554.3	800606	918710
Tennessee	49	62	14	39865	61638.5	818073	987422
West Virginia	53	67	14	18722	18931.75	351837	282879
Alabama	46	61	14	33936	45781.24	733735	755552
Utah	31	46	15	12749	26664.25	415994	585552
North Carolina	48	64	15	52525	94681.43	1085248	1490605
Idaho	28	44	16	5805	12110.89	208391	275859
Mississippi	56	73	17	27926	35611.48	498639	490526
Iowa	54	71	17	25867	34972.85	481286	495775
New York	57	74	17	148842	202365.6	2607719	2734955
Maryland	49	67	17	33440	56938.9	675747	852211
Louisiana	57	75	18	45661	52225.48	795188	696558
United States	**49**	**67**	**18**	**1992336**	**3096113**	**39753172**	**49484181**
Georgia	49	68	20	53436	114727.9	1096425	1677067
Kansas	48	68	20	20163	33107	416091	483701

TABLE A-1	Data Used to Calculate Non-teaching Ratios for States (cont'd.)						
STATE	RATIO (1986)	RATIO (2010)	Δ	NON-TEACHERS (1986)	NON-TEACHERS (2010)	STUDENTS (1986)	STUDENTS (2010)
New Mexico	48	71	23	13672	24081.9	281943	338122
Indiana	53	77	24	51586	80681	966780	1047232
Nebraska	52	78	26	13828	23163.91	267139	298500
Minnesota	41	67	27	28879	56321.6	711134	838037
Pennsylvania	49	76	27	82093	136884.4	1674161	1793284
Ohio	47	75	28	83902	131929.7	1793508	1754191
Arkanas	49	79	30	21428	37912	437438	482114
North Dakota	50	81	31	5914	7822.23	118703	96323
South Dakota	47	80	33	5872	10033.39	125458	126128
Kentucky	52	85	33	33214	57183.4	642778	673128
Wyoming	71	104	34	7125	9296.43	100955	89009
Connecticut	51	89	38	23979	50136.56	468847	560546
New Hampshire	49	90	41	8087	17589.9	163717	194711
Alaska	32	75	43	3500	9931.46	107848	132104
Maine	44	91	47	9281	17164.5	211752	189077
Virginia	52	104	52	50314	130100.1	975135	1251440
Vermont	49	104	55	4558	10103.14	92112	96858

Source: NCES, "State Nonfiscal Public Elementary/Secondary Education Survey Data (1986–87, 2010–11)," http://nces.ed.gov/ccd/stnfis.asp

were similar before and after at both the district- and intermediate-unit levels. We allocated supervisory union staff to their associated districts.

Regional education service agencies (ESAs) are more complicated because they do not come with information on the districts associated with that particular unit. Aggregating students and staff with the method used for supervisory unions is therefore not possible. For that reason, we treated all ESAs as districts unless their non-teaching staff-to-student ratio was more than two standard deviations above or below the national mean. This is a standard definition of a statistical outlier and provides an unbiased and effective cutoff. If an ESA's non-teaching ratio was greater than the outlier threshold, its staff and students were distributed proportionately to other districts in the state, weighted on enrollment.

We also omitted charter schools from the data set. We did not do so lightly, since dropping them eliminated a great deal of variation in staffing patterns (charters have significantly fewer non-teaching personnel than district schools). However, in many states independent charter schools are reported as their own, single-school LEAs. By including both districts and schools as the unit of analysis, we would have introduced false comparability. Even more problematic is that states appear to change their charter reporting methods from year to year. Simply dropping states/districts with the problematic charter data on a case-by-case basis was not an option since doing so affected the results significantly—and prompted serious questions about accuracy.

Finally, we merged "library support staff" with "library staff" and "administrative support staff" with "administrators," as the sum of their reported positions. However if the relative "support" position was left empty by the reporting agency and the supervisory position was reported, we assumed that the positions had been combined into the supervisory figure and reported the category as such. Spot-checks of the data confirm this was a valid approach.

Following the data cleaning, we conducted several analyses. To find non-teaching staff-to-student ratios for 1993–2010**,** we first calculated in each district the *category*-to-students ratio for each staff category (meaning "other" staff, aides, school administration, student support services, guidance counselors, library staff, and instructional coordinators). Second, we averaged that ratio across all districts to glean the national average for each category, each year. Third, we summed those averages to create the average non-teaching personnel across all districts, 1993–2010. To calculate non-teachers by urbanicity (Figure 8), we used the same technique, except in step three we summed districts relative to their urbanicity, rather than nationally. The Texas and Florida map data (Figure 9) simply borrowed from the calculations done in step one, for teacher aides.

This method made more sense (versus the method used in our regression analysis) when compared against the disaggregated numbers presented earlier in the paper (Figure 7) and mitigated problems associated with missing data. In the regression analysis, we were forced to calculate non-teaching staff by summing that district's staff categories, in order to arrive at a total number of non-teaching staff for each district. Each district missing data in only one or two categories, however, is then listed as missing a non-teaching data point. For the purposes of a regression, this adjustment was necessary. For the descriptive statistics, however, it was not.

To better understand the difference between calculations, imagine we have a country of three districts (Table A-2, vertical axis) and districts have just four categories of non-teaching personnel (horizontal axis). In order to calculate the national average for non-teaching, we can either average the red column or sum the orange row (red being the inferior and orange being the superior method). The red cells are the total number of non-teaching personnel for that row's district. District 1, for example, has 52.1 non-teachers. The orange cells, on the other hand, average all of the districts in the country for that particular category. The national average for teacher aides, for instance, is 14.5. When we average the red cells, the national average equals 47.5, but if we sum the orange cells the average is 55.6. The problem lies in the missing data in District 3, which removes our ability to sum District 3's categories to calculate a non-teaching total for the district (without

imputing). The orange technique still works, however, because averaging the districts simply ignores District 3. This method maximizes the number of observations and better aligns with the other analyses in the paper (since most were calculated using disaggregated data, i.e., the orange cells). The regression analysis, however, used the red-cell data, since we were regressing district variables against one another.

The regression analysis (page 28) tested the relationship between staff ratios (non-teaching and aides) and key variables (including IEPs). We regressed the ratios against a number of factors identified as potentially important (district IEP-to-enrollment ratios, urbanicity, percentage of black students, percentage of students receiving free and/or reduced-price lunch, and the number of ELL students). We ran four different regressions. First, for 2010, we regressed non-teaching staff-to-student ratios against these selected variables, and then did the same for aide-to-student ratios. Second, we calculated the change from 2000 to 2009 for all variables (except urbanicity, which were based on their values in 2000) and ran the same analyses using change-over-time instead of single-year (2010) data. Results for all four analyses appear in Tables A-3 through A-6.

ANALYSIS OF ARLINGTON PUBLIC SCHOOLS (APS)

In order to calculate the number of APS staff in each position, we summed all the staff assigned to an individual elementary, middle, or high school, not counting "other" schools. We did not include pre-K staff. Other details on categories: 1) Any position with the word "teacher" in it was designated a teaching position, 2) front-office staff includes all clerical positions, "coordinator" positions, and other administrative staff, 3) counselors include "job placement" staff, 4) teacher aides also include "math coach" and "health education" positions (not coded as "teacher"). Unlike other positions, cafeteria, transportation, and maintenance staff numbers are not assigned to individual schools but are reported at the district level, so those numbers were gathered from their requisite sections in the budget. (Numbers were also adjusted based on district input, including the addition of grant-based staff who are not included in the district budget.)

TABLE A-2	Calculating Non-Teaching Personnel (Example)				
Name	**Teacher Aides**	**"Other" Staff**	**Library Staff**	**Guidance Staff**	**District Non-Teaching Total**
District 1	15.2	30.1	2.8	4.0	52.1
District 2	9.9	27.5	3.1	2.4	42.9
District 3	18.3	34.3	1.4	missing	missing
National Average for Category	14.5	30.6	7.3	3.2	**National Average for Non-Teaching**

TABLE A-3	Non-Teaching Staff-to-Student Ratio (2010)					
	COEF.	**STD. ERR.**	**t**	**P>t**	**[95% CONF. INTERVAL]**	
IEP Ratio	0.08979	0.0057	15.67	0.000	0.079	0.101
Urban Dummy	-0.01332	0.0011	-12.65	0.000	-0.015	-0.011
Suburb Dummy	-0.00954	0.0007	-14.28	0.000	-0.011	-0.008
Town Dummy	-0.00619	0.0006	-10.69	0.000	-0.007	-0.005
% Black	0.00831	0.0016	5.32	0.000	0.005	0.011
% FRL	0.01292	0.0037	3.47	0.001	0.006	0.020
% ELL	0.00308	0.0013	2.35	0.019	0.001	0.006
_cons	0.05650	0.0009	60.98	0.000	0.055	0.058
	Adj R-squared	**0.068**		**Number of obs**		**9347**

TABLE A-4	Aide-to-Student Ratio (2010)					
	COEF.	**STD. ERR.**	**t**	**P>t**	**[95% CONF. INTERVAL]**	
IEP Ratio	0.05491	0.00283	19.38	0.000	0.049	0.060
Urban Dummy	-0.00403	0.00054	-7.53	0.000	-0.005	-0.003
Suburb Dummy	-0.00287	0.00034	-8.47	0.000	-0.004	-0.002
Town Dummy	-0.00064	0.00029	-2.18	0.029	-0.001	0.000
% Black	0.00077	0.00079	0.97	0.330	-0.001	0.002
% FRL	0.01469	0.00187	7.87	0.000	0.011	0.018
% ELL	-0.00501	0.00065	-7.69	0.000	-0.006	-0.004
_cons	0.01348	0.00046	29.33	0.000	0.013	0.014
	Adj R-squared	**0.0466**		**Number of obs**		**9620**

TABLE A-5	Change in Non-Teaching Staff-to-Student Ratio (2000–2009)					
	COEF.	STD. ERR.	t	P>t	[95% CONF. INTERVAL]	
Change in IEPs	0.05467	0.00701	7.79	0.000	0.041	0.068
Urban Dummy	-0.00160	0.00117	-1.38	0.169	-0.004	0.001
Suburb Dummy	-0.00594	0.00069	-8.65	0.000	-0.007	-0.005
Town Dummy	-0.00293	0.00063	-4.67	0.000	-0.004	-0.002
Change in Black %	0.00609	0.01223	0.50	0.619	-0.018	0.030
Change in FRL %	0.01975	0.00288	6.85	0.000	0.014	0.025
Change in ELL %	-0.00030	0.00735	-0.04	0.968	-0.015	0.014
_cons	0.00945	0.00043	21.94	0.000	0.009	0.010
Adj R-squared	**0.0374**			**Number of obs**		**4885**

TABLE A-6	Change in Aide-to-Student Ratio (2000–2009)					
	COEF.	STD. ERR.	t	P>t	[95% CONF. INTERVAL]	
Change in IEPs	0.03178	0.00276	11.51	0.000	0.026	0.037
Urban Dummy	-0.00256	0.00046	-5.58	0.000	-0.003	-0.002
Suburb Dummy	-0.00093	0.00031	-3.01	0.003	-0.002	0.000
Town Dummy	-0.00089	0.00028	-3.18	0.001	-0.001	0.000
Change in Black %	0.01291	0.00519	2.49	0.013	0.003	0.023
Change in FRL %	0.00035	0.00122	0.29	0.774	-0.002	0.003
Change in ELL %	0.00758	0.00253	2.99	0.003	0.003	0.013
_cons	0.00436	0.00019	23.33	0.000	0.004	0.005
Adj R-squared	**0.0235**			**Number of obs**		**7039**

| TABLE A-7 | Number of Personnel per 1,000 Students, by Urbanicity |

	TEACHER AIDES				STUDENT SUPPORT			
Year	City	Suburb	Town	Rural	City	Suburb	Town	Rural
1993	12.4	10.6	11.8	12.4	3.1	3.4	2.7	3.4
2010	14.5	18.2	19	20	6.1	6	6	5.8
Δ	2.1	7.6	7.2	7.6	3	2.6	3.3	2.4

	SCHOOL ADMINISTRATION				"OTHER" STAFF			
Year	City	Suburb	Town	Rural	City	Suburb	Town	Rural
1993	7.3	8.4	6.9	7.3	24	23.9	23.7	30.1
2010	8.7	8.3	8.9	10	22.2	23.6	26.3	31.7
Δ	1.4	0.1	2	2.7	-1.8	-0.3	2.6	1.6

B Appendix B: Position Glossary

Position descriptions from NCES, Digest of Education Statistics.

Teachers: Teachers are defined as individuals who provide instruction to pre-kindergarten, kindergarten, grades 1 through 12, or ungraded classes; or individuals who teach in an environment other than a classroom setting and maintain daily student attendance records.

Non-Teaching Personnel: All of the below, added together. (District Administration is not included in calculations, unless otherwise noted.)

Instructional Aides (Teacher Aides): Staff members assigned to assist a teacher with routine activities associated with teaching, i.e., activities requiring minor decisions regarding students, such as monitoring, conducting rote exercises, operating equipment, and clerking. Includes only paid staff, and excludes volunteer aides.

Instruction Coordinators and Supervisors: Supervise instructional programs at the school district or sub-district level and are defined as educational television staff; coordinators and supervisors of audio-visual services; curriculum coordinators and in-service training staff; Chapter 1 and home-economics supervisors; staff engaged in the development of computer-assisted instruction. School-based department chairpersons are excluded.

Guidance Counselors: Professional staff assigned specific duties and school time for any of the following activities in an elementary or secondary setting: counseling with students and parents; consulting with other staff members on learning problems; evaluating student abilities; assisting students in making educational and career choices; assisting students in personal and social development; providing referral assistance; working with other staff members in planning and conducting guidance programs for students.

Library Staff (librarians and support staff): Librarians are defined as professional staff members and supervisors assigned specific duties and school time for professional library services activities. This includes selecting, acquiring, preparing, cataloguing, and circulating books and other printed materials; planning the use of the library by students, teachers, and instructional staff; and guiding individuals in use of library books and material maintained separately or as a part of an instructional materials center.

District Administration (LEA administrators and LEA support staff): LEA administrators are chief executive officers of the education agencies, including superintendents, deputies, and assistant superintendents; other persons with district-wide responsibilities, e.g., business managers, administrative assistants, professional instructional support staff, Chapter I coordinators, and home-economics supervisors. Excludes supervisors of instructional or student support staff.

Administrative staff provide direct support to LEA administrators, including secretarial and other clerical staff.

School Administration (school administrators and administrative support staff): [School administrators are] members whose activities are concerned with directing and managing the operation of a particular school; including principals, assistant principals, other assistants; and those who supervise school operations, assign duties to staff members, supervise and maintain the records of the school, and coordinate school instructional activities with those of the education agency, including department chairpersons.

School administrative support staff are staff whose activities are concerned with support of the teaching and administrative duties of the office of the principal or department chairpersons; and includes clerical staff and secretaries.

Student Support Services: Staff members whose activities are concerned with the direct support of students; and who nurture, but do not instruct, students. Includes attendance officers; staff providing health, psychology, speech pathology, audiology, or social services; and supervisors of the preceding staff and of health, transportation, and food service workers.

Other Support Staff ("other" staff): All other staff who serve in a support capacity and are not included in the categories of central office administrative support, library support, or school administrative support; e.g., social workers, data processing, bus drivers, and health, equipment maintenance, security, and cafeteria workers.

Endnotes

1. National Center for Education Statistics (NCES), *Digest of Education Statistics*, "Staff employed in public elementary and secondary school systems, by type of assignment: Selected years, 1949-50 through fall 2010," Table 92, 2012, http://nces.ed.gov/programs/digest/d12/tables/dt12_092.asp.

2. Ibid., Table 35.

3. Ibid.; Organization for Economic Cooperation and Development (OECD), "OECD Education at a Glance, 2010 Indicators," 2013, http://www.oecd.org/edu/educationataglance2013-indicatorsandannexes.htm.

4. Benjamin Scafidi, *The School Staffing Surge: Decades of Employment Growth in America's Public Schools* (Indianapolis, IN: Friedman Foundation for Educational Choice, October 2012), http://www.edchoice.org/Research/Reports/The-School-Staffing-Surge--Decades-of-Employment-Growth-in-Americas-Public-Schools.aspx.

5. Ibid.

6. NCES, *Digest of Education Statistics*, Table 92.

7. Noelle Ellerson, *Weathering the Storm: How the Economic Recession Continues to Impact School Districts* (Alexandria, VA: American Association of School Administrators, March 2012), https://www.aasa.org/uploadedFiles/Policy_and_Advocacy/files/Weathering_the_Storm_Mar_2012_FINAL.pdf.

8. See http://opportunityculture.org/.

9. Lindsey Burke, "How Escalating Education Spending is Killing Crucial Reform" (Washington, D.C.: Heritage Foundation, October 2012), http://www.heritage.org/research/reports/2012/10/how-escalating-education-spending-is-killing-crucial-reform; Scafidi, *The School Staffing Surge*.

10. NCES, *Digest of Education Statistics*, Table 92.

11. Ibid., Tables 35 and 37.

12. Ibid., Table 92.

13. We used 2009 as the comparison year because a significant number of teacher positions were eliminated between 2009 and 2010 (likely due to the 2008 recession), skewing the trend. In 2000 there were 62.3 teachers per 1,000 students; in 2009 there were 65.0 teachers—but a year later there were 62.6.

14. Student support staff includes school nurses, psychologists, audiologists, social workers, etc. See Appendix B for full definitions of all staff.

15. Prior to 1970, instructional aides were included in the "teacher" category.

16. In 1980, NCES revised its position classifications. Because of these revisions, support staff and instructional aide numbers *before* 1980 can only be roughly compared to the number *after* 1980. The definitions of the positions changed, so "instructional aide" did not mean exactly the same thing in 1981 as in 1971. (NCES does not explain how or why they revised the classifications.) But significant growth in personnel began before the definitions were revised, and then continued after the new definitions were established. Given that reality, the reclassifications of positions could not have played a major part in our results.

17. Organization for Economic Cooperation and Development (OECD), "Education at a Glance 2013: Indicators and Annexes," Table D4.1, http://www.oecd.org/edu/educationataglance2013-indicatorsandannexes.htm.

18. OECD, "Education at a Glance 2011," Chart D4.1, http://www.oecd.org/education/skills-beyond-school/48631419.pdf.

19. Amanda Ripley, *The Smartest Kids in the World: And How They Got That Way* (New York: Simon & Schuster, 2013).

20. Don Cameron, *Educational Conflict in the Sunshine State: The Story of the 1968 Statewide Teacher Walkout in Florida* (Washington, D.C.: R&L Education, September 2008).

21. Data on urban populations are from the U.S. Census Bureau, 2000 Census of Population and Housing, Population and Housing Unit Counts PHC-3.

22. U.S. Census Bureau, "United States Summary: 2010, Population and Housing Unit Counts," September 2012, http://www.census.gov/prod/cen2010/cph-2-1.pdf.

23. The ten jurisdictions were the District of Columbia, Louisiana, Maine, Michigan, Mississippi, Montana, North Dakota, Ohio, West Virginia, and Wyoming. See: NCES, State Nonfiscal Survey Public Elementary/Secondary Education Survey.

24. The data come from "Florida District Staff Salaries of Selected Positions (2010–11)" which only reports on major staff categories. The Florida DOE does not provide staff or salary data on positions outside the scope of this report. All positions are reported as head counts of full-time employees (whereas the federal data are FTE).

25. In 2010, the average standard deviation (SD) between districts residing in the same state was 39.9 non-teaching staff per 1,000 students (nationally). The SD across states was 15.2.

26. As the catch-all, it is similar to the "support staff" category in our national-level analysis (Part 1), though it includes fewer positions. This is why, in Figure 7, the slope of "other" staff is shallow compared to the slope of support staff in Figure 3. Student support services, library assistants, front-office administrative assistants, and district administrative assistants are all included in support staff, but not in "other" staff.

27. In Figure 3 the number of teachers per 1,000 students is 62.6 (2010). If we sum all teachers and students in the district dataset, the ratio is 61.9 teachers per 1,000 students.

28. Arlington Public Schools, "Superintendent's Approved Budget, Fiscal Year 2013"; Virginia Department of Education, "School Year 2013–2014

National School Lunch Program (NSLP) Free and Reduced-Price Eligibility Report," Program Statistics & Reports, February 2014, http://www.pen.k12.va.us/support/nutrition/statistics/free_reduced_eligibility/2013-2014/divisions/frpe_div_report_sy2013-14.pdf.

29. While urbanicity is related to many variables, the most obvious is district population density. In fact, when districts are broken into quartiles based on population per square mile, the relationship is very similar to the one demonstrated in Figure 8.

30. See Table A-7, page 35, for student support and school administration data.

31. By comparing districts within the same state, we can be confident that the observed staffing trends are not an artifact of state-level policy. In other words, we can rule out that highly urban states (like Texas and Florida) have state policies that force all school districts to have low staff-to-student ratios, and rural states have policies that force school districts to have high ratios.

32. The difficulty in recruiting specialized staff was mentioned in three of our interviews.

33. Patrick J. Carr and Maria J. Kefalas, *Hollowing Out the Middle: The Rural Brain Drain and What It Means for America* (Boston: Beacon Press, 2009).

34. See http://www.census.gov/prod/cen2010/cph-2-1.pdf. This trend is also supported by our enrollment data: city and suburban districts enrolled 66.7 percent of students in 2000 and 68 percent in 2010. Rural and town districts enrolled 33.3 percent in 2000 and 32 percent in 2010.

35. Janie Scull and Amber M. Northern, *Shifting Trends in Special Education* (Washington, D.C.: Thomas B. Fordham Institute, May 2011), http://www.edexcellence.net/publications/shifting-trends-in-special.html.

36. Thomas Parrish, "Who's Paying the Rising Cost of Special Education?" *Journal of Special Education Leadership* 14, no. 1 (April 2001), http://www.casecec.org/documents/JSEL/JSEL_14.1.pdf.

37. California Department of Education, "Data Quest," last modified August 21, 2013, http://dq.cde.ca.gov/dataquest/.

38. Massachusetts Association of Approved Private Schools (MAAPS), *The Bottom Line Report: Understanding Rising Special Education Costs in Massachusetts and the Real Cost to State Taxpayers* (Wakefield, MA: MAAPS: Exceptional Schools for Exceptional Children, December 2012), http://www.napsec.org/MAAPS%20Cost%20Study.pdf.

39. For all analyses we controlled for: urbanicity (city, suburb, town, rural), percentage of black students, percentage of students receiving services for English language learners, and students eligible for free or reduced-price lunch.

40. We also compared IEPs to the other large staffing category, "other" personnel, but the results were not statistically significant.

41. Measured by subtracting the ratios in 2000 from the ratios in 2009.

42. We recognize, of course, that individual education programs (IEPs) are an imperfect measure of student need. Because their number does not reflect severity of disability, it is possible, even likely, that some of the unexplained variation in staffing is due to unaccounted variation in student need. Yet statistically, larger districts with similar numbers of IEPs should have similar proportions of students with severe disabilities. So, to test the measure, we eliminated the smaller districts in our sample, defined as having fewer than 3,800 students (the average enrollment nationwide). This elimination resulted in a weaker association between IEPs and staffing, as well as decreased explanatory power. As an added precaution, we then removed very large districts—those with more than 25,000 students, two standard deviations above the mean—in the event that they were skewing the data. Yet there was negligible change in the results. In short, IEP counts may be an imperfect measure, but their lack of specificity does not appear to affect the reliability of our results.

43. Nathan Levenson, "Strategies for Smarter Budgets and Smarter Schools," (Washington, D.C.: Thomas B. Fordham Institute, December 2012), http://edexcellence.net/publications/strategies-for-smarter-budgets-and-smarter-schools.html.

44. Minnesota Population Center, *National Historical Geographic Information System: Version 2.0*, (Minneapolis, MN: University of Minnesota, 2011), http://www.nhgis.org.