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Michigan Teacher Shortage Study: Comprehensive Report

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Michigan Teacher Shortage Study: Comprehensive Report

AUTHORS

Tara Kilbride, *Assistant Director for Research, EPIC*

Katharine O. Strunk, *Faculty Director, EPIC*

Salem Rogers, *Research Assistant, EPIC*

Meg Turner, *Project Manager, EPIC*

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Section One: Introduction

As the COVID-19 pandemic has continued, there have been growing concerns about teacher burnout exacerbating existing teacher shortages, both nationally and in Michigan (e.g., Cohen, 2022; Mauriello & Higgins, 2022; Querolo et al., 2022). In the face of these persistent and potentially worsening shortages, it is critical to understand the scope of the problem to appropriately inform actions at state and local levels to ensure that schools and districts are fully staffed to best support their students.

PURPOSE OF THIS REPORT

This report is the second in a series of annual reports required by the Michigan legislature in December 2020 (2020 PA 316). The report was prepared by the Education Policy Innovation Collaborative (EPIC) at Michigan State University in collaboration with the Michigan Department of Education (MDE) and the Center for Educational Performance and Information (CEPI).

As stipulated in 2020 PA 316, EPIC released an initial report in January 2022 that summarized the existing sources of state administrative data that were available at the time to begin to quantify the shortage, provided a baseline from which future comprehensive data analyses can begin, and outlined several recommendations to policymakers about data-gathering activities that are necessary for future comprehensive reports (2020 PA 316). The purpose of this second report, and all future annual reports in this series, is to provide a more comprehensive analysis of Michigan's teacher shortage, including information about teacher vacancies, teacher retention rates, and candidates completing in-state teacher preparation programs.

In addition to updating the baseline analyses from EPIC's initial report, we've adjusted and expanded on the initial metrics based on the results from the previous report, recommendations from the National Council on Teacher Quality (NCTQ, 2021), and newly available or improved data. We also examine differences across geographic regions, subject areas, educational settings, demographic groups, and experience levels. These data begin to paint a picture of the teacher shortage across Michigan and highlight areas where new or better data can help to flesh out details of the shortage and help policymakers to target policies and programs in ways that can best help the state and local communities grow their teacher workforces.

Section Two: Data and Methods

The analyses in this report draw from several data sources, each of which provides different types of information about the population of Michigan teachers and the needs of Michigan students and schools. In our initial report, we summarized the strengths and weaknesses of these data sources and offered several recommendations for improving these data or collecting additional data that would enable researchers to better understand the extent of Michigan's teacher shortage. In this section, we describe the specific data sources we use in the current report, provide status updates about each of the recommendations we made in our previous report, and summarize the key metrics we use in this report and the methods we use to calculate them.

DATA SOURCES

For a more thorough discussion about *all* the existing state administrative data sources that may help provide context and scope to the discussion about and understanding of teacher shortages in Michigan, please see EPIC's initial report.

Registry of Educational Personnel

The Registry of Educational Personnel (REP) collects basic employment information about all individuals working in traditional public school (TPS) districts and public school academy (PSA, or charter) districts in Michigan. These data include demographic information (e.g., race/ethnicity, gender, age), employment records (e.g., employment status, dates of employment), and details of employees' assignments (e.g., role, location of assignment, content area). Districts are also asked to report information about funded positions that are vacant. Longitudinal datasets for researchers contain historical data from past REP collections as early as the 2003-04 school year, however, some reporting fields and requirements have changed over time.

Michigan Student Data System

The Michigan Student Data System (MSDS) collects student-level data for state and federal reporting, as well as for funding allocations. Although these data pertain to students rather than teachers, we can use information from the MSDS General Collection to understand the size and characteristics of Michigan's student population,

which can in some ways proxy the demand for teachers in particular areas or with particular credentials. Longitudinal student-level datasets contain historical data from MSDS collections as early as the 2009-10 school year, though some reporting fields and requirements have changed over time. The Teacher Student Data Link (TSDL) collection within MSDS identifies the teacher of record for each of a student's courses. This level of granularity may allow us to better assess which types of students are most affected by shortages. Although the TSDL collection began in 2010-11, it was reduced to only a subset of students starting in 2015-16. As of 2020-21, it is now once again a required collection for all students.

Michigan Online Educator Certification System

The Michigan Online Educator Certification System (MOECS) is a secure web-based system that allows educators to apply for and renew their certificates/licenses as well as input and store professional learning hours necessary for certificate/licensure renewal. The system allows schools and districts to apply for temporary credentials, such as substitute teaching permits and special education approvals, for their educators. Additionally, it is used to collect demographic information (e.g., gender, ethnicity, age), educator preparation program records, and criminal conviction history supporting school safety legislation. MOECS is a rolling database, meaning that data are updated continuously throughout the year and not during specific collection periods. However, CEPI takes snapshots twice a year to coincide with when the REP is collected and includes these data within the datasets provided to researchers for approved studies. These snapshots are available for the 2011-12 end-of-year collection and all subsequent collection periods.

Title II

Title II reports are publicly available through the U.S. Department of Education. The data file is a culmination of data submitted annually by each state department of education, as well as the teacher certification testing vendor, and state-approved teacher preparation providers. These data include program enrollment and completion rates by subject area, major, and program area; licensure test participation and results; and narratives with summary information about Michigan's teacher preparation programs and the systems in place for preparation and certification, for both traditional and alternative route programs.

UPDATES ON INITIAL DATA RECOMMENDATIONS

EPIC's initial report discussed the strengths and weaknesses of these data sources and outlined several recommendations aimed to improve researchers' and the state's ability to study Michigan's teacher shortage. As we noted last year, many of these changes will take years to implement, and some will require legislative action. Here, we provide updates on where each of our recommendations currently stands.

Legislatively Require Vacancy Reporting, Collect Additional Details About Vacancies, and Require More Timely Reporting of Personnel Changes

As we noted in our initial report, the reporting requirements in Section 19 (3) of MCL 388.1619 currently apply only to educational personnel (and not to unfilled vacancies), and only require reporting twice per year. Changes to this language could greatly improve data quality and coverage. At this time, no legislative action has been taken to update these reporting requirements.

However, MDE and CEPI are partnering to develop a new educator employment and credentialing system, called the Michigan Online Registry of Educators (MORE), that will eventually replace both the REP and MOECS and will be better equipped to capture information about vacancies and personnel changes. The new system will align with national standards, resulting in more precision in the data elements collected. MDE and CEPI are also working closely with the national standards community to ensure that the new system will delineate clearly between *teaching positions* and the *teachers assigned to those positions*. Once MORE is deployed, the state will move closer to gaining a more accurate picture of vacancies in future collections.

Still, developing this modernized educator data system is a long-term effort and will take years to complete. Moreover, although the new MORE system will have the capability to collect frequent data about vacant and filled positions, efforts will be limited by the current legislated requirement that districts provide the information only twice a year. Legislative action will be necessary to collect more meaningful statewide data about vacancies and personnel changes.

Investigate Factors That May Contribute to Inaccurate or Incomplete Reporting and Introduce Additional Data Quality Checks, Guidance, and Training for Districts to Improve Reporting

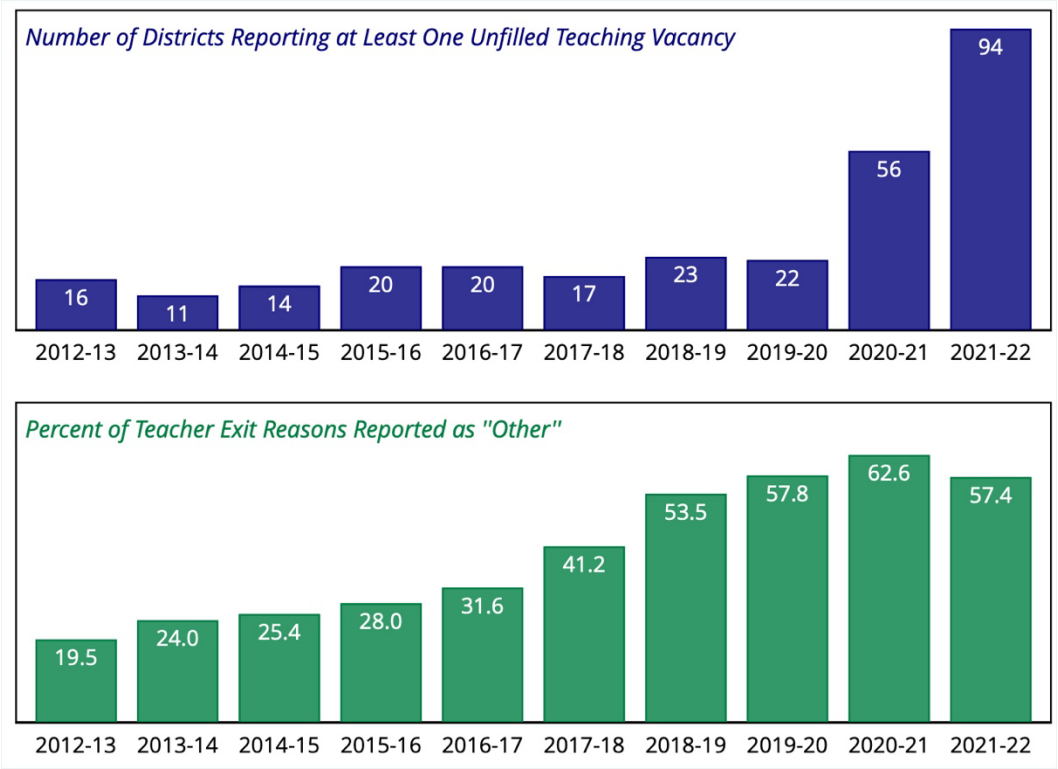
Over the past year, MDE and CEPI have disseminated several communications about the importance of reporting vacancies accurately, including memos from MDE and a focused training from CEPI at the spring 2022 Michigan Pupil Accounting and Attendance Association (MPAAA) conference. CEPI has introduced several new data quality checks to help improve the accuracy of data that districts report in the REP and TSDL by assisting districts in confirming who is recorded as the teacher of record for each course, ensuring educators are reported with assignment codes that align with the courses they teach, and alerting districts about possible errors or gaps in their data.

Recent trends in the data show possible signs of improvement in reporting practices in response to these targeted communications and increased data quality checks. The top panel of Figure 2.1 shows that, in each school year from 2012-13 to 2019-20, very few districts reported any unfilled teaching vacancies at all in the REP (between 11 and 23 districts each year, while there are nearly 900 districts in the state). This increased to 56 districts in 2020-21 and 94 districts in 2021-22. Although more districts reported unfilled teaching vacancies in 2021-22 than ever before, this still represents only about 11 percent of districts in the state. Moreover, several districts that were reported in the media to have several unfilled teaching vacancies that year were not among the 94 that reported vacancies in the REP.

Similarly, we find evidence of possible improvements in reporting the reasons why teachers terminated their employment. As the bottom panel of Figure 2.1 shows, the percentage of teacher exits that did not fit into one of the available categories (i.e., those with the exit reason listed as "other") increased every year from 2012-13 to 2020-21, comprising the majority of all teacher exits since 2018-19. In 2021-22, the percentage of teacher exits reported with the reason as "other" decreased for the first time. This may be related to a recently added data quality check that creates an alert if a district frequently reports employee exits with the same exit reason.

While these changes provide encouraging evidence suggesting that MDE and CEPI's targeted communications and additional data quality checks may have been effective in improving districts' reporting practices, we cannot completely disentangle changes in reporting from actual changes in teaching vacancies and exit reasons. These trends may be driven at least in part by a true increase in the number of districts that experienced teaching vacancies or a true decrease in the percentage of teachers who exited for a reason that doesn't fit into any of the available categories.

Figure 2.1. Possible Improvements in the Reporting of Teaching Vacancies and Exit Reasons



Continue Efforts to Establish a Link Between Student and Education Personnel Datasets

MDE and CEPI have been working toward improved linking between student and educator datasets. As part of these ongoing efforts, CEPI's identity management team has been working closely with EPIC and other partners to develop, validate, and improve a crosswalk between identification codes from the student and educator data systems that belong to the same person. Linking students' unique identification codes (UICs) to their personnel identification codes (PICs) will enable researchers to study prospective educators' experiences in the teacher pipeline longitudinally from their time as students to their eventual credential and employment outcomes. CEPI is also working to procure and implement a system to establish a single, unique identifier that will be used for both students and teachers as well as any other "person" record that CEPI collects.

Incorporate Additional Data From MDE and, if Feasible, External Data Sources Into Researcher Datasets

The state has entered into a new data-sharing agreement with EPIC to provide additional data about teachers and teacher candidates in Michigan. These data include

information about student teaching placements for candidates completing a Michigan teacher preparation program, information from applications for substitute teaching permits that will provide more insight about why, how, and for how long districts are using substitutes to fill longer-term teaching vacancies, and information about Michigan educators who work in a nonpublic school. MDE and CEPI have also been working to improve and expand upon the currently available researcher files to include additional data available at the state with an implementation goal of fall 2023.

Independently, EPIC has begun collecting data about teacher compensation from Michigan districts' collective bargaining agreements, including salary schedules, policies governing teachers' placement and advancement on the salary schedule, and financial incentives that districts offer to recruit or retain teachers. We are continuing to explore other external data sources and evaluate their usefulness for studying Michigan's teacher shortage and their compatibility with state datasets.

Use Surveys to Supplement Administrative Data and Provide More Context About the Experiences of Teachers and Administrators

Before developing any new surveys, the first step we identified in the initial report was to examine data available from previous and ongoing surveys. To assist with this, MDE compiled information about all their current educator surveys. These include a suite of surveys about teacher candidates' preparedness to teach, as perceived by the teacher candidates themselves upon completing their initial student teaching placement, supervisors from in-state teacher preparation programs who are assigned to these candidates, and the cooperating teachers with whom the candidates completed their initial student teaching placements. MDE administers similar annual surveys to graduates from in-state teacher preparation programs a year after they receive their initial certificates and lead administrators working with first-year teachers. EPIC researchers are reviewing these survey instruments, as well as educator surveys from several ongoing EPIC studies, to identify gaps in the topics and populations surveyed where additional survey data would be most helpful to improve our understanding of teacher shortages in Michigan.

Summary of Updates

Overall, there has been progress regarding several of these recommendations, but most are in their early stages and will take more time to implement. As such, the metrics for this report (described in the next subsection) are still affected by many of the same limitations as those in last year's report. Each year, we will continue to incorporate new or improved data as they become available.

METRICS OF INTEREST

For the initial report, EPIC, MDE, and CEPI collaborated to identify a list of metrics of interest based on the requirements in the legislation, the data readily available for the initial report, and a review of resources and reports from other states related to teacher shortage. This year we've refined and expanded on this list based on newly available data, results from the initial report, and guidelines from the National Council on Teacher Quality regarding best practices for state reporting about teacher supply and demand (NCTQ, 2021).

EPIC researchers consulted with data experts from MDE and CEPI before determining the specific definitions, rules, and calculation methods for each of these metrics. Where appropriate, we align our definitions as closely as possible with similar calculations that MDE or CEPI have published in other reports. However, in some cases, EPIC developed slightly different definitions to tailor our analyses to address the specific topics of interest for this report. As we discuss each metric throughout this section, we note any known differences between our definitions and those that appear in other state reports.

Vacancies

2020 PA 316 outlines four requirements regarding the content to be included in each annual comprehensive teacher shortage report. First, the report must include:

> *The number of educator vacancies in this state, disaggregated by geographic region and by any broad subject areas and educational settings required for those vacancies.*

As we discussed earlier, we do not believe that the vacant positions that districts report in the REP accurately reflect the number of vacancies in the state. We still present data on district-reported vacancies to highlight changes over time and discrepancies between data sources, but we supplement these data with several other related metrics to provide a more robust (yet still incomplete) picture of teacher shortages in Michigan.

Filled and Vacant Teaching Positions and Full-Time Equivalencies

First, we summarize the number of teaching positions and full-time equivalences (FTEs) each year within categories based on the funded position statuses that districts reported in the REP. Specifically, we categorize all teaching positions into the following groups:

- ***Permanently filled***: The position is filled by a permanently assigned employee.
- ***Temporary vacancy – temporarily filled***: The position is temporarily assigned to a substitute, temporary employee, or outside contractor while the permanent employee who is normally assigned to the position is on leave or on loan.

- ***Temporary vacancy – unfilled***: The position is normally assigned to a permanent employee who is on leave or on loan and no one has been assigned to fill their position until they return.
- ***Permanent vacancy – temporarily filled:*** The position has been posted but has not been filled and a substitute, temporary employee, or outside contractor is assigned to fill it on a temporary basis.
- ***Permanent vacancy – unfilled:*** The position has been posted but has not been filled and no one is assigned to fill it on a temporary basis.

We consider each district-specific employment record associated with one or more teaching assignments to constitute a separate "teaching position." An individual person can have only one teaching position in any given district at one time but may have teaching positions in multiple districts at the same time. In addition to the total number of teaching positions each year, we calculate the total teaching FTEs, which are weighted proportionally to the FTE for each teaching assignment. If most teachers work full-time and teach in only one district, the FTEs and total teaching positions will be about the same, while there may be discrepancies between the FTEs and total teaching positions if there are a lot of part-time teaching positions or people teaching in more than one district at the same time.

Multi-Site and Third-Party Virtual Teachers

In some cases, strategies that districts use to fill vacant teaching positions during a shortage may result in changes in the *types of teachers* they employ more so than the *number of teachers*. For example, a district may rely more on teachers whose assignments are split between multiple schools or districts as opposed to teachers who are dedicated to a single building. A district may employ teachers through a third-party virtual course provider to fill vacancies or expand their course offerings.

To capture these types of changes, we also examine trends in the number of teachers working in multiple schools or districts, the average number of schools or districts where these teachers work, teachers with employment or assignment records associated with Michigan Virtual University, and teachers who are reported as the "teacher of record" for a course that's associated with a common third-party virtual course provider like Michigan Virtual University.[1]

Teachers With Temporary Credentials

Increases in the number of teachers with temporary credentials could (but does not always) signify that a district was unable to hire enough teachers who are fully certified and endorsed for the content they're teaching. To capture trends in teachers with these types of credentials, we calculate the total number of *unique educators* each year who both hold a temporary credential (i.e., a full-year substitute teaching permit, extended daily substitute teaching permit, annual career authorization, or special education approval) and are actively employed with a teaching assignment. These counts, by definition, are lower than the counts of *temporary credentials issued* in the

Office of Educator Excellence's annual Educator Workforce Reports, as the same person can be issued more than one credential. We do not include daily substitute teaching permits in these counts (however, as noted above, we do include *extended* daily substitute teaching permits, which allow an educator to cover a teaching assignment for a longer period than a daily substitute teaching permit).

Teachers Assigned Out-of-Field

We categorize all permanently or temporarily filled teaching assignments based on the credentials of the employee filling the assignment. Specifically, we consider whether the employee has a teaching certificate or a temporary teaching credential, and whether they have an appropriate endorsement for their assignment. We then calculate the appropriate placement rate as the total FTE across assignments filled by an appropriately placed teacher divided by the total FTE across all filled teaching assignments (i.e., all teaching assignments except unfilled vacancies). We also calculate appropriate placement rates among "teachers of record" for certain types of courses in the TSDL; we calculate these rates as a percentage of all "teachers of record" associated with a particular type of course (e.g., elementary self-contained, high school math). We identify appropriate combinations of endorsement codes and assignment codes or subject course codes using the same definitions that CEPI and MDE developed and used for their reports.

Retention Rates

The next requirement focuses on teacher retention. Specifically, the report must include:

> *The educator retention rates in this state, disaggregated by geographic region, broad subject areas and educational settings, number of years in the profession, and educator demographics.*

Mobility In and Out of the Teaching Profession

We compare fall-to-fall changes in educators' employment within the state public school system to identify individuals entering or exiting the teaching profession each year. We define educators "entering the teaching profession" as those with teaching positions in the fall of a given year who were not teaching the prior fall. We define educators "exiting the teaching profession" as those who are not teaching in the public school system in the fall of a given year but were in a teaching position the prior fall. Because these definitions are based only on two consecutive years, some "enterers" may have worked as teachers in earlier years, and some identified as "exiting" may have returned to teach in a later year. Similarly, support staff and other personnel who transition to a teaching role are considered "enterers" under this definition, while teachers who transition to other roles (e.g., teachers who become administrators) are classified as having exited the profession. We separately examine trends in the

number of first-year teachers, which we define as teachers who were never observed with a public school teaching assignment in Michigan in any previous collection.

Within- and Between-District Transfers

We define a within-district transfer as a change in an individual's assignment as a teacher working in a single building one fall to a teaching assignment in a different, single building in the same district the next fall. Some within-district transfers are initiated by the teacher (e.g., if there is an open position in a different building that the teacher would prefer to their current position) while others are initiated by the district (e.g., if a district needs to move some of its current employees to meet staffing needs in certain schools). Sometimes within-district transfers can be indicative of staffing challenges or teacher shortages, but this is not always the case.

Similarly, we define a between-district transfer as a change in an individual's assignment as a teacher working in a single district one fall to a teaching assignment in a different, single district the next fall. Although these teachers remain in the profession after the transfer, this type of mobility can exacerbate existing shortages as teachers tend to move from less advantaged to more advantaged districts.

Teaching Certificate Renewal/Progression

As another indicator for teachers' choices to remain in the profession, we examine the rates with which certified teachers maintain their certification by renewing their certificates or progressing to more advanced types of certificates. We use the term "recertification" to encompass all teachers who either renew or progress their certificates upon expiration. We calculate the recertification rate as the number of unique educators with expiring teaching certificates who renew or progress to a more advanced teaching certificate no later than one year after their certificate expired, divided by the total number of unique educators with expiring teaching certificates.

Teacher Preparation

The third requirement pertains to teacher candidates completing postsecondary teacher preparation programs. The report must include:

> *The number of graduates from approved, in-state teacher preparation programs, disaggregated by the broad subject areas and educational settings of those graduates, if any.*

In our initial report, we showed trends in postsecondary teacher preparation program enrollment and completion from Title II reports, as well as trends in new teaching certificates issued each year in Michigan. The Title II data in last year's report remain the most recent data available. The next wave of Title II data will be released publicly in the spring of 2023. However, we've updated the initial certification trends with new state data and added new analyses to provide more insight about where recent graduates from Michigan's teacher preparation programs are teaching.

Teachers Issued an Initial Certificate

We consider the first standard, standard Career and Technical Education (CTE), interim, or temporary teaching certificate (a certificate issued to out-of-state teacher candidates who already met most requirements for a Michigan certificate; previously named "temporary teacher employment authorization") an individual receives to be their "initial certificate." Our counts capture all initial certificates with issue dates falling between September 1st of the fall calendar year and August 31st of the spring calendar year of a given school year. We calculate these as counts of *unique educators* issued an initial teaching certificate; these are lower than counts of *all initial teaching certificates* issued because some educators received more than one initial teaching certificate at the same time (e.g., both a standard teaching certificate and a standard CTE certificate).

First Teaching Jobs for In-State Preparation Program Graduates

To understand where these newly certified teachers are going, we also identify the locations of graduates' first teaching jobs for those who graduated from an approved in-state teacher preparation program and taught in a Michigan TPS or charter school as a first-year teacher in 2021-22. We examine differences in the areas where graduates from different preparation programs tend to teach. We also calculate the average distance between the postsecondary institutions from which a teacher graduated and the location of their first teaching job.

Regional Analysis

The final requirement focuses on geographic variation in the type and extent of teacher shortages across the state. Specifically, the report must include:

> *An analysis of the regions in this state that present the highest need for educators based on educator shortages in those regions, disaggregated by the broad subject areas and educational settings of the positions in which there are shortages in those regions.*

Local Variation in Individual Report Metrics

In addition to the statewide trends we calculate for each of the vacancy, retention, and teacher preparation metrics described earlier, we calculate each metric at the local district level and generate heat maps to show local variation in each measure in the most recent school year. For each point on the map, we calculate the average value of each metric for the traditional public school district within whose boundaries the point is located, any charter schools located within that same district's boundaries, and close neighboring districts. This means that the values depicted on these maps represent the average value of a particular metric for a specific *location*, rather than for a specific *district*. We also generate subject-specific maps using variations of each metric that we calculated based on just teachers of a particular broad subject area or student population. We focus on core academic subject areas and educational settings that are common in districts throughout the entire state: all subjects in an elementary self-

contained classroom, special education, English language arts (ELA), mathematics, social studies, science, the arts (which includes both visual art teachers and music teachers), and world language.

Regions of the State Exhibiting the Most Severe Shortages

None of the metrics we described in this section are perfect indicators for the presence or severity of teacher shortages. Thus, while the heat maps for each metric provide context and insight about specific types of staffing challenges and how they vary across the state, none of these metrics on their own can definitively determine which areas of the state are experiencing the most severe shortages. Rather, we consider which areas of the state consistently show evidence of shortages across multiple, imperfect indicators. In addition to comparing patterns across the maps for each individual indicator to identify commonalities, we also construct composite measures using sets of related indicators to estimate and visualize the overall extent of teacher shortages in each area of the state.

We use principal component analysis to combine several indicators of teacher shortages into a smaller number of composite measures that capture as much of the variation from each individual indicator as possible. Before creating each composite measure, we complete an iterative Cronbach's alpha analysis to ensure that all indicators capture information about the same underlying construct. If an indicator does not align sufficiently with the other teacher shortage indicators, we exclude it from the composite measure. As a result, the exact sets of indicators we use are slightly different for each composite teacher shortage measure, depending on the relationships between the indicators for a particular subject area or educational setting.

SUMMARY

Although there are several available data sources that can inform our understanding of Michigan's teacher shortage, there are many limitations to the data that make it difficult to measure and interpret trends in teacher vacancies, retention rates, and teacher preparation program completion. The recommendations we outlined in our previous report aim to improve the quality and usefulness of these data, however, many of these are long-term efforts that will take years and, in some cases, legislative action to implement. Considering the current strengths and weaknesses of the data about vacancies, retention, and teacher preparation in Michigan, we include multiple alternative measures whenever possible to offer a more nuanced assessment of teacher shortages.

Section Three: Vacancies

The analyses in this report build upon and provide updates to many of the baseline trends in our initial report. To the extent possible with the data available, this section addresses the first of the four required topics outlined in 2020 PA 316:

> *The number of educator vacancies in this state, disaggregated by geographic region and by any broad subject areas and educational settings required for those vacancies.*

However, the existing and available state data about teacher vacancies in Michigan are very limited. Districts *can* report vacant teaching positions in the REP but they are not required by law to do so, and as we showed in Section Two, few districts report any vacancies at all. Given that district-reported vacancy data are so limited, we also consider other metrics that are indirectly related to vacancies:

1. The degree to which Michigan districts rely on teachers who are shared across multiple schools or districts, including those who are contracted through third-party virtual course providers; and
2. Districts' reliance on teachers who are not appropriately credentialed for the content they teach.

While these are not direct or infallible measures of teaching vacancies, we may expect to see districts engaging in these types of staffing practices when they do not have enough teachers or teachers with certain specializations to meet the needs of their students. This section provides an overview of the trends we observe in these data related (directly or indirectly) to vacancies, along with discussion of the ways in which our analyses are limited by the type, coverage, and quality of data available.

DISTRICT-REPORTED TEACHING POSITIONS

In last year's report, we showed that the number of district-reported vacancies in 2020-21 was unrealistically low and likely did not reflect the true extent of statewide vacancies at that time. We also showed that the number of permanently filled teaching FTEs decreased between 2012-13 and 2020-21, but that student enrollment also decreased at about the same rate. The top panel of Table 3.1 extends these trends in district-reported filled and vacant teaching FTEs through the 2021-22 school year. For this year's report we've also added a second panel in Table 3.1 showing the total number of district-reported teaching *positions*, giving equal weight to full-time and part-time teaching positions.

Districts Reported More Teaching Vacancies in 2021-22 Than in Previous Years

District-reported vacant teaching FTEs increased by about 40% from 2020-21 to 2021-22. As we discussed in Section Two, we cannot determine how much of the increase in reported vacancies is due to greater difficulties filling open teaching positions and how much is due to improvements in vacancy reporting. The counts of vacant *positions* in the bottom panel of Table 3.1 are consistently higher than counts of vacant *FTEs* in the top panel, suggesting that, on average, districts reported these vacant positions in the REP with less than full-time teaching assignments. The number of vacant teaching positions increased by about 17% from 2020-21 to 2021-22—much smaller than the 40% increase in vacant FTEs. This suggests that the new vacancies reported in 2021-22 may consist of more full-time teaching assignments than the vacancies reported in earlier years. As we show later in this section, this pattern is likely driven by Michigan Virtual University (MVU, also referred to as Michigan Virtual), a non-profit organization that provides online courses to students across the state. School safety legislation requires districts to report MVU teachers in the REP, and districts typically report very low FTE for these teachers (often 0.01 FTE for each teaching assignment).

The Number of Permanently Filled Teaching Positions Also Increased, Mostly Driven by Michigan Virtual University

Although student enrollment decreased between 2020-21 and 2021-22 (as it has every year since 2012-13),[2] permanently filled teaching FTEs *increased* by about 2%. This may reflect districts' responses to increased funding available from state and federal COVID-19 relief and recovery resources in the 2021-22 school year. There was an even larger increase in permanently filled teaching positions (6%). This suggests that, on average, the new positions reported in 2021-22 were less than full-time. This is also likely driven by Michigan Virtual teachers with low-FTE assignments.

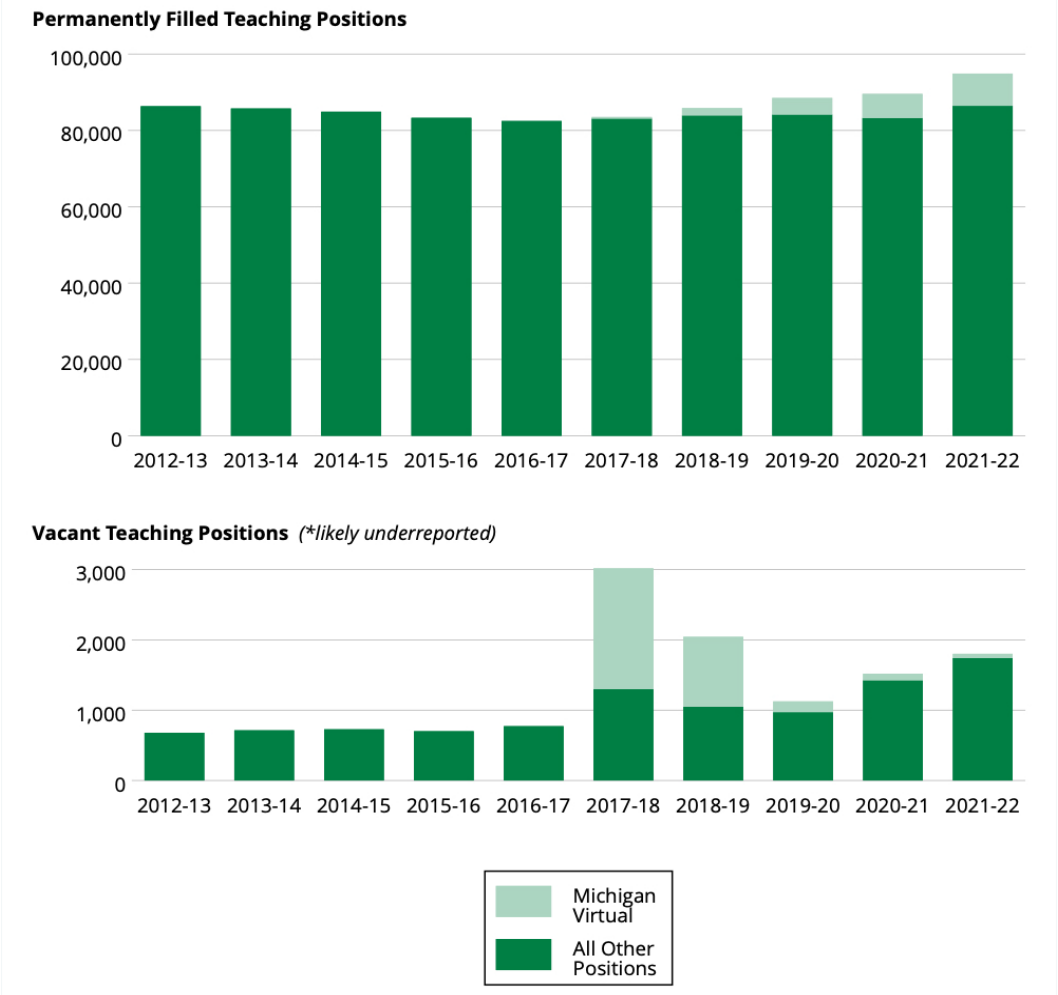
While year-to-year changes in teaching *FTEs* in earlier years generally decreased alongside student enrollment, the number of teaching *positions* has increased every year since 2016-17. Discrepancies between teaching FTEs and teaching positions are driven mostly by teachers who work in multiple districts at the same time whose FTE is therefore split between multiple teaching positions—including teachers that districts hire indirectly through contracted service providers like Michigan Virtual. Indeed, Figure 3.1 shows that MVU teachers have driven much of the increase in filled teaching positions.

Table 3.1. District-Reported Filled and Vacant Teaching Positions (Fall)										
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Total Teaching FTEs										
Permanently Filled	84,263	83,654	82,716	81,277	80,565	81,179	81,763	81,665	80,825	82,795
Vacant (*likely underreported)	498	558	590	541	598	1,020	801	599	875	1,228
Temporary Vacancy — Temporarily Filled	384	419	400	354	413	507	397	348	439	405
Temporary Vacancy — Unfilled	31	27	71	77	61	42	61	45	53	80
Permanent Vacancy — Temporarily Filled	59	76	82	82	87	441	286	117	244	347
Permanent Vacancy — Unfilled	24	36	37	28	37	30	57	89	139	396
Total Number of Teaching Positions										
Permanently Filled	86,344	85,747	84,892	83,301	82,470	83,521	85,845	88,492	89,566	94,891
Vacant (*likely underreported)	679	714	728	701	773	3,018	2,044	1,125	1,519	1,802
Temporary Vacancy — Temporarily Filled	536	557	520	482	552	765	655	568	744	724
Temporary Vacancy — Unfilled	34	28	73	84	71	47	66	49	55	83
Permanent Vacancy — Temporarily Filled	81	90	96	103	107	2,173	1,264	412	567	588
Permanent Vacancy — Unfilled	28	39	39	32	43	33	59	96	153	407

Note: FTE sums are rounded to the nearest whole number. Each combination of a person and district code is considered a "teaching position," e.g., if the same person works across two different districts, this counts as two teaching positions. "Permanently Filled" positions include those reported in the fall REP collection with funded position status code 9 ("Filled position, regular."). "Temporary Vacancies" include positions reported as "Funded, employee on loan or leave," while "Permanent Vacancies" include those reported as "Vacant, funded, open position." Vacancies are considered "Temporarily Filled" if they are reported with a funded position status code indicating that either a temporary employee or outside contractor is assigned to the position. Vacancies are considered "Unfilled" if they are reported with a funded position status code indicating that "no one is assigned to fill the position."

Under Section 21f of the State School Aid Act, students in districts across the state can enroll in MVU courses. This sometimes means that a single MVU teacher accounts for dozens of district-reported "teaching positions" in the same collection period. Figure 3.1 shows the total counts of filled teaching positions and vacant teaching positions, separately for Michigan Virtual (depicted in light green) and for all other teaching positions (depicted in dark green). The top panel of the figure shows that, excluding MVU, the number of permanently filled teaching positions has remained about the same over time, with a slight increase in 2021-22 relative to earlier years. The number of permanently filled MVU teaching positions, on the other hand, has increased each year since 2017-18.[3]

Figure 3.1. District-Reported Teaching Positions, Michigan Virtual Versus All Other Teaching Positions



Note: "Permanently Filled" positions include those with funded position status "Filled position, regular." "Vacant" positions include unfilled vacancies, temporarily filled vacancies, and positions that are temporarily unfilled or assigned to temporary employees while a permanent employee is on leave.

Although Table 3.1 showed a sudden increase in vacant teaching positions in 2017-18, the bottom panel of Figure 3.1 shows that the increase is mostly due to vacant MVU positions. Nearly all these MVU vacancies were reported in the REP as "permanent vacancies – temporarily filled," suggesting that districts utilized MVU teachers as a way to fulfill their staffing needs until they find a permanent teacher locally. While permanently filled MVU teaching positions increased year after year, vacant MVU positions decreased. This may suggest a shift towards relying on MVU teachers to expand course offerings permanently as opposed to a short-term solution in response to a vacancy. It is also possible that the increases in filled MVU positions and decreases in MVU vacancies are due to changes in reporting rather than changes in districts' use of MVU teachers.[4]

MULTI-SITE AND THIRD-PARTY VIRTUAL TEACHERS

Considering the effect of MVU teachers on trends in teaching positions and vacancies, we examine broader trends in multi-site and third-party virtual teachers to better understand shifts in districts' staffing practices and in the teaching profession.

Over the Past Five Years, Multi-Site and Third-Party Virtual Teachers Have Grown in Number and Expanded Their Reach

As Table 3.2 shows, the number of teachers teaching in more than one school[5] or district has increased substantially over time. The number of multi-district teachers has nearly doubled since 2017-18 and the number of teachers contracted through MVU has more than tripled. Third-party virtual course[6] teachers have increased by nearly 70%, peaking during the 2020-21 school year when more students than ever were learning remotely due to the COVID-19 pandemic. The number of teachers working in multiple schools in the same district has also increased, though to a lesser degree than multi-district and third-party virtual teachers.

On average, Michigan Virtual teachers work in far more districts than other types of multi-site teachers (e.g., teachers who travel between nearby districts to provide in-person instruction). In addition, the average number of districts in which multi-district teachers work has increased year after year. On average, multi-school teachers and teachers of record for third-party virtual courses also reached greater numbers of schools and districts, respectively, in 2021-22 compared to 2017-18.

While many of these changes accelerated during the COVID-19 pandemic, rates of multi-site and third-party virtual teachers began increasing years earlier. Policy changes that expanded Michigan students' access to digital learning options (2017 PA 143) likely contributed to this trend.

Table 3.2. Multi-Site and Third-Party Virtual Teachers by Year					
	2017-18	2018-19	2019-20	2020-21	2021-22
Multi-school teachers					
Number of teachers	6,265	6,562	6,668	7,265	7,196
Schools per teacher (average)	2.4	2.4	2.4	2.6	2.9
Multi-district teachers					
Number of teachers	710	820	889	1,067	1,367
Districts per teacher (average)	6.9	7.1	8.2	8.9	10.6
Michigan Virtual teachers					
Number of teachers	199	238	237	360	602
Districts per teacher (average)	25.1	26.4	33.7	32.0	27.6
Third-party virtual course teachers					
Number of teachers	1,227	1,298	1,457	2,235	2,075
Districts per teacher (average)	3.9	4.3	4.9	4.7	6.6

Note: "Multi-school" and "multi-district" teachers are individuals with REP teaching assignments in more than one school (in the same district) and more than one district, respectively. "Michigan Virtual teachers" are individuals with REP teaching assignments with the MVU building code. "Third-party virtual course teachers" are individuals reported as "teachers of record" for known courses from common third-party providers (including but not limited to MVU).

Multi-Site and Third-Party Virtual Teachers Are Most Prevalent in Rural Districts

Table 3.3 shows the prevalence of multi-school, multi-district, MVU, and third-party virtual course teachers in 2021-22, both overall and among various subgroups of teachers. For example, the first percentage in the "overall" row indicates that 6.1% of all teachers worked in multiple schools in the same district, and the first percentages in the "female" and "male" rows indicate that 5.2% of all female teachers and 8.7% of all male teachers worked in multiple schools in the same district. We include teachers who worked in both traditional public and charter schools in both the "TPS" and "PSA" percentages, and similarly, we include teachers who worked in more than one type of locale (e.g., both rural and suburban districts) in the percentages for every type of locale in which they worked. In some cases, the percentages for each type of school or locale are all greater than the "overall" percentage due to the large number of multi-site teachers who belong to more than one category.

As Table 3.3 shows, teachers in rural districts are more than twice as likely to work in multiple districts or be associated with a third-party virtual course provider, compared

to the population of Michigan teachers as a whole. Similarly, teachers in rural districts are about 25% more likely to work across multiple schools within the same district, compared to all Michigan teachers. While there is also a stark difference in the rates of multi-school and multi-district teachers by school type, this is mainly because most PSA districts consist of a single charter school.

Table 3.3. Multi-Site and Third-Party Virtual Teachers by Subgroup, 2021-22

	Percent of teachers who…			
	Work in multiple schools	Work in multiple districts	Have MVU teaching assignments	Teach third-party virtual courses
Overall	6.1%	1.5%	0.7%	2.3%
BY GENDER				
Female	5.2%	1.4%	0.7%	2.0%
Male	8.7%	1.8%	0.7%	3.4%
BY RACE/ETHNICITY				
White	6.3%	1.5%	0.7%	2.4%
Black	1.9%	1.4%	0.5%	1.2%
Latino	6.5%	2.2%	1.0%	2.6%
Asian	6.5%	2.5%	1.4%	2.6%
Other	5.0%	1.8%	0.6%	1.8%
BY YEARS IN PROFESSION				
0-4	5.4%	2.5%	1.0%	2.2%
5-9	5.8%	1.6%	0.6%	2.1%
10-14	5.9%	1.3%	0.5%	2.4%
15+	6.5%	1.1%	0.6%	2.4%
BY SCHOOL TYPE				
TPS	6.8%	1.6%	0.7%	2.4%
PSA	1.0%	6.0%	1.6%	2.6%
BY LOCALE				
Urban	4.1%	2.4%	1.0%	1.7%
Suburb/Town	6.3%	2.3%	0.9%	2.1%
Rural	7.7%	4.4%	1.8%	5.8%

Note: In some cases, percentages for all school types or locales are higher than the statewide percentage. This is because many multi-site and third-party virtual teachers work in both TPS and PSAs or in multiple locales and are therefore included in the calculations for multiple groups. The "other" race/ethnicity category includes teachers who are American Indian or Alaska Native, Native Hawaiian or Pacific Islander, or two or more races; we cannot show results for these races/ethnicities separately due to the low number of teachers in each group.

Multi-School Teachers Tend to Be Experienced, Veteran Teachers Whereas Multi-District Teachers Tend to Be Early in Their Careers

Table 3.3 shows that the percentage of teachers working in more than one school in the same district is highest among teachers with 15 or more years of prior experience teaching in Michigan traditional public or charter schools. The percentage of teachers working in multiple districts, on the other hand, is highest for teachers with the least amount of prior teaching experience (four or fewer years). This may suggest that multi-school teachers tend to serve different roles than multi-district teachers, perhaps as specialists, expert or master teachers, or teacher leaders. Multi-district teachers, on the other hand, tend to have relatively little prior teaching experience within the Michigan public school system. We cannot determine from the available data whether any of these teachers have out-of-state experience, which may be common among virtual teachers working with third-party providers that are not based in Michigan. Multi-school, multi-district, and third-party virtual course teachers are all more likely to be male than female, possibly because these types of teachers are more common at the secondary level than at the elementary level (as we show later in this section).

Art, Music, and World Language Teachers Frequently Travel Between Multiple Schools

Figures 3.2 through 3.4 show local variation in the use of multi-site and third-party virtual teachers overall and within several subject areas.[7] Figure 3.2 reveals that in most areas of the state, more than 5% of teachers in 2021-22 worked in multiple schools at the same time. However, this wasn't the case for all types of teachers. Throughout most of the state, more than 25% of teachers of "the arts" (which includes both visual art and music teachers) worked in multiple schools while very few elementary classroom teachers, if any, did so. There was a great deal of local variation in the prevalence of multi-school teachers in other subject areas, though these types of teaching positions were somewhat more common for world language teachers than for ELA, math, science, social studies, or special education teachers.

Multi-District and Third-Party Virtual Teachers Are Most Common in the Upper Peninsula and Northern Parts of the Lower Peninsula

Figure 3.3 shows that there are pockets across the state in which multi-district teachers are more heavily employed. To better represent the typical range of multi-district teacher rates in Michigan, which is much lower than the range of multi-school teacher rates, we use a different scale in Figure 3.3 than in Figure 3.2 (e.g., in Figure 3.2 the darkest shade of green represents rates above 25%, while in Figure 3.3 the same shade represents rates above 10%).

Multi-district teachers were most prevalent in parts of the Upper Peninsula (particularly in parts of Gogebic, Iron, Dickinson, Menominee, Delta, Mackinac, and Chippewa counties) and the northeastern part of the Lower Peninsula (throughout most of Alpena, Alcona, and Arenac counties as well as parts of several other counties in this region). A reference map of Michigan's counties and prosperity regions is available here.

While it was fairly uncommon for elementary or special education teachers to work in more than one district in 2021-22, this was quite common among other types of teachers in a few concentrated areas of the state.

Together, these data indicate that there are regions of the state—largely rural and remote—that are using multi-site and virtual teachers to augment their local teacher labor force. This could suggest that shortages that require multi-site or virtual teachers may be more severe in rural and remote regions. However, we cannot rule out the possibility that these patterns depict efficient uses of teacher resources when there is insufficient demand in a single school or district for a full-time teacher in some subject areas. Moreover, these kinds of teachers are less likely to teach elementary self-contained classes and special education and more likely to teach arts and world language courses, although third-party virtual teachers are also prevalent in ELA, math, science, and social studies across the state. This may be due to the nature of elementary and special education instruction, which may not lend as well to virtual instruction, as opposed to discrete secondary courses.

As Figure 3.4 shows, the percentages of all teachers who districts reported as "teachers of record" for known third-party virtual courses also tend to be highest in parts of the Upper Peninsula and northern Lower Peninsula. Very few elementary and special education teachers are associated with these types of virtual courses, and they are also less common for the arts than for ELA, math, science, social studies, and world language teachers.

Figure 3.2. Multi-School Teachers by Geographic Location and Subject Area

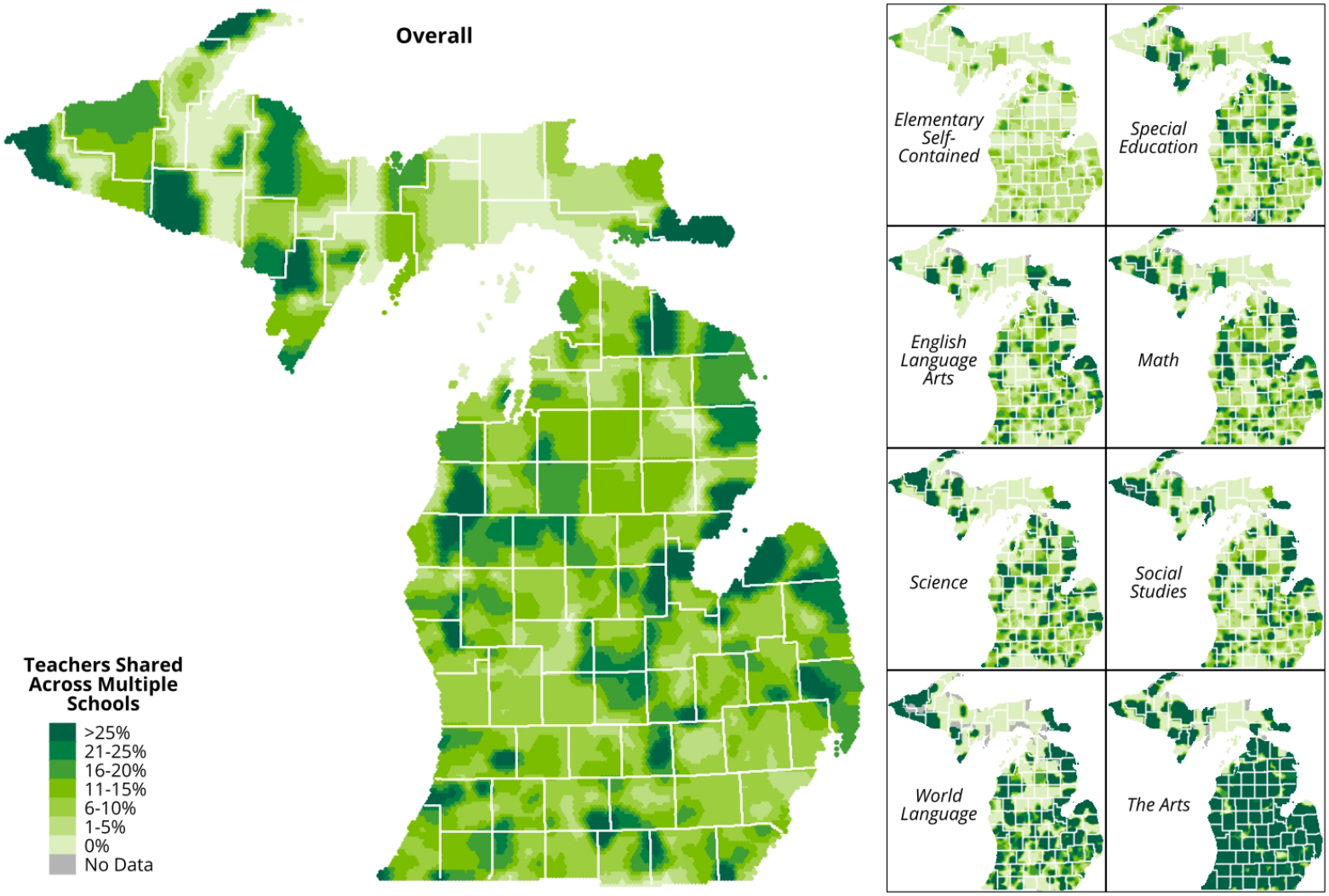


Figure 3.3. Multi-District Teachers by Geographic Location and Subject Area

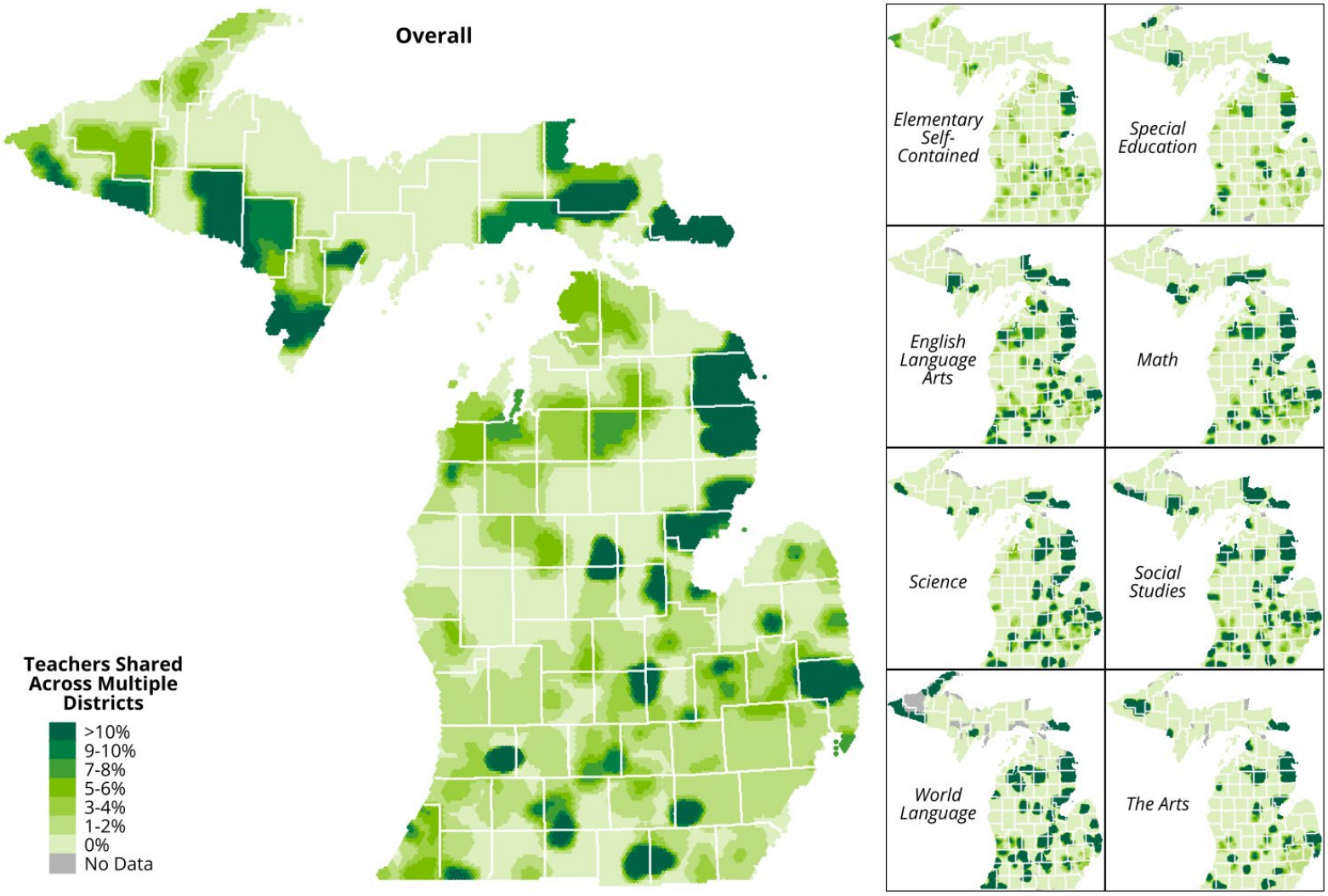
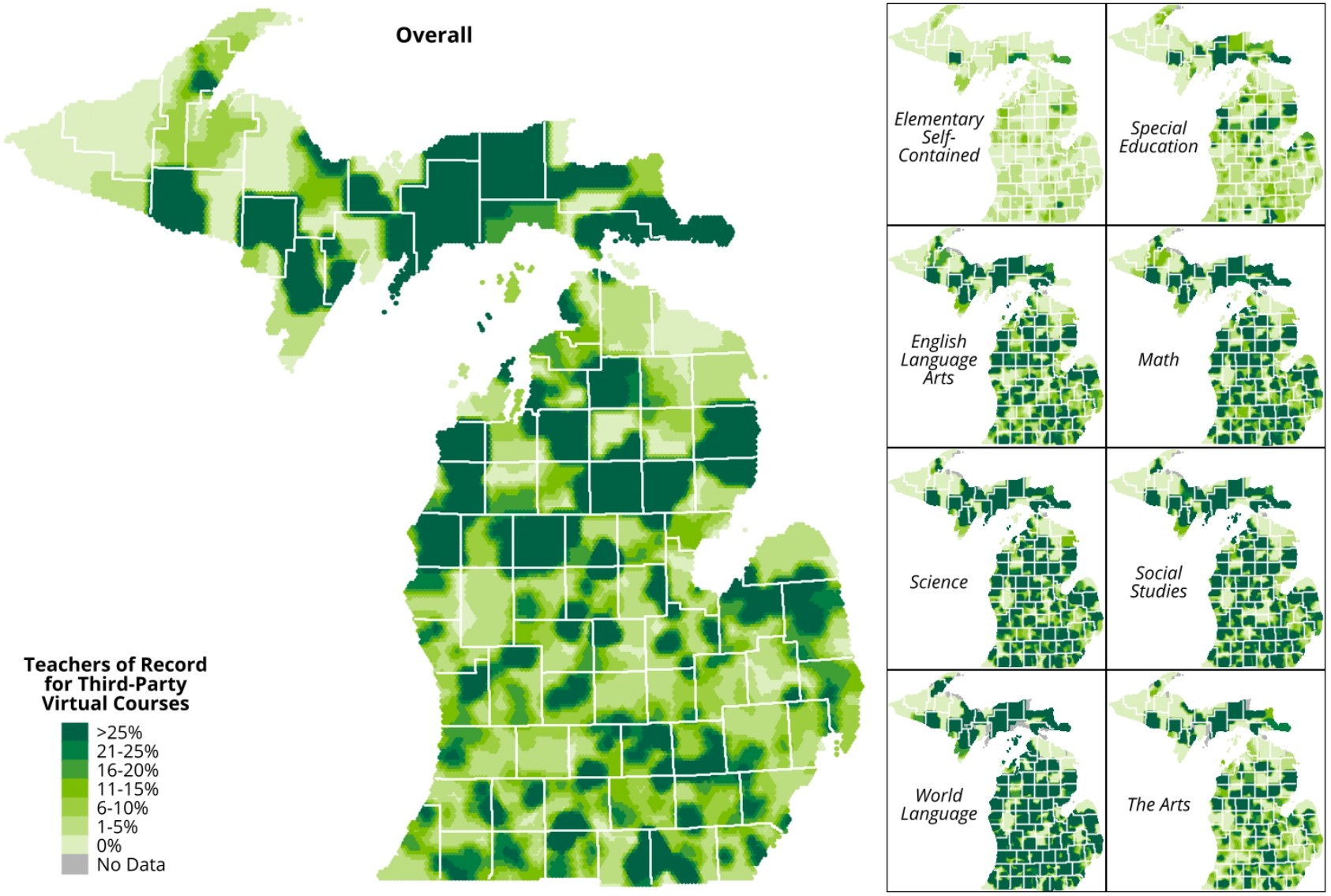


Figure 3.4. Third-Party Virtual Teachers by Geographic Location and Subject Area



TEMPORARY TEACHING CREDENTIALS AND APPROPRIATE PLACEMENT

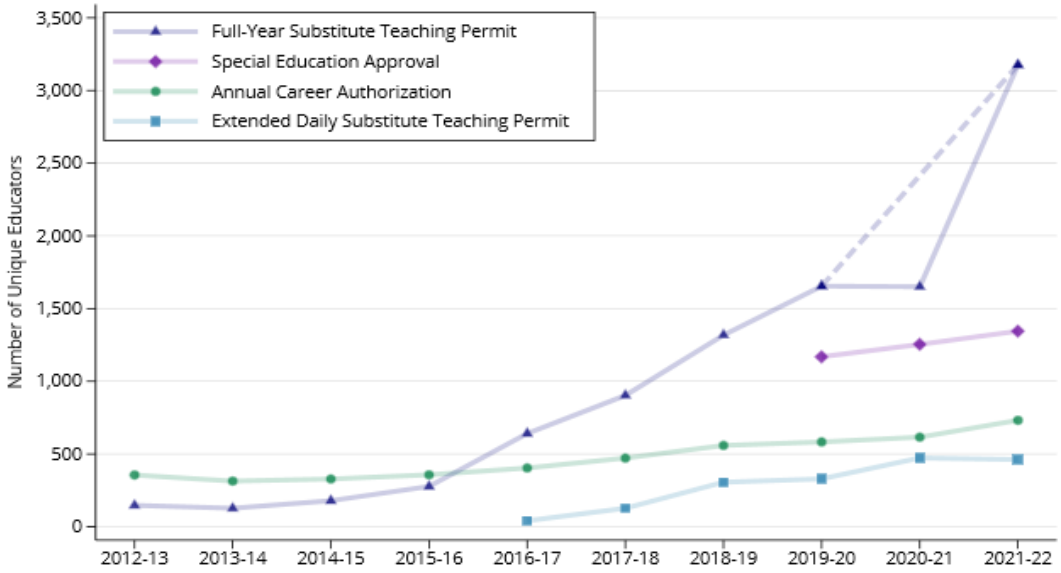
In the event of a shortage, some districts may apply for substitute teaching permits and other types of temporary teaching credentials to allow educators who do not have the necessary credentials to fill a teaching position. Districts can also use these permits as a way to recruit and train new teachers who are actively working toward a teaching credential (e.g., through a "grow-your-own" program). An increase in the number of educators with permits could in some cases signify a growing shortage, but in other cases may indicate that districts are successfully recruiting new teachers through these types of programs. By comparing educators' credentials to their teaching assignments, we can gain some insight into what these temporary credential trends might mean for students and classrooms.

The Number of Michigan Teachers With Temporary Credentials Continued to Increase

Our initial report showed that, after the permit system was restructured in 2016, the number of teachers with full-year substitute permits increased every year until 2019-20, then was stagnant from 2019-20 to 2020-21. As the blue triangles in Figure 3.5 show, the number of teachers with full-year permits increased again from 2020-21 to 2021-22, this time at a higher rate than in past years. One factor that contributes to this increase is a new requirement for virtual teachers to have full-year permits, even if they are already certified and endorsed in the subjects they are teaching (taking effect in 2021-22); however, the trend does not change substantially if we exclude that group of teachers, thus the increase in full-year substitute teaching permits over time cannot be solely or even largely attributed to this policy change.

The dashed line in the figure shows the change from 2019-20 to 2021-22. The slope of this line is much closer to the year-to-year changes in earlier years, though still slightly steeper. This suggests that the increase in 2021-22 resembles a return to the pre-existing increasing trend and that the stagnant rate in 2020-21 was an outlier, most likely related to the COVID-19 pandemic. As the other three lines in Figure 3.5 show, special education approvals, annual career authorizations, and extended daily substitute teaching permits also increased in 2021-22, but these increases were generally consistent with trends in earlier years.

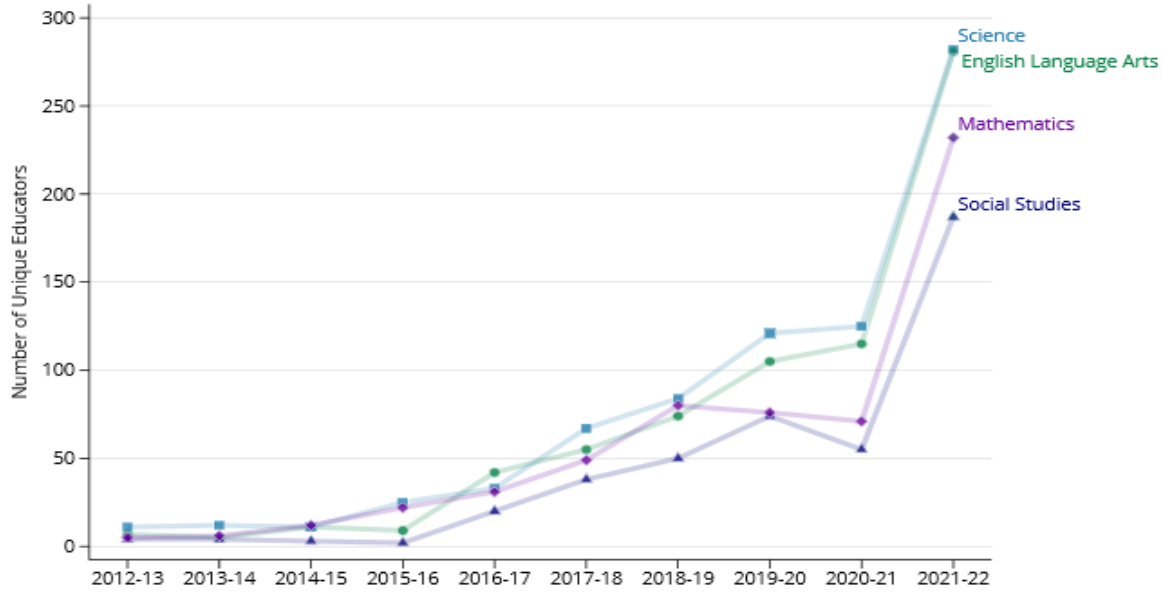
Figure 3.5. Individuals With Temporary Teaching Credentials



Note: All data points represent counts of unique educators with a particular type of credential who were actively employed with teaching assignments.

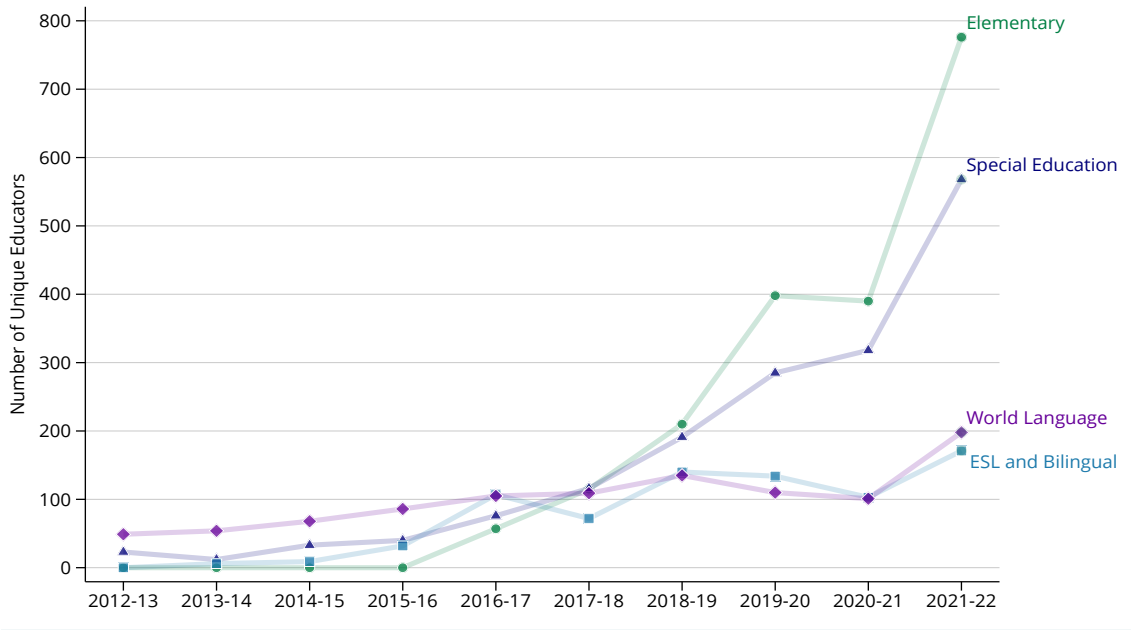
Figures 3.6 and 3.7 show trends in full-year substitute teaching permits separately for different subject areas and educational settings. The trends for each subject or setting follow very similar patterns to the overall trend in Figure 3.5, with stagnant rates between 2019-20 and 2020-21 followed by sharp increases between 2020-21 and 2021-22.

Figure 3.6. Educators With Full-Year Substitute Teaching Permits by Core Subject Area



Note: Each line represents the number of unique, actively employed educators with full-year substitute teaching permits in a certain subject area.

Figure 3.7. Educators With Full-Year Substitute Teaching Permits by Subject Area or Educational Setting



Note: Each line represents the number of unique, actively employed educators with full-year substitute teaching permits in a certain subject area.

Together, these data suggest that reliance on educators with temporary teaching credentials has steadily increased over time. While this may reflect difficulties stemming from a shortage of fully credentialed teachers, as we note above, districts may also be using this pathway to recruit early-career teachers into their local workforce.

There Were More Certified Teachers Assigned Out-of-Field Than Non-Certified Teachers With Substitute Permits

Table 3.4 shows the percentages of Michigan teachers who are certified, who do or do not have an appropriate endorsement for the content they are teaching, and who are not certified but have a full-year substitute permit or other temporary credential. The top panel shows these as percentages of the total teaching FTE that districts reported in the REP and the bottom panel shows them as percentages of the "teachers of record" that districts reported for each course in the TSDL. We calculate both sets of percentages for elementary classroom teachers who teach all core subjects and for math, ELA, science, and social studies teachers at the secondary level.

Table 3.4. Percent of Teachers Appropriately Credentialed for Their Assignments/Courses, 2021-22					
Percent of Teaching FTEs	Elementary	Math	ELA	Science	Social Studies
Certified Teachers	97.0%	98.0%	97.9%	97.4%	98.8%
Appropriately Endorsed	96.5%	95.1%	93.1%	90.5%	96.5%
Not Appropriately Endorsed	0.5%	2.9%	4.8%	6.9%	2.3%
Full-Year Substitutes	2.9%	1.7%	2.1%	2.5%	1.2%
No Credential Found	0.1%	0.2%	0.1%	0.1%	0.1%
Percent of Teachers of Record					
Certified Teachers	94.3%	95.9%	95.9%	94.5%	96.6%
Appropriately Endorsed	93.4%	90.9%	91.4%	84.4%	92.5%
Not Appropriately Endorsed	0.8%	4.9%	4.6%	10.1%	4.1%
Full-Year Substitutes	5.2%	3.5%	3.4%	4.9%	2.9%
No Credential Found	0.6%	0.7%	0.7%	0.7%	0.5%

Note: Some teachers in the "no credential found" category have daily substitute teaching permits, and some may have credentials that are tied to a different ID number than their employment data.

The percentages of teachers who are certified and the percentages who are appropriately endorsed are consistently higher when we calculate these based on teachers' assignments in the REP than when we calculate them based on the courses for which they're listed as a "teacher of record" in the TSDL. Some reporting practices that may contribute to this pattern include districts using non-teacher assignment codes for individuals who are not certified teachers but are acting as teachers of record, districts choosing assignment codes that align with a teacher's endorsement areas rather than the content of the courses they teach, and districts reporting some individuals as "teachers of record" in the TSDL who were not actually acting in that role (e.g., a facilitator for a virtual course who was not the same person who was responsible for providing instruction for that course or a substitute teacher who only covered the course for a short period of time).

Across the State, Science Teachers Are the Least Likely to Be Appropriately Credentialed for the Courses They Teach

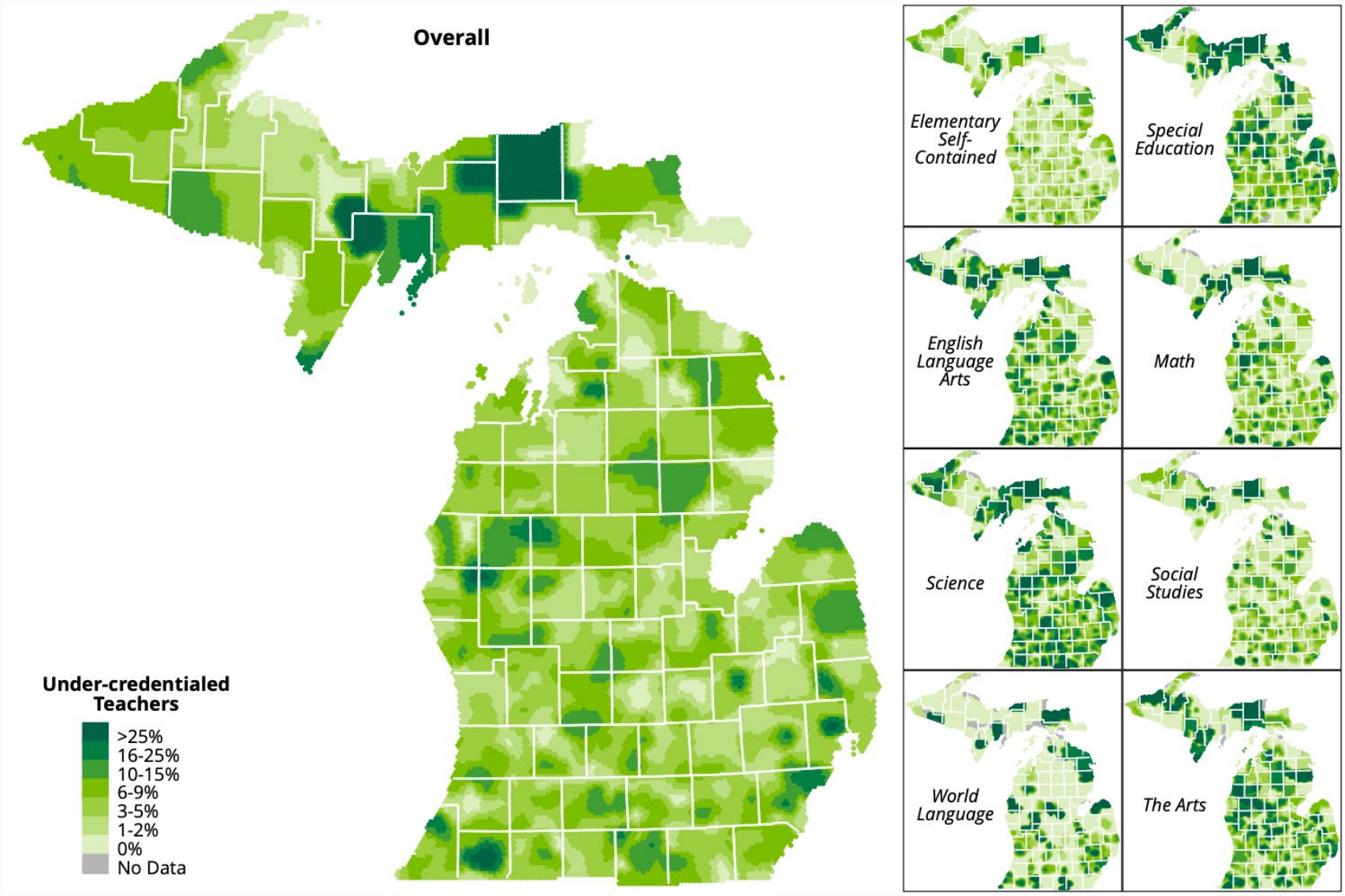
The percentages of teachers who are certified but not appropriately endorsed are much higher for science than for other core subjects. This may be because science endorsements are more specialized than math endorsements (e.g., there is a single "Mathematics" endorsement that qualifies a teacher to teach all math classes but

there are separate endorsements for biology, chemistry, physics, earth/space science, and physical science).

Figure 3.8 shows the percentage of "under-credentialed" teachers, which includes teachers who are not certified as well as teachers who are certified but do not have an appropriate endorsement for their teaching assignment(s) in the REP. Overall, fewer than 10% of teachers are under-credentialed in most regions of the state, with some rare exceptions again in the Upper Peninsula and a few more rural and remote areas. However, in many areas of the state, more than 25% of science teachers are under-credentialed. This is typically because they do not have the appropriate endorsement and not because they are not certified teachers.

In some areas, there are also high rates of under-credentialed ELA and special education teachers. Most of the under-credentialed ELA teachers are elementary-certified teachers working as reading specialists, while most of the under-credentialed special education teachers are certified teachers with a Special Education Personnel Approval.

Figure 3.8. Under-Credentialed Teachers by Geographic Location and Subject Area



SUMMARY

Although districts reported more teaching vacancies in 2021-22 than in previous years, it is clear that the data reported in the REP do not provide a complete picture of vacancies in Michigan. However, changes in the number and types of positions that districts report in the REP each year highlight some ways that districts may be responding to local vacancies. Districts' increasing use of shared teachers, third-party virtual course providers, and temporary teaching credentials may be signs of worsening local and statewide shortages.

Section Four: Retention

In addition to recruiting enough teachers to meet their staffing needs, *retaining* teachers is critical for districts to be able to provide their students with access to high-quality instruction in a stable learning environment. In this section, we examine several aspects of teacher retention including mobility, attrition, and maintenance of teaching credentials. These analyses address the second report requirement outlined in 2020 PA 316:

> *The educator retention rates in this state, disaggregated by geographic region, broad subject areas and educational settings, number of years in the profession, and educator demographics.*

In addition to updating the rates and trends from EPIC's initial report, we include additional subgroup breakdowns and geographic analyses to deepen our understanding of how and where teacher retention varies throughout the state of Michigan.

MOBILITY AND ATTRITION

Mobility and attrition both contribute to teacher turnover but have different causes and may require different policy solutions (Grissom, Viano, & Selin, 2016). To better understand the nature and possible causes of teacher turnover in Michigan both at the state and local levels, we examine:

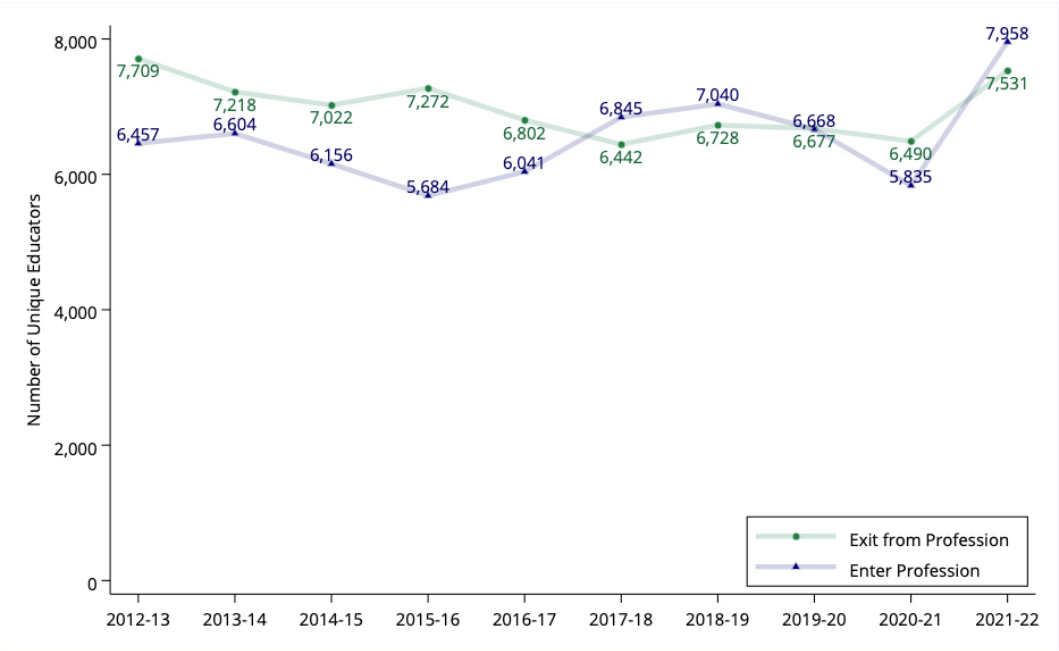
- Rates of entry into and exit from the teaching profession;
- Mobility of teachers between schools and districts; and
- The share of teachers each year who are inexperienced or new to their current districts.

Rates of Entry Into and Exit From the Teaching Profession Decreased Early in the COVID-19 Pandemic and Then Increased Drastically in 2021-22

In last year's report, we showed that there were more teachers exiting the profession than entering each year until 2017-18 when this trend reversed. During the COVID-19 pandemic, the rate of teacher exits did not change much but the number of new teachers entering the profession decreased substantially, once again resulting in a greater number of exiters than enterers. Figure 4.1 shows that between 2020-21 and

2021-22, both the number of teachers entering the profession and the number exiting increased drastically, with enterers ultimately outnumbering exiters. One possible explanation for the increase in new teachers entering the profession is that some newly certified teachers who completed their teacher preparation programs just before or early in the COVID-19 pandemic may have delayed starting their first teaching jobs until after most districts resumed in-person instruction in 2021-22. It is also possible that some teachers who temporarily left early in the COVID-19 pandemic then returned to teaching in 2021-22 are contributing to this increase. The increase in exits, on the other hand, may be the result of increased stress and burnout during the COVID-19 pandemic.

Figure 4.1. Entry Into and Exits From the Teaching Profession (Fall-to-Fall)



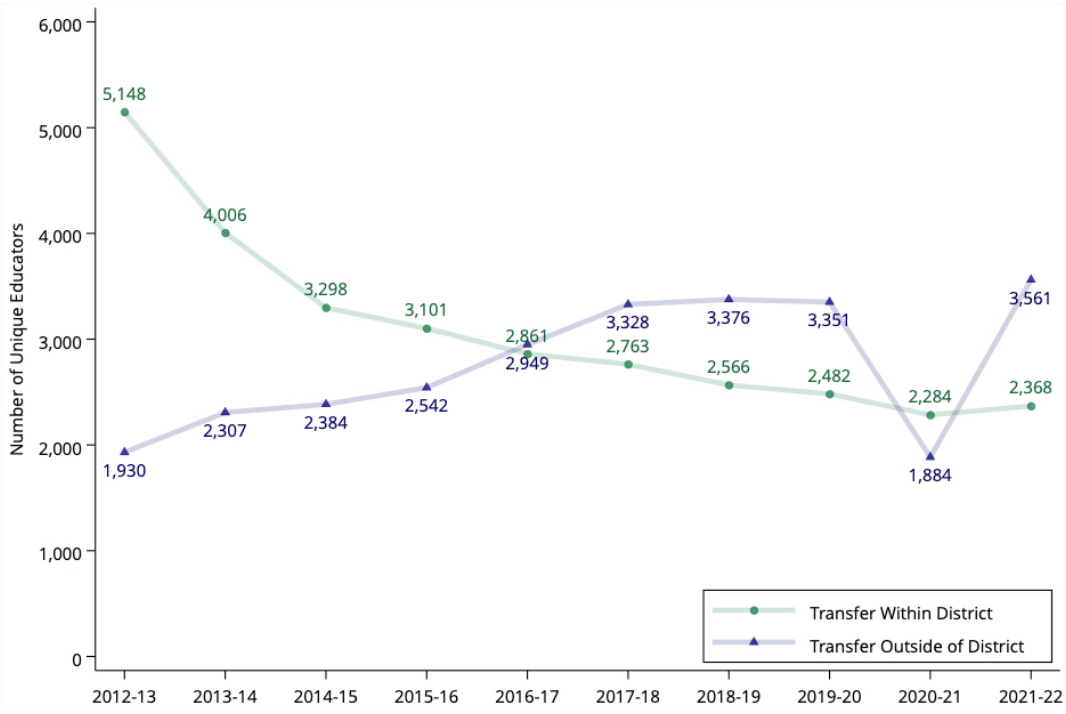
Note: "Enterers" may include some teachers who reentered the profession or switched from a non-teaching role within the state public school system to a teaching role. Exit rates may include some educators who left temporarily and returned to teach in a later year and some who switched from teaching to non-teaching roles within the state public school system.

Mobility Between Districts Dropped to a New Low in 2020-21 Then Jumped to an All-Time High in 2021-22

Last year's report showed that the number of teachers transferring to other districts increased for several years before sharply declining in 2020-21. Using a new year of data, we now find a sharp *increase* in teachers moving between districts in 2021-22, shown in Figure 4.2. This new peak surpasses the rate of between-district transfers before the COVID-19 pandemic.

Figure 4.2 shows that, after consistently decreasing every year since 2012-13, there was a slight increase in the number of teachers who transferred to other schools within their district between 2020-21 and 2021-22. While within-district transfers don't always signify a teacher shortage, an uptick in this type of mobility could mean that districts are struggling to retain teachers and as a result are reassigning their teachers to different buildings to meet their staffing needs. On the other hand, these types of transfers can also occur after structural changes in a district, such as enrollment declines occurring in certain grade levels and schools, school buildings opening or closing, or changes in the grade levels or program offerings in a school building.

Figure 4.2. Teachers Transferring to Other Schools or Districts (Fall-to-Fall)



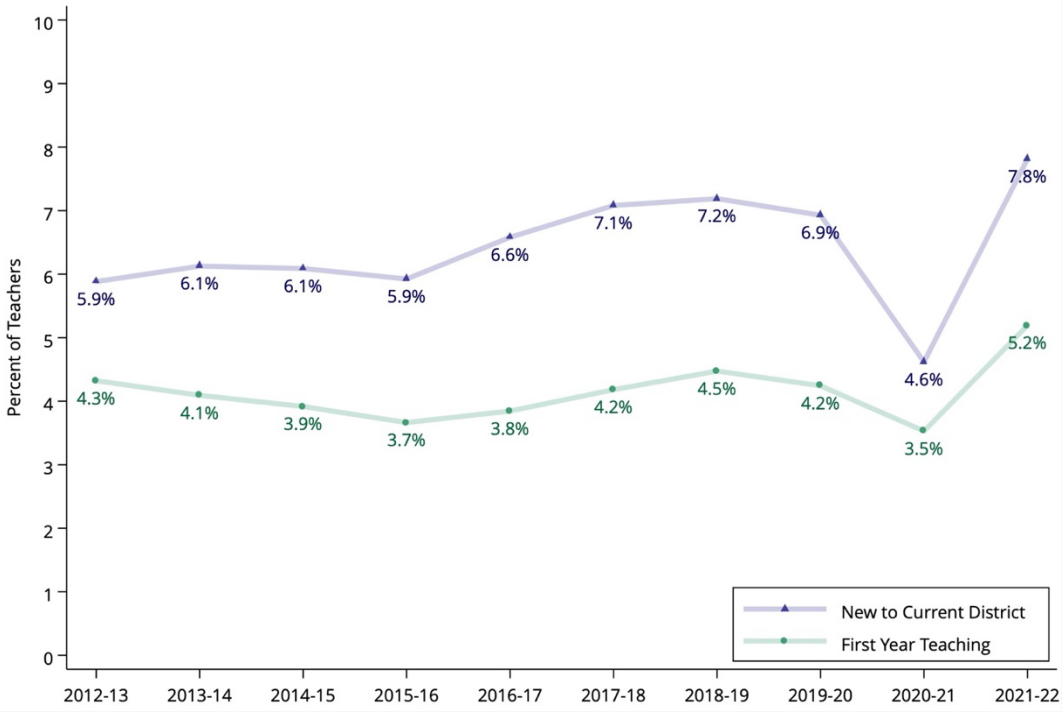
Note: We identify within-district transfers as a change in an individual's assignment from a teacher working in a single building one fall to a teaching assignment in a different, single building in the same district the next fall. Similarly, we identify between-district transfers as a change in an individual's assignment as a teacher working in a single district one fall to a teaching assignment in a different, single district the next fall.

Inexperienced Teachers and New Hires Made Up Larger Shares of the Teaching Workforce in 2021-22 Than Ever Before

Figure 4.3 shows trends in the percentage of teachers who were in their first year of teaching and the percentage who were new to their current district in the fall of each school year. Both percentages decreased to all-time lows in 2020-21 and then increased to all-time highs in 2021-22. As we noted about the rates of entry into the

teaching profession in Figure 4.1, these trends in first-year teachers may be driven in part by teachers who became certified to teach shortly before the 2020-21 school year but waited until 2021-22 to start teaching. The percentage of teachers who were new to their current district, which includes both newly certified teachers and teachers who transferred from other districts, both decreased between 2019-20 and 2020-21 and increased between 2020-21 and 2021-22 at even higher rates, suggesting that some teachers who otherwise may have switched districts in 2020-21 chose to wait until the next year to do so.

Figure 4.3. Percent of Teachers Who Are New to Their Current District or in Their First Year of Teaching



Note: Teachers who are "new to their current district" may include some teachers who previously taught in other districts. "First-year teachers" may include some teachers who previously worked in a non-teaching role in a traditional public or charter school in Michigan and some who taught in private schools or in other states.

VARIATION BY SUBGROUP AND LOCATION

While these trends provide context about the overall extent of mobility and attrition in Michigan over time, we also examine the degree to which recent mobility and attrition rates differ across demographic groups, experience levels, types of schools and locales, subject areas, and geographic locations. The analyses in this subsection help us to understand for whom and where mobility and attrition rates are highest, as well as how differential rates across subgroups may affect the distribution of

experienced, high-quality teachers throughout the state and the degree to which the teaching workforce is representative of the students they serve.

Mobility and Attrition Rates Were Highest for Teachers of Color, Teachers With Less Experience, and in Charter Schools

Table 4.1 provides the percentages of teachers who exited the profession, began their first year of teaching, began teaching in a new district, transferred within their district, or transferred to a different district between fall 2020 and fall 2021, overall and by gender, race/ethnicity, years in the profession, school type, and locale type.

Table 4.1. Mobility and Attrition by Subgroup, Fall 2020 to Fall 2021

	Percent of teachers who…				
	Exited from teaching	Were in their first year	Were new to their district	Transferred within their district	Transferred to another district
Overall	9.0%	5.2%	7.8%	2.8%	4.3%
BY GENDER					
Female	9.0%	5.2%	7.8%	3.0%	4.4%
Male	9.2%	5.1%	7.7%	2.2%	4.0%
BY RACE/ETHNICITY					
White	8.7%	4.8%	7.4%	2.8%	4.1%
Black	13.7%	8.9%	11.6%	4.1%	5.5%
Latino	10.6%	8.4%	9.5%	2.2%	3.8%
Asian	9.8%	9.9%	12.5%	3.1%	6.8%
Other	8.9%	10.0%	12.6%	2.3%	6.4%
BY YEARS IN PROFESSION					
0-4	11.8%	24.1%	22.9%	2.5%	7.1%
5-9	7.6%	n/a	6.3%	3.0%	6.9%
10-14	6.9%	n/a	4.9%	3.0%	4.8%
15+	8.9%	n/a	2.4%	2.9%	2.0%
BY SCHOOL TYPE					
TPS	8.3%	4.2%	6.7%	3.1%	4.1%
PSA	14.4%	13.5%	17.4%	0.4%	5.5%
BY LOCALE					
Urban	10.2%	6.2%	7.9%	3.1%	3.9%
Suburb/Town	8.5%	4.4%	6.9%	3.2%	4.1%
Rural	9.0%	6.1%	9.0%	1.4%	4.5%

Note: Each number in this table represents the percentage of Michigan teachers (overall or within the specific subgroup of teachers represented in each row) who exhibited a particular type of mobility, attrition, or entry into the profession. The "other" race/ethnicity category includes teachers

who are American Indian or Alaska Native, Native Hawaiian or Pacific Islander, or two or more races; we cannot show results for these races/ethnicities separately due to the low number of teachers in each group.

For example, the first percentage in the "overall" row indicates that 9.0% of all Michigan teachers in fall 2020 were no longer teaching in any traditional public or charter school in Michigan in fall 2021, while the first percentages in the "female" and "male" rows indicate that 9.0% of female teachers and 9.2% of male teachers in fall 2020 were no longer teaching within the state public school system in fall 2021. Black, Latino, and Asian teachers, as well as teachers of other non-White races/ethnicities, were all more likely than White teachers to exit the profession, more likely to be in their first year of teaching, and more likely to be new to their current district. Black teachers and Asian teachers were also more likely than White teachers to transfer between schools or districts, while Latino teachers were slightly less likely than White teachers to move within or between districts.

Teachers with four or fewer years of prior teaching experience were most likely to exit the profession, reflecting well-established national attrition patterns whereby teachers in their first five years of the profession are more likely to exit teaching (Gray & Taie, 2015; Hammerness, 2008; Cooper & Alvarado, 2006; Ingersol, 2003). In addition, teachers with less experience were more likely to transfer between districts, which may reflect more senior teachers' ties to their districts due to financial incentives built into salary schedules and pension plans (Struyven & Vanthournout, 2014; Quartz et al., 2008; Theobald & Gritz, 1996). All types of mobility and attrition were higher for teachers in charter schools than those in traditional public schools, except for within-district transfers, which is unsurprising given that most charter districts in Michigan have only one school.

Urban and Rural Districts Experienced Greater Teacher Turnover than Suburbs or Towns

Mobility and attrition rates were consistently higher in urban and rural areas than in suburbs or towns. Teachers in urban districts were the most likely to exit the profession, while teachers in rural areas transferred between districts at the highest rates. While about the same percentages of teachers in urban and rural districts were in their first year of teaching in fall 2021, more teachers in rural areas were new to their districts due to their higher rate of between-district mobility.

On Average, Overall Teacher Employment Levels Remained Relatively Stable in Most Regions

Figure 4.4 shows the percent change in the total number of teachers employed in each area of the state, both overall and by subject area, from fall 2020 to fall 2021. In most areas of the state, the total size of the teaching workforce changed by no more than

5% in either direction. The subject area maps reveal variation in the change in employed teachers across the state, with some regions and subjects experiencing quite substantial swings in net employment whereas other regions and subjects see relatively steady employment numbers.

Between-District Transfers Occurred at Comparable Rates Throughout Most of the State, While Within-District Transfers Were Contained to a Few Local Areas

Figures 4.5 and 4.6 show local rates of between-district and within-district transfers, respectively, across the state of Michigan. The overall between-district transfer rates in Figure 4.5 fall between 3% and 6% in most parts of the state, though the specific types of teachers who tend to transfer differ by region. As Figure 4.6 shows, within-district transfers occur less frequently in comparison, with exceptions for only a few distinct areas of the state that have much higher rates, possibly because of recent structural changes in districts in those areas.

In Many Parts of the State, There Were Very Few First-Year or Newly-Hired Teachers With Any Specialization Other Than Elementary Education

While very high percentages of new teachers may indicate that districts have substantial turnover and are struggling to retain experienced teachers, very low percentages may indicate that there are too few teachers available or willing to fill teaching vacancies. Figure 4.7 shows local proportions of first-year teachers throughout Michigan. Overall, between 4% and 9% of teachers in most parts of the state were in their first year of teaching, with only a few concentrated areas experiencing rates outside this range. However, the subject area maps reveal far more variation in local shares of new special education and subject-specific teachers. In most parts of the Upper Peninsula and some regions in the Lower Peninsula, there were no first-year special education, ELA, math, science, social studies, world language, or arts teachers at all and very high rates of first-year teachers in a few scattered areas. Figure 4.8 shows local rates of newly hired teachers, which include both first-year teachers and experienced teachers who transferred from other districts. While some parts of the state where there were no first-year subject-specific teachers indeed had some new hires with prior teaching experience, there are several areas (mostly in the Upper Peninsula and northern half of the Lower Peninsula) without any new hires at all.

Figure 4.4. Change in Total Number of Teachers by Geographic Location and Subject Area, Fall 2020 to Fall 2021

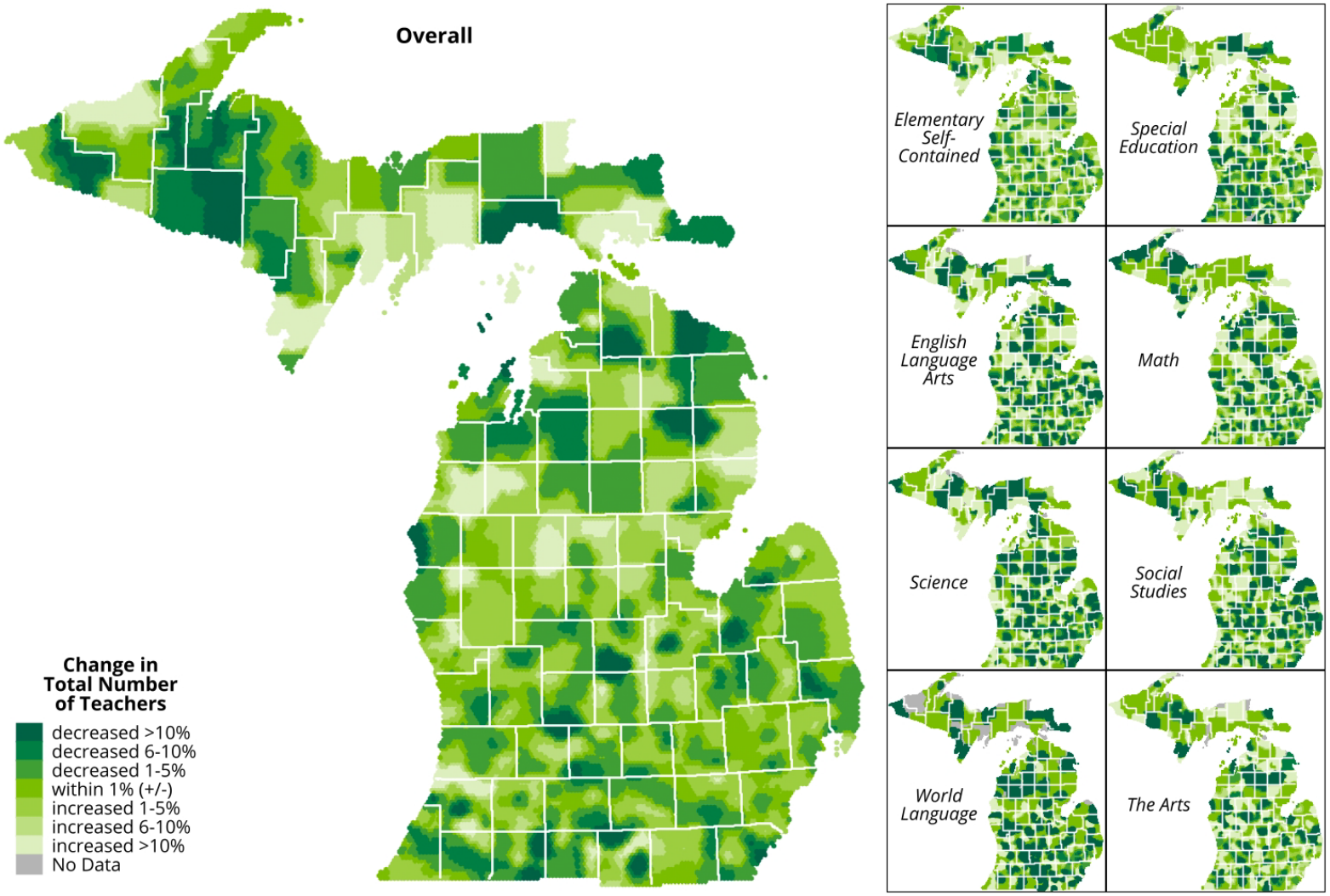


Figure 4.5. Between-District Transfer Rates by Geographic Location and Subject Area, Fall 2020 to Fall 2021

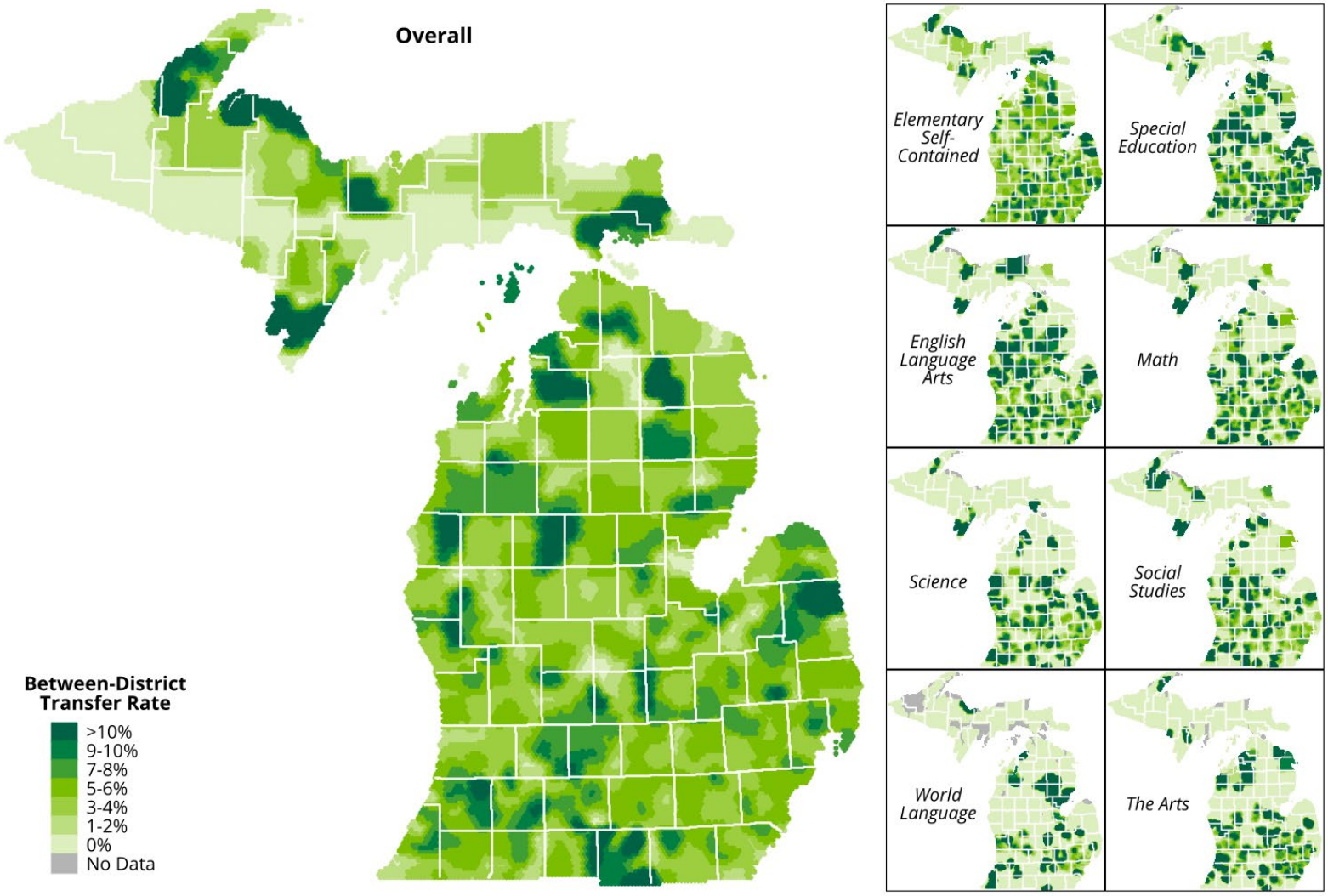


Figure 4.6. Within-District Transfer Rates by Geographic Location and Subject Area, Fall 2020 to Fall 2021

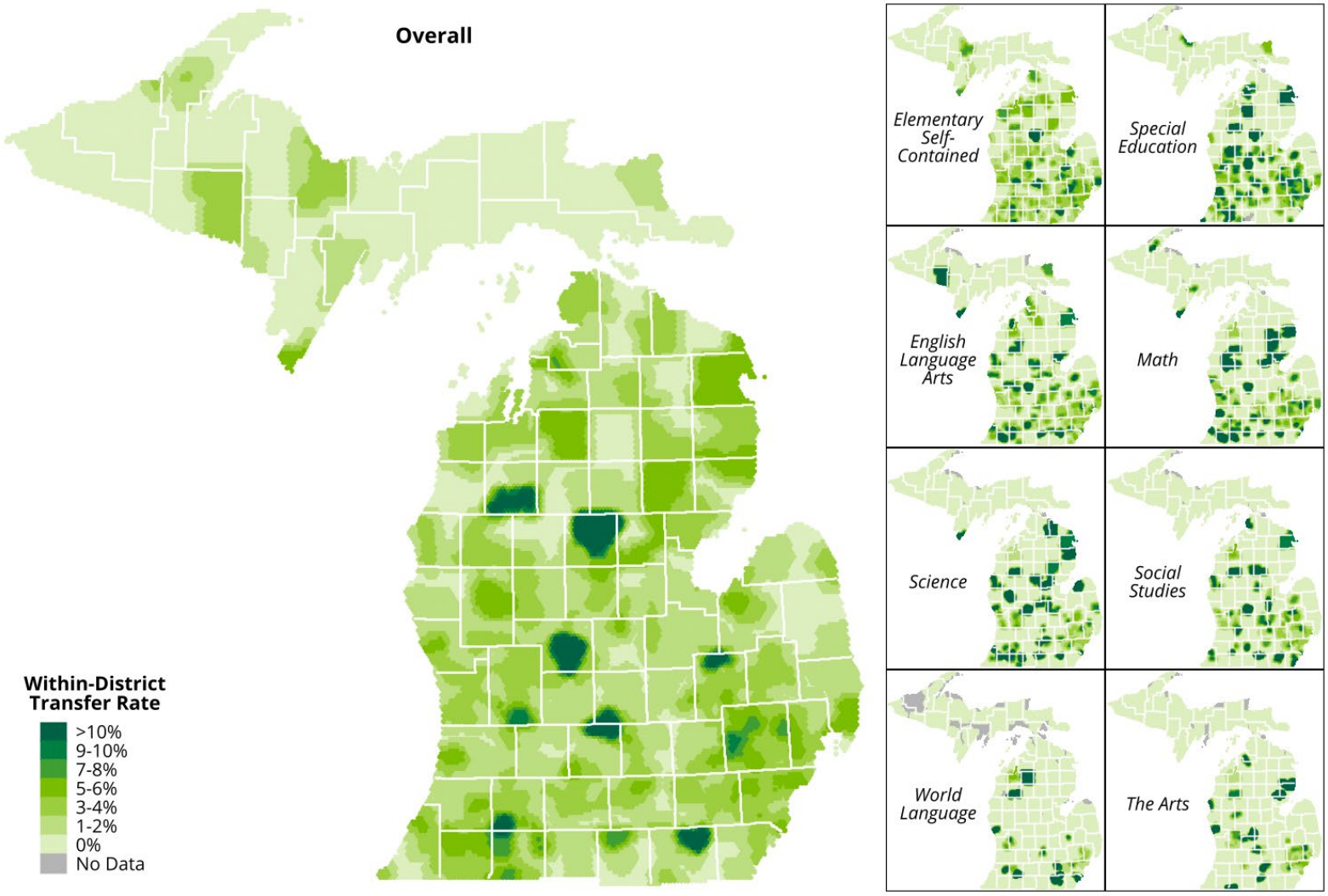


Figure 4.7. First-Year Teachers by Geographic Location and Subject Area, Fall 2021

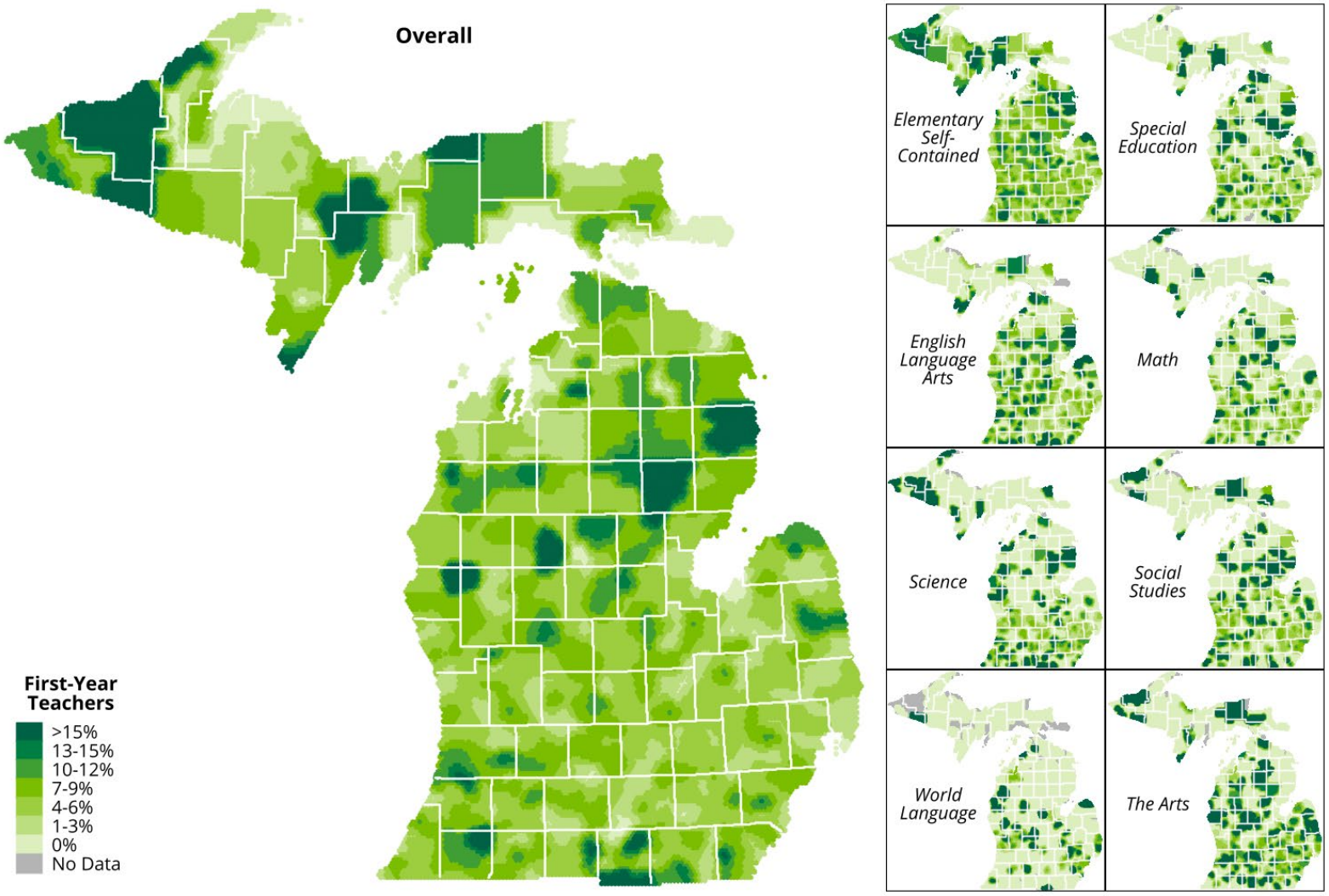
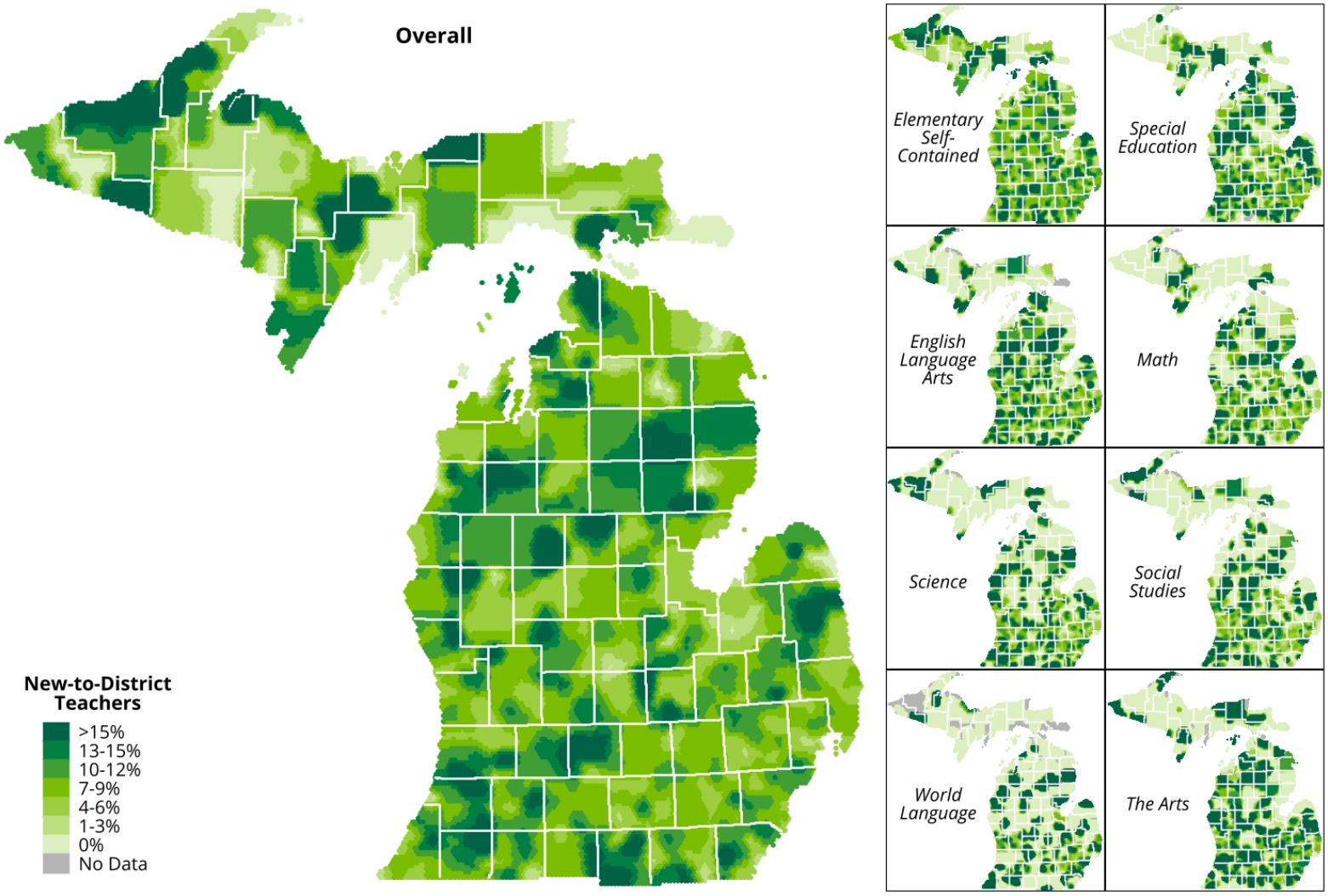


Figure 4.8. Teachers New to Their Current District by Geographic Location and Subject Area, Fall 2021



CERTIFICATION RENEWAL AND PROGRESSION

The final set of analyses in this section focuses on teachers' decisions to maintain their certification, either by renewing their teaching certificates or by progressing to more advanced types of teaching certificates. Throughout the section, we use the term "recertification" to encompass both renewal and progression of teaching certificates.

Actively Employed Teachers Were Far More Likely to Remain Certified After Their Initial Certificates Expired, Compared to Former Teachers and Certified Teachers Who Never Taught in Michigan

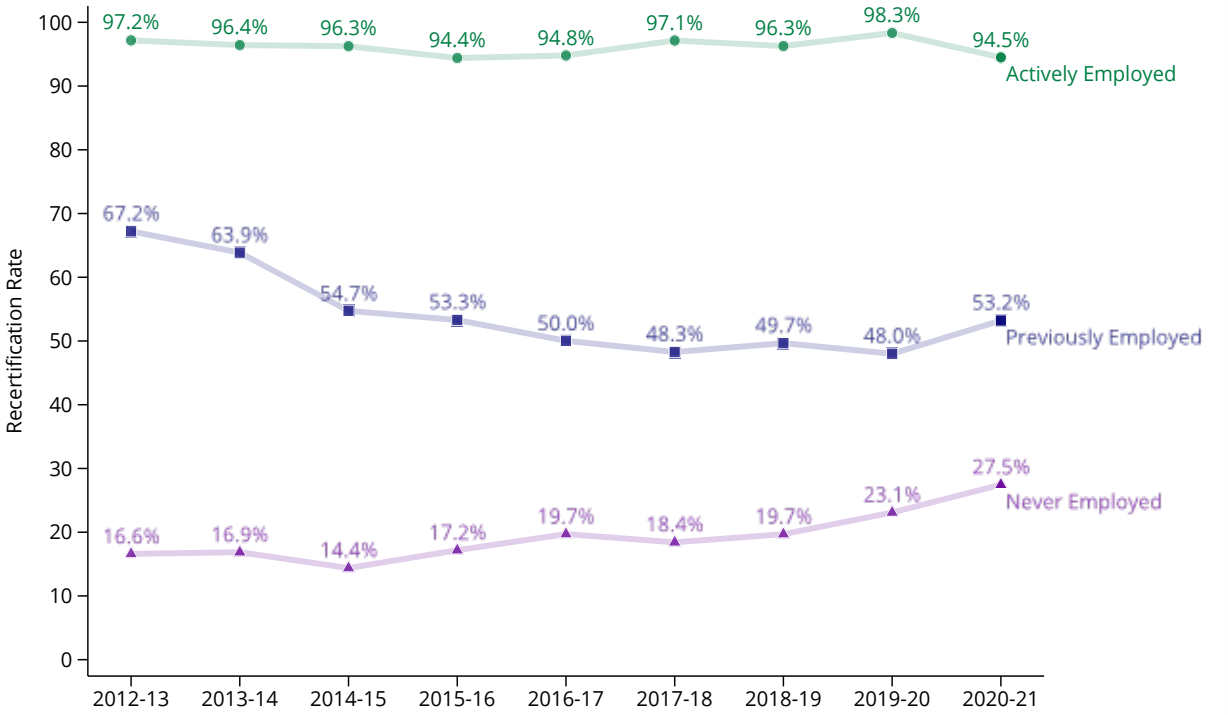
In our initial report, we showed that recertification rates were much higher for teachers who were actively employed in a traditional public school or charter school in Michigan in the school year leading up to when their certificates expired, compared to teachers who were not actively employed. We also showed that recertification rates were lowest for teachers completing their initial certification term, compared to teachers who have previously renewed or progressed their certificates. To delve deeper into these findings, Figure 4.9 shows recertification rates separately for three groups of individuals completing their initial certification terms: Actively employed Michigan public school teachers, former Michigan public school teachers who were no longer actively teaching, and certified teachers who never taught in a Michigan public school.[8] Recertification rates for the "never employed" group range from 14% to 28% depending on the year, while rates for the "previously employed" group range from 48% to 67%. "Actively employed" teachers have the highest recertification rates by far, ranging from 94% to 98%.

Actively Employed Teachers Were Less Likely to Maintain Their Teaching Certificates in 2020-21 Than in Earlier Years, While Teachers Who Were Not Actively Employed Were More Likely to Do So

The recertification rate for actively employed teachers decreased from 98.3% in 2019-20 to 94.5% in 2020-21. While this is still far higher than the rates for non-actively employed teachers, the decrease may be a result of increased stress and burnout that teachers experienced during the COVID-19 pandemic. Recertification rates for former Michigan public school teachers and certified teachers who have never taught in a Michigan public school, on the other hand, increased between 2019-20 and 2020-21. This could mean that increasing numbers of former teachers are considering returning to the profession or that increasing numbers of certified teachers who have never taught in a Michigan public school may be considering doing so in the future. This trend may be in response to MDE's efforts to bring

previously-certified teachers back into the classroom, such as the Welcome Back Proud Michigan Educator Campaign.[9]

Figure 4.9. Teacher Recertification Rates for Initial Certificates



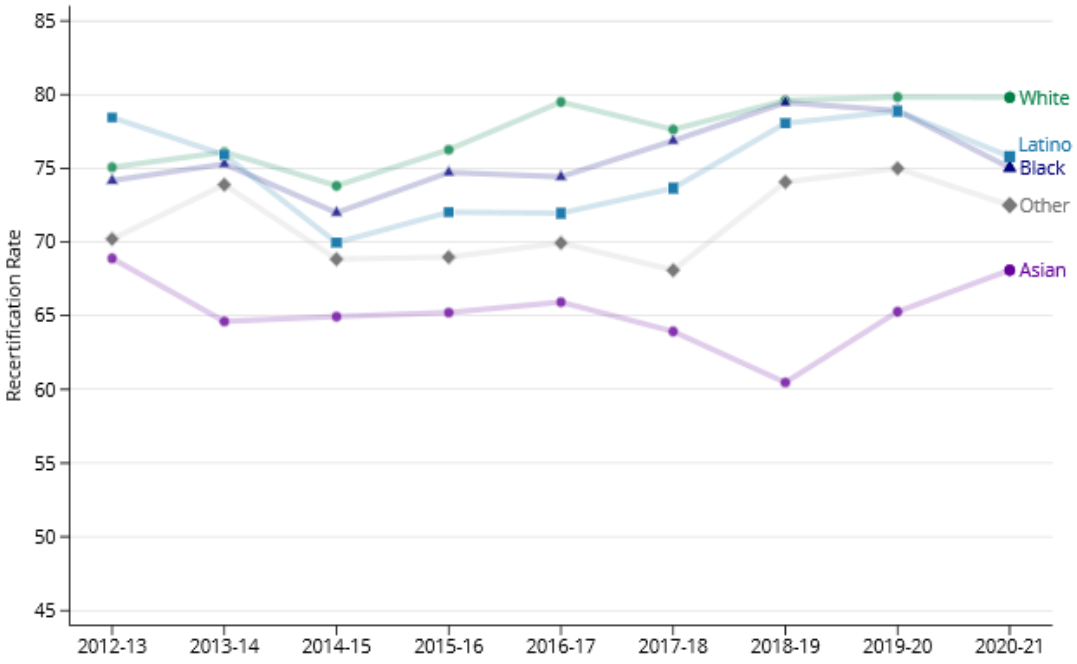
Note: Recertification rates represent the percentage of individuals with an expiring teaching certificate who renewed or progressed to a more advanced certificate no later than one year after their certificate expired. The rates in this figure only include teachers whose initial teaching certificates expired in a given year (and not teachers who have previously renewed or progressed their certificate). This figure does not include 2021-22 data because we cannot yet determine whether teachers whose certificates expired in 2021-22 renewed or progressed their certificates within the next year.

Recertification Rates Decreased for Black and Latino Teachers, Increased for Asian Teachers, and Remained about the Same for White Teachers

Given the substantial amount of research showing the importance of having a diverse teacher workforce for both White and non-White students (Dee, 2004, 2005; Egalite et al., 2015; Gershenson et al., 2016; Harbatkin, 2021), we further break down these rates by teacher race and ethnicity. In last year's report, we showed that recertification rates for Black, Latino, and Asian teachers were lower than those for White teachers but increased somewhat in recent years.[10] Figure 4.10 shows that in 2021-22, recertification rates for White teachers remained about the same and those for Asian teachers continued to increase. However, the rates for Black and Latino teachers, as

well as teachers of other races/ethnicities, decreased. While we do not have a definitive explanation for why these rates decreased for Latino and Black teachers, we know that these teachers tend to teach in more urban, high-poverty areas across the state (Hopkins et al., 2021). It is possible that teachers in these types of districts experienced greater burnout and stress during the COVID-19 pandemic.

Figure 4.10. Teacher Recertification Rates by Race, All Certificate Holders



Note: Recertification rates represent the percentage of individuals with an expiring teaching certificate who renewed or progressed to a more advanced certificate no later than one year after their certificate expired. This figure does not include 2021-22 data because we cannot yet determine whether teachers whose certificates expired in 2021-22 renewed or progressed their certificates within the next year. The "other" race/ethnicity category includes teachers who are American Indian or Alaska Native, Native Hawaiian or Pacific Islander, or two or more races; we cannot show results for these races/ethnicities separately due to the low number of teachers in each group.

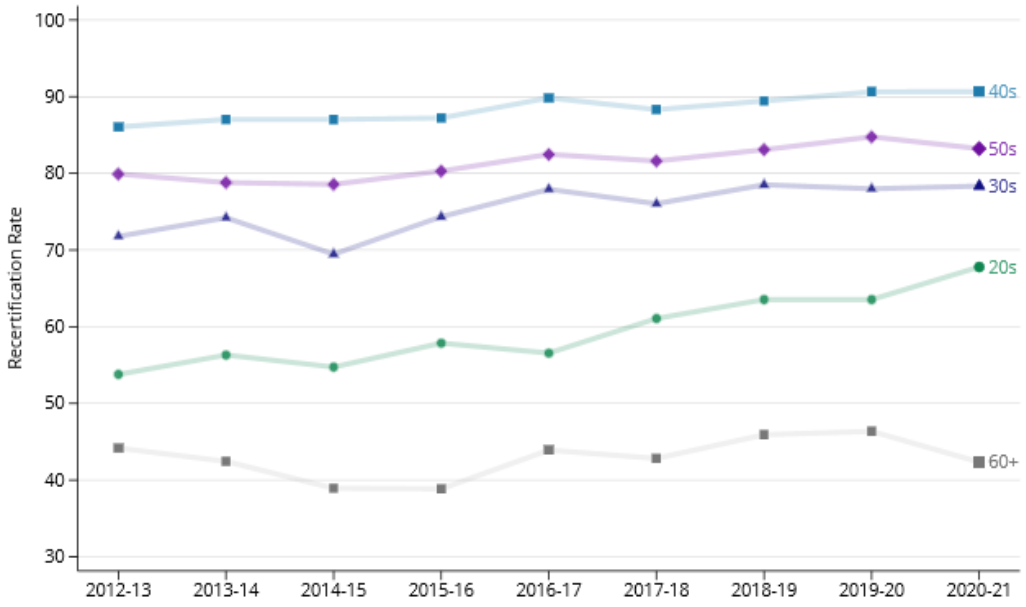
Recertification Rates Increase With Age for Teachers in Their 20s to 40s, Then Decline as Teachers Start to Reach Retirement Eligibility

Our previous report showed that newer teachers with initial certificates that are up for renewal for the first time have lower recertification rates than more experienced teachers who previously renewed or progressed their certificates. Thus, it is not surprising that, as Figure 4.11 shows, recertification rates increase with teachers' age, with teachers in their 30s more likely to recertify than teachers in their 20s, and teachers in their 40s more likely to recertify than teachers in their 30s. As teachers start to become eligible for retirement in their 50s and 60s, their recertification rates decrease.

Teachers in Their 20s Were More Likely to Maintain Their Credentials in Recent Years, While Teachers Close to Retirement Were Less Likely

While still below those of teachers in their 30s to 50s, recertification rates for teachers in their 20s have consistently increased from year to year since 2016-17. This group of teachers experienced a particularly large increase in recertification in 2020-21. In comparison, recertification rates remained about the same for teachers in their 30s and 40s and decreased for teachers in their 50s and 60s. While we again do not have a definitive explanation for the decreases in recertification rates for teachers nearer to retirement, it seems plausible that these teachers felt more at risk during the COVID-19 pandemic given the virus's greater health effect on individuals in that age range. This may have caused teachers over 50 years of age to decide to leave the workforce at higher rates.

Figure 4.11. Teacher Recertification Rates by Age, All Certificate Holders



Note: Recertification rates represent the percentage of individuals with an expiring teaching certificate who renewed or progressed to a more advanced certificate no later than one year after their certificate expired. This figure does not include 2021-22 data because we cannot yet determine whether teachers whose certificates expired in 2021-22 renewed or progressed their certificates within the next year.

SUMMARY

The analyses in this section highlight substantial shifts in educator retention, attrition, and mobility during and in the wake of the COVID-19 pandemic. While teachers were far less likely to enter or exit the profession or to move between districts in 2020-21 than in earlier years, they were far more likely to do so in 2021-22. Shifts in the rates of mobility and entry into the teaching profession may be related to teachers' decisions to delay major employment changes, like starting their first teaching jobs or moving to a different district, until after most schools returned to in-person instruction in 2021-22. Increases in attrition, on the other hand, may point to increased stress and burnout during the COVID-19 pandemic.

Section Five: Teacher Preparation

This section addresses the third reporting requirement outlined in 2020 PA 316:

> *The number of graduates from approved, in-state teacher preparation programs, disaggregated by the broad subject areas and educational settings of those graduates, if any.*

With record-high rates of Michigan teachers leaving their districts and leaving the teaching profession altogether, the incoming supply of new teachers from Michigan's teacher preparation programs will be particularly critical as districts work to staff their schools. In this section, we provide updates to the trends in newly issued teaching certificates from our initial report that now include new data from the 2021-22 school year, as well as a new set of analyses examining where and what recent graduates from Michigan's teacher preparation programs are teaching.

INITIAL TEACHING CERTIFICATES

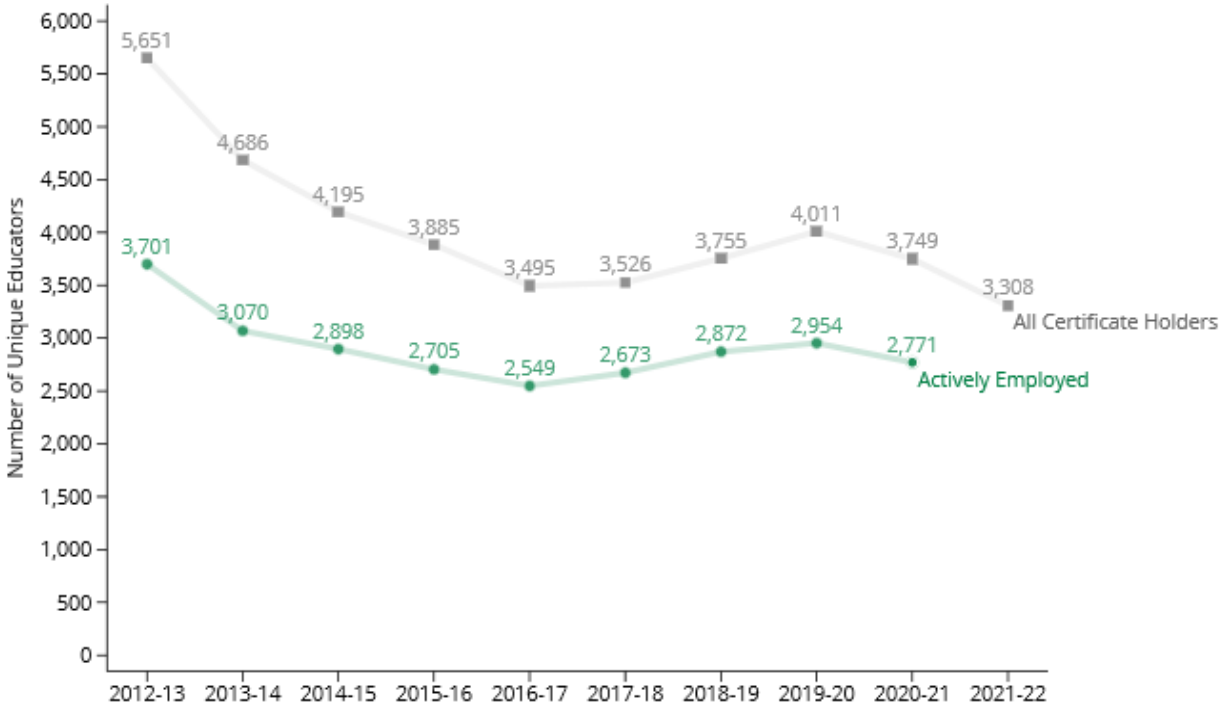
As we showed in last year's report, the numbers of newly issued Michigan teaching certificates decreased for several years then began to increase in 2016-17 and continued to do so each year through 2019-20. We've updated these analyses using newly available data about Michigan teaching certificates issued during the 2020-21 and 2021-22 school years.

Since the Onset of the COVID-19 Pandemic, Michigan Has Issued Fewer Initial Teaching Certificates Each Year

Figure 5.1 shows the total number of teachers who were issued an initial Michigan teaching certificate each year, overall and for the subset who were "actively employed" (i.e., who taught in a traditional public school or charter school in Michigan within a year of earning their certificates). Each year after 2019-20, the number of teachers earning new certificates decreased. Although we do not yet know how many of the teachers who earned initial certificates in 2021-22 ended up teaching within the next year, the decrease in newly certified, actively employed teachers between 2019-20 and 2020-21 (shown in the green line in Figure 5.1) was not as stark as the overall decrease in newly certified teachers (shown in the grey line). While there is still a substantial

number of teachers each year who become certified but do not teach in a traditional public school or charter school in Michigan, the gap between the green and grey lines has become smaller over time. This trend suggests that even though fewer people earned certificates in recent years than at the peak in 2019-20, those who did earn certificates were more likely to work as public school teachers in Michigan, compared to earlier cohorts of teacher candidates.

Figure 5.1. Teachers Issued Initial Certificates (All Certificate Holders and the Subset Who Were Actively Employed as Public School Teachers Within the Next Year)



Note: The grey line represents the number of unique educators who were issued an initial teaching certificate; the green line represents the subset who were actively employed as Michigan public school teachers within a year of earning their teaching certificate. The green line does not extend to 2021-22 because we cannot yet determine whether teachers who earned certificates that year were employed within the next full year.

Declines in New Teaching Certificates Affected All Grade Ranges, Subject Areas, and Educational Settings

Figure 5.2 shows similar trends in initial teaching certificates for both elementary and secondary programs, though there are consistently more people earning elementary certificates each year than secondary. Trends in new certificates with language arts and social studies endorsements, shown in Figure 5.3, generally mirror the overall trends shown in Figure 5.1, while in math and science we see more consistent declines

across the full 10-year time span. Certificates with special education endorsements, shown in Figure 5.4, also mirror the overall trend in Figure 5.1, while certificates with world language and ESL or bilingual education endorsements have stayed within a consistent range over time, with some fluctuation from year to year.

Figure 5.2. Teachers Issued Initial Certificates by Program Type

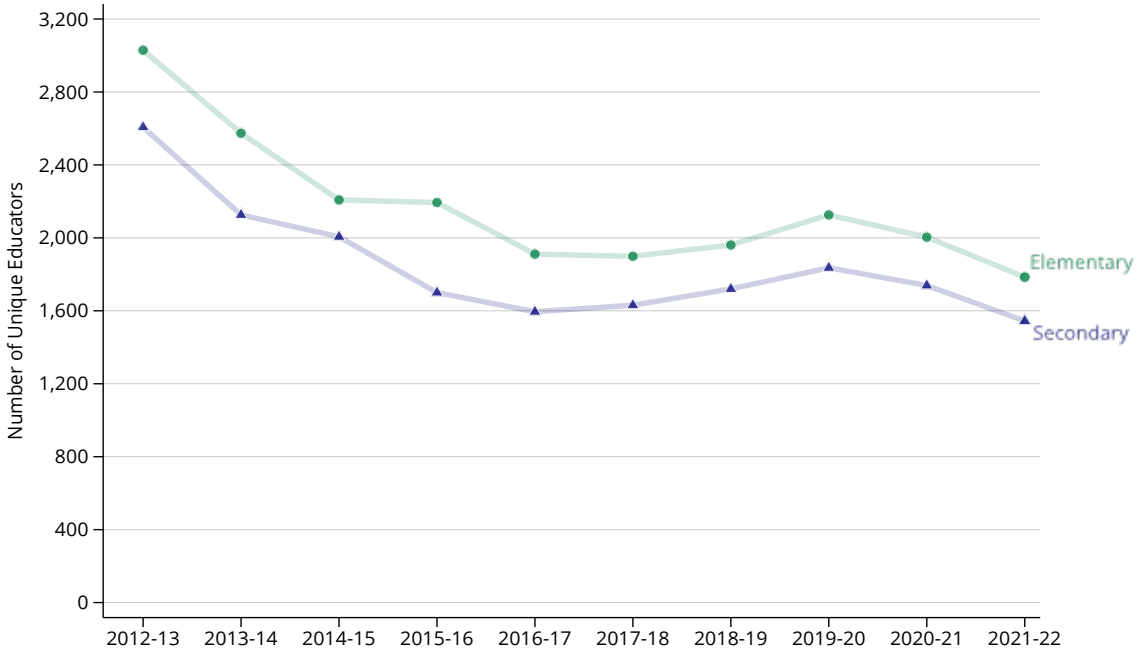


Figure 5.3. Teachers Issued Initial Certificates by Core Subject Area

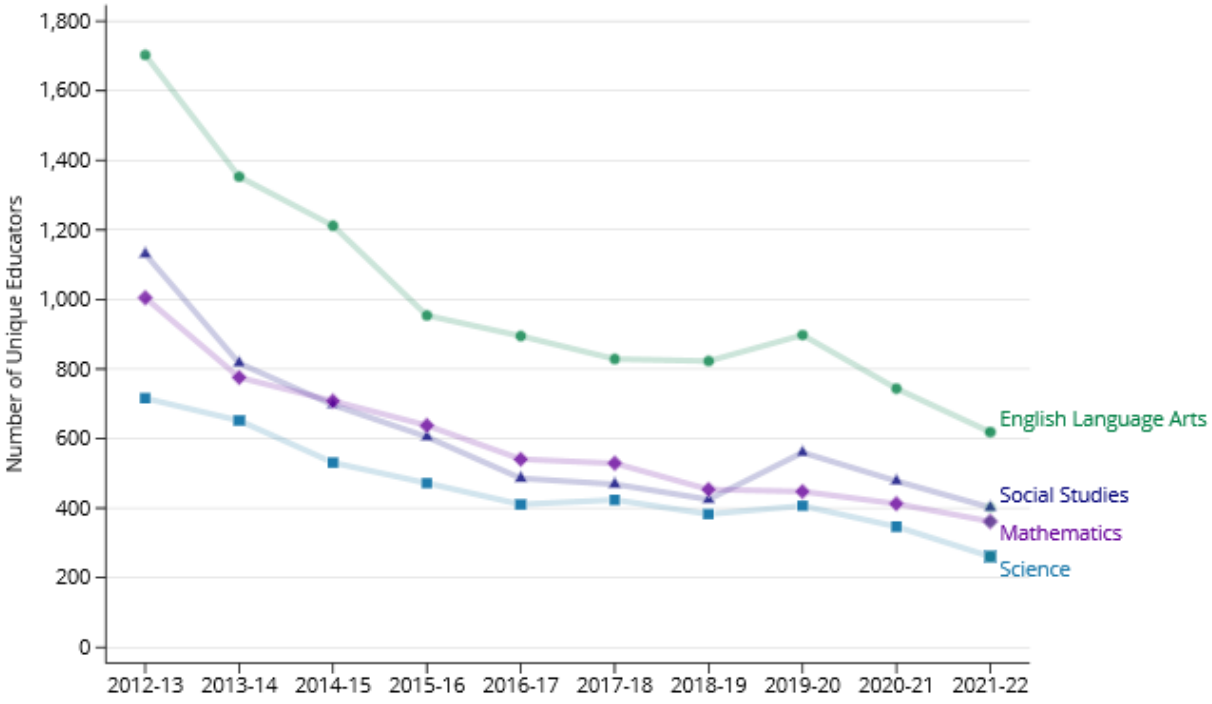
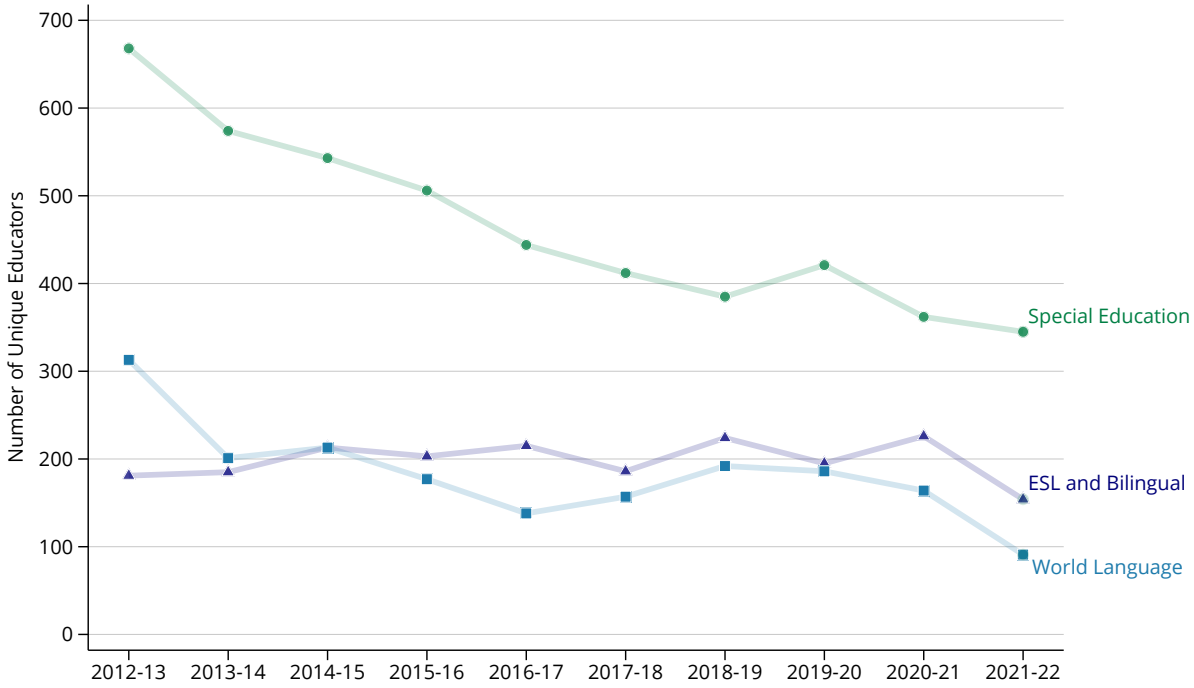


Figure 5.4. Teachers Issued Initial Certificates by Subject Area or Educational Setting



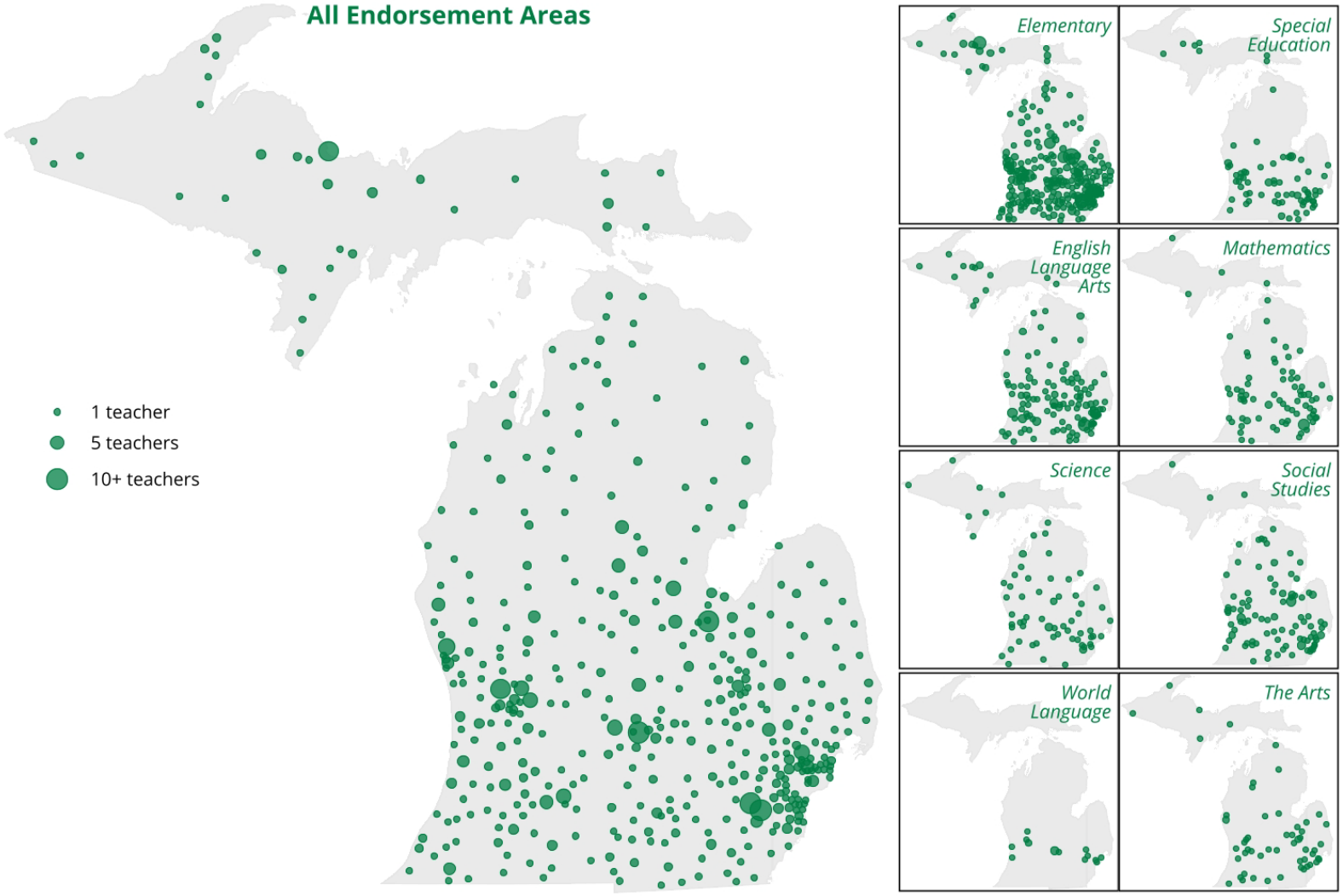
TEACHER PREPARATION PROGRAM GRADUATES

To develop programs and policy solutions to bring more prospective teachers to the areas where they are needed the most, it is important to understand where the graduates from Michigan's teacher preparation programs go after they earn their credentials. In this section, we examine the locations of recent graduates' first teaching jobs, overall, by subject, and by teacher preparation provider.

Recent Graduates From Michigan Teacher Preparation Programs Worked as First-Year Teachers Throughout the State in 2021-22, But New Graduates With Some Specializations Were Rare in Many Regions

Figure 5.5 shows the locations where graduates of in-state teacher preparation programs worked as first-year teachers in 2021-22, overall and by endorsement area. Overall, there were new graduates working as first-year teachers in most areas of the state.

Figure 5.5. Locations of All In-State Teacher Preparation Program Graduates' First Teaching Jobs, 2021-22



The general density of new teachers reflects the approximate population distribution across Michigan, with more new teachers entering the labor force near large urban metropolitan areas and in the more populous middle and southern regions of the Lower Peninsula. Notably, there were very few graduates with world language endorsements working as first-year teachers anywhere except a few concentrated areas in south-central Michigan. Moreover, very few new graduates with special education endorsements taught in the northern half of the Lower Peninsula. Very few teachers with mathematics, social studies, or arts endorsements taught in the Upper Peninsula. It may be that these areas required fewer of these specialized teachers, or that they had a more difficult time attracting and hiring them.

More Than Half of All First-Year Teachers From In-State Preparation Programs Taught Within 30 Miles of Their Postsecondary Institutions

We also consider the distance between graduates' teacher preparation programs and the locations of their first teaching jobs, and how this varies among Michigan's many teacher preparation programs. Extant research has shown time and again that teachers prefer to teach "close to home" (Boyd et al., 2005; Reininger, 2012) or near their teacher preparation programs (Fowles et al., 2014) and student teaching placements (Krieg et al., 2016), and this appears to be the case in Michigan as well. For each of the 27 university-based providers with 10 or more graduates who worked as first-year teachers in 2021-22, Table 5.1 shows the total number of graduates working as first-year teachers and the percentage of those graduates whose teaching jobs were located within 30 miles of the teacher preparation provider.[11] Fifty-five percent of all graduates taught within 30 miles of their postsecondary institution's main campus.

Table 5.1. First-Year Teachers from In-State Teacher Preparation Programs, 2021-22

Teacher Preparation Provider (University-based providers with at least 10 graduates working as first-year teachers)	First-Year Teachers in 2021-22	Percent Teaching Within 30 Miles of Provider
Wayne State University	156	94%
University of Michigan - Dearborn	53	92%
Oakland University	190	87%
University of Michigan - Flint	50	82%
Schoolcraft College	75	81%
Rochester University	10	80%
Eastern Michigan University	292	76%
Calvin University	48	71%

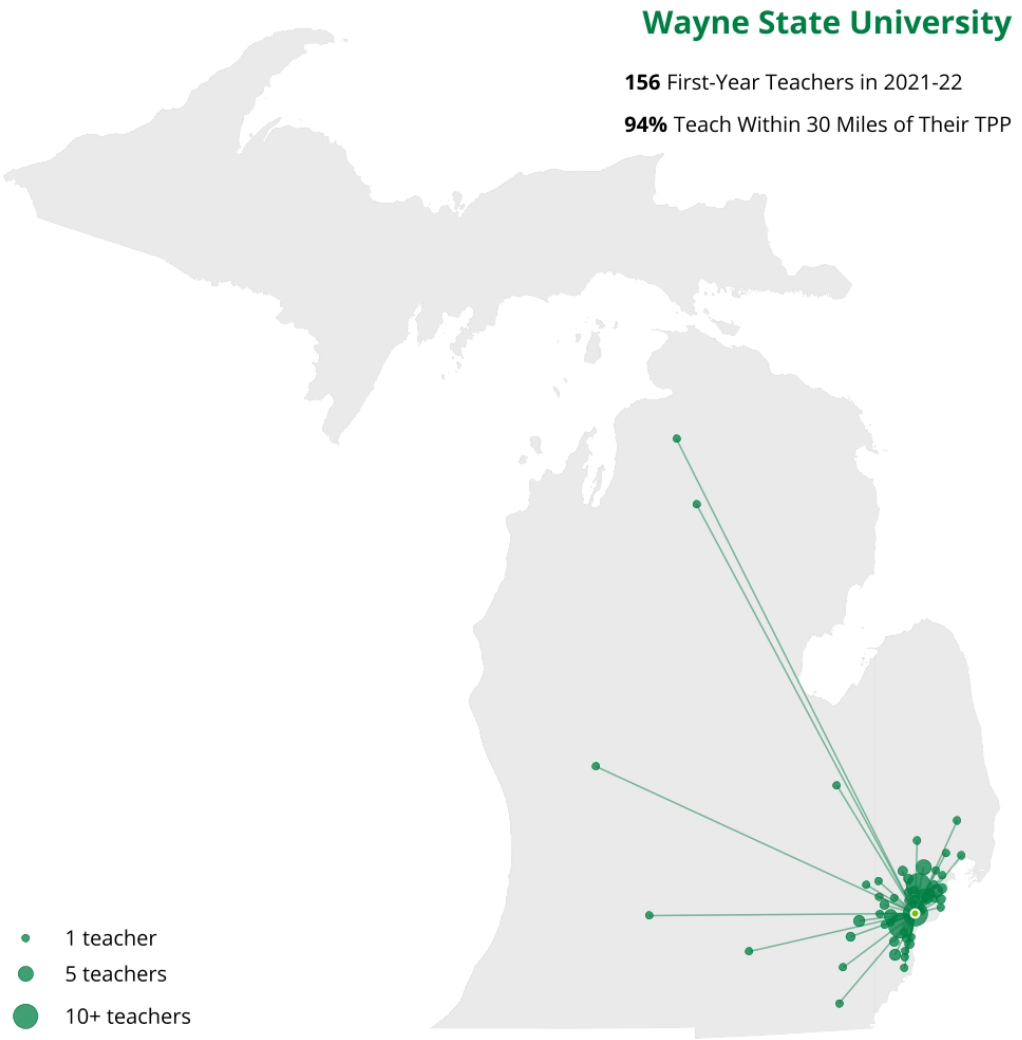
Siena Heights University	17	65%
Aquinas College	41	61%
Hope College	54	61%
Davenport University	17	59%
Cornerstone University	32	56%
Madonna University	20	55%
Grand Valley State University	338	52%
University of Michigan - Ann Arbor	106	52%
Western Michigan University	180	51%
Spring Arbor University	37	43%
Saginaw Valley State University	167	42%
Lake Superior State University	17	41%
Albion College	14	36%
Adrian College	25	32%
Michigan State University	241	25%
Northern Michigan University	77	23%
Ferris State University	89	19%
Alma College	28	18%
Central Michigan University	311	15%

Note: The higher education institutions in this table are listed in order from the highest to lowest percentage of teacher preparation program graduates teaching within 30 miles. These calculations include graduates from all traditional and alternative route programs that the institution offers.

Some of Michigan's Teacher Preparation Programs Primarily Serve Their Local Area While Others Serve a Widespread Range of Areas Throughout the State

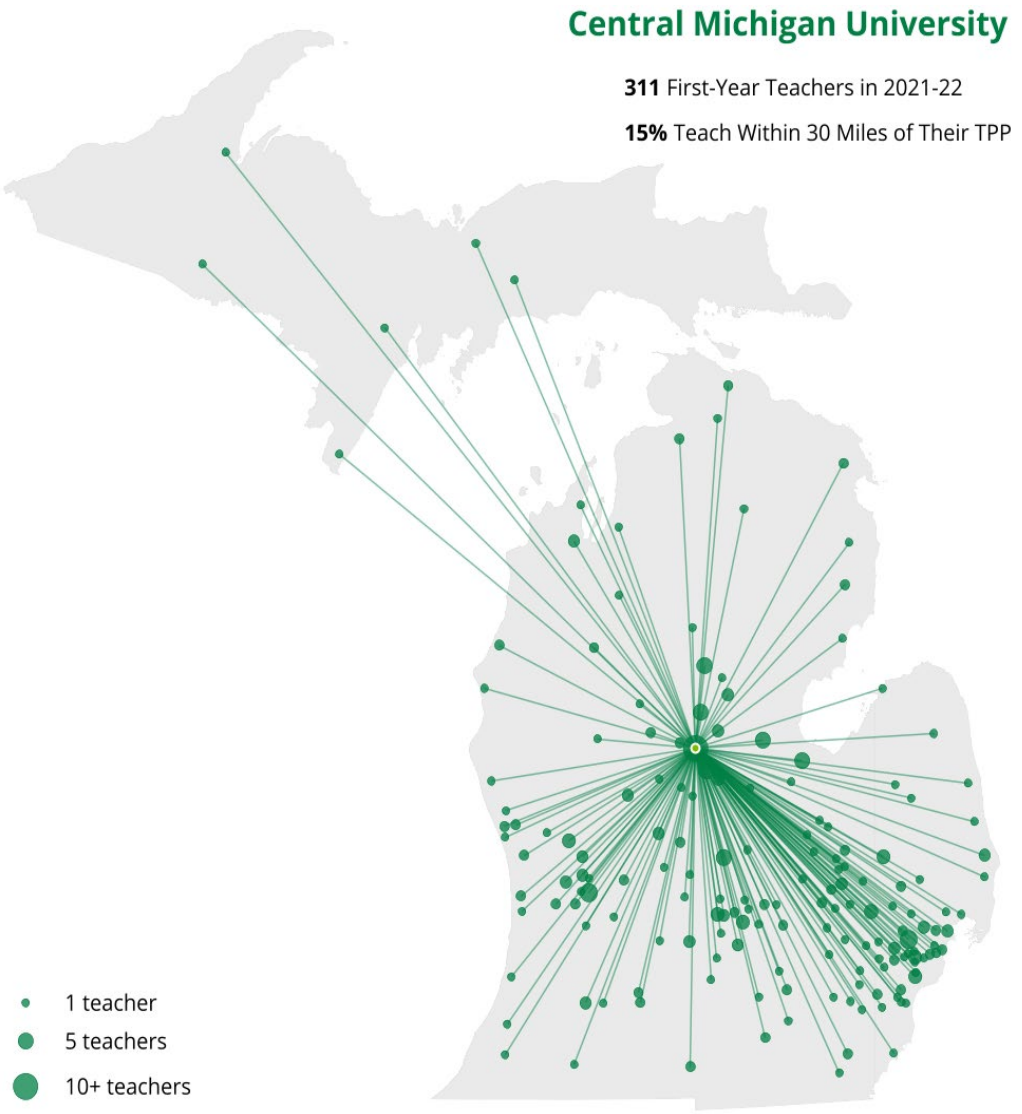
It is clear from Table 5.1 that graduates' tendencies to remain within or to leave the local area for their first teaching jobs varies widely by program. At one end of the spectrum, 94% of first-year teachers from Wayne State University's preparation program taught within 30 miles of the university. Figure 5.6 shows the locations of first-year teachers who graduated from Wayne State University (represented by the dark green dots), relative to the location of the university (represented by the lime green dot), with lines depicting the distance between the university and the districts where graduates worked in 2021-22. Nearly all first-year teachers from Wayne State remained in the Metro Detroit area, while a very small number moved to other parts of the state.

Figure 5.6. Locations of Teacher Preparation Program Graduates' First Teaching Jobs, 2021-22 — Program With the Highest Percentage of Graduates Teaching Locally



Central Michigan University (CMU) is at the other end of the spectrum, with only 15% of graduates working as first-year teachers within 30 miles of the university. Figure 5.7 shows the locations of CMU graduates' first teaching jobs, relative to the university's location. Graduates from this program worked as first-year teachers in nearly every region of the state, with somewhat larger numbers of graduates going to the more highly populated areas of the state, likely because more teaching jobs were available in those areas.

Figure 5.7. Locations of Teacher Preparation Program Graduates' First Teaching Jobs, 2021-22 — Program With the Lowest Percentage of Graduates Teaching Locally

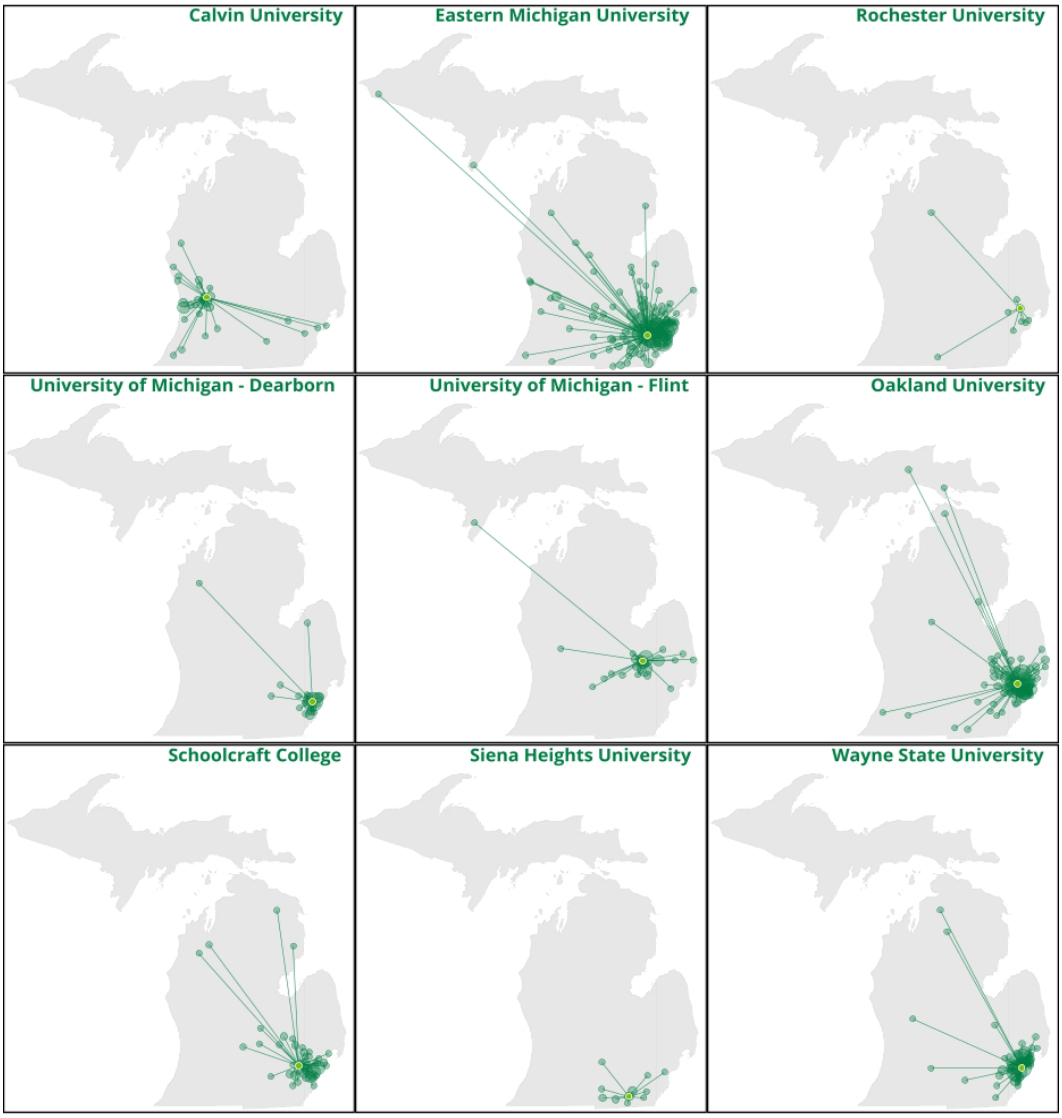


Most of the Programs Whose Graduates Teach Locally Are in the Southeastern Part of the State

While both Wayne State and Central Michigan have fairly large teacher preparation programs, Table 5.1 shows that there are programs of all sizes where the vast majority of graduates remain in the local area, where the vast majority leave the local area, and where there are large proportions of graduates both remaining within and leaving the local area for their first teaching jobs. However, there are notable differences in how far graduates tend to go from their programs depending on the location of the program.

Figure 5.8 shows the locations of first-year teachers from each of the nine programs with the highest percentages of graduates that remain in the local area (i.e., the first nine programs listed in Table 5.1). Eight of these nine programs are in the southeastern part of the state and the 9th is in Grand Rapids.

Figure 5.8. Locations of Teacher Preparation Program Graduates' First Teaching Jobs, 2021-22 – Programs Primarily Serving Local Areas

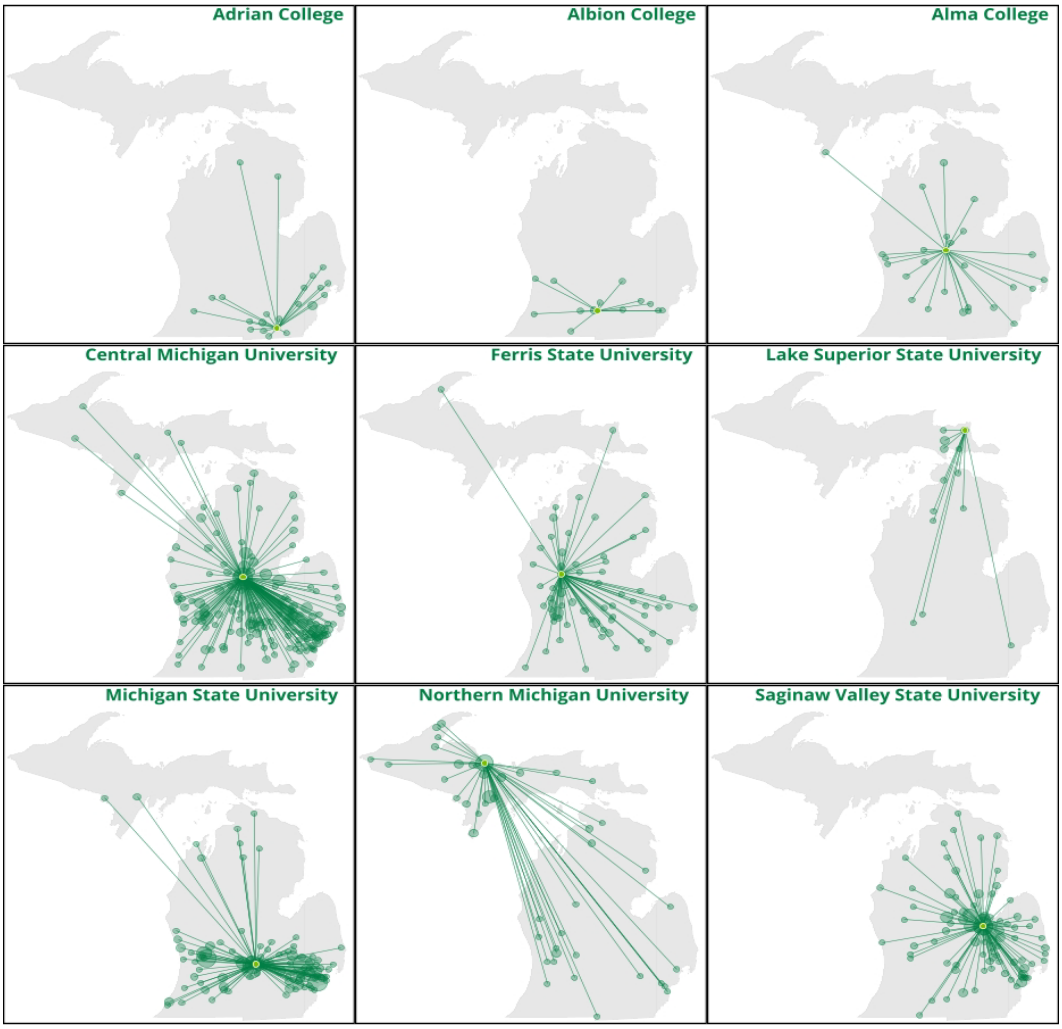


One possible explanation for this pattern is that these programs are in highly populated areas where there may be more teaching jobs available. These programs may also serve more students who grew up in the local area themselves. For instance, the University of Michigan – Flint has one of the highest percentages in the country of freshmen who commute to campus (Moody, 2021), and past research has shown that teachers prefer to work in areas that are nearby or similar to their hometowns (Boyd et al., 2005; Reininger, 2012).

Graduates From Many Programs in Central Michigan and the Upper Peninsula Tend to Leave the Local Area for Their First Teaching Jobs

Figure 5.9 shows the locations of first-year teachers from each of the nine programs with the lowest percentages of graduates that remain in the local area. Many of these programs are in mid-Michigan or the Upper Peninsula.

Figure 5.9. Locations of Teacher Preparation Program Graduates' First Teaching Jobs, 2021-22 — Programs Primarily Serving Distant Areas



Although most graduates from these programs left the local area, they did not always reach all areas of the state. For instance, graduates from Saginaw Valley State worked as first-year teachers in most areas of Michigan's Lower Peninsula but nowhere at all in the Upper Peninsula in 2021-22. Graduates from Michigan State, Adrian College, and Albion College moved both east and west for their first teaching jobs but rarely

left the southern part of the Lower Peninsula. Most graduates from Lake Superior State moved to the Lower Peninsula for their first teaching jobs, and those who remained in the Upper Peninsula stayed close to the area where they went to school. Most of the new teachers elsewhere in the Upper Peninsula came from either Northern Michigan University or Central Michigan University.

Figure 5.10. Locations of Teacher Preparation Program Graduates' First Teaching Jobs, 2021-22 — Programs Serving Both Local and Distant Areas

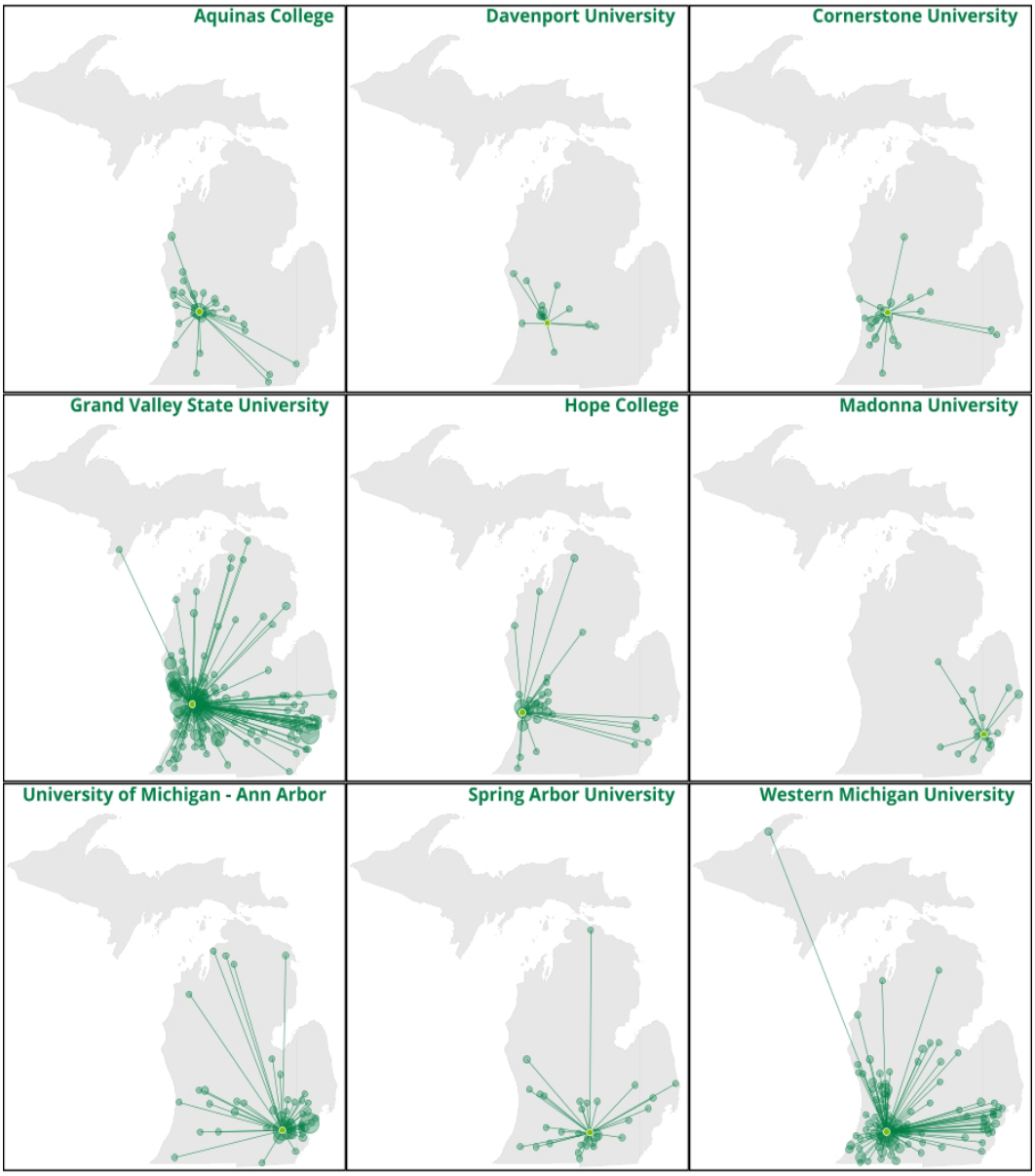


Figure 5.10 shows the locations of graduates from the remaining nine programs, which serve a combination of local and distant areas. All these programs are in the southern half of the Lower Peninsula, including several in the Grand Rapids area. Graduates

from this group of programs tend to serve a slightly broader area than the programs in Figure 5.8 but are not nearly as widespread throughout the state as some of the programs in Figure 5.9.

SUMMARY

Following several years of declines, the number of new teachers becoming certified in Michigan increased each year from 2016-17 through 2019-20. However, the number of newly issued Michigan teaching certificates began to decrease again after the onset of the COVID-19 pandemic; this decrease affects all grade ranges, subject areas, and educational settings. While there were graduates from Michigan's teacher preparation programs working as first-year teachers throughout nearly every part of the state in 2021-22, graduates with specific specializations tended to stay within certain areas. In particular, there were very few newly certified world language or special education teachers working outside of the southern half of the Lower Peninsula. Newly certified teachers from some in-state preparation programs worked almost exclusively in the local area where they went to school, while graduates from other programs were scattered throughout the state. These vast differences in the locations where graduates from each program tend to work are important to consider when designing programs and policy solutions to increase the number of available teachers in the areas where they're needed the most.

Section Six: Highest-Need Regions

In this section, we address the final reporting requirement detailed in 2020 PA 316:

> *An analysis of the regions in this state that present the highest need for educators based on educator shortages in those regions, disaggregated by the broad subject areas and educational settings of the positions in which there are shortages in those regions.*

To assess the extents of shortages in different areas of the state, we consider several of the indirect indicators of teacher shortages from Sections Three and Four, including changes in total number of teachers employed, the use of temporary teaching credentials, placement of teachers outside their endorsement area, reliance on multi-site and third-party virtual teachers, rates of entry into and exit from the profession, rates of teacher transfers within and between districts, and the share of all teachers who are inexperienced or new to their current district.[12]

While none of these indicators can definitively identify the locations or extent of local teacher shortages in Michigan, we examine patterns across many imperfect indicators of teacher shortages to identify areas of the state that consistently and repeatedly stand out and compare these to the geographic distributions of in-state preparation program graduates from Section Five. Still, these are only estimates and not direct measures of shortages. While we can use these to highlight areas that are likely experiencing more severe teacher shortages, policymakers and other stakeholders should always consider other information as well when making decisions about where and how to address local teacher shortages.

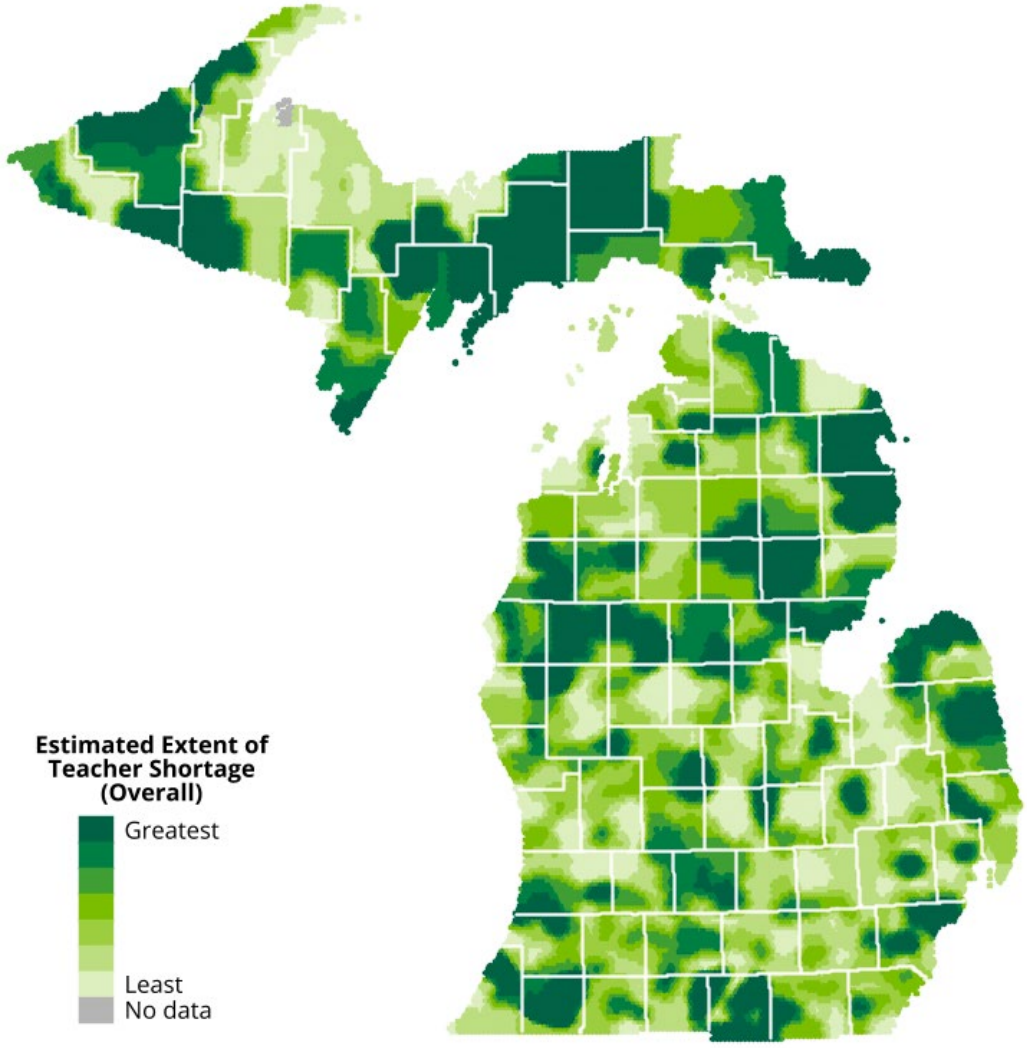
OVERALL TEACHER SHORTAGES

The heat maps throughout this section show the estimated extent of overall and subject-specific teacher shortages in each location of the state, based on the composites measure that we constructed using a principal component analysis approach. The color scale in each figure ranges from "least extent" to "greatest extent,"[13] relative to the extent of shortages in other areas in Michigan. Thus, these estimates do not tell us whether there *is* a teacher shortage in a given area, but rather, how the *extent* of shortages in that area compares to the extent of shortages elsewhere in the state.

Teacher Shortages Are Very Local; the Extent of Overall Shortages Varies Widely Even Within Each Region of the State

In Figure 6.1, most of the variation in the extent of teacher shortages is at the local level rather than across broad regions of the state. In most of Michigan's prosperity regions, there are some local areas experiencing shortages to greater and lesser extents.[14] In other words, Michigan's teacher shortages are very local, and can vary substantially within relatively small geographic areas.

Figure 6.1. Estimated Extent of Overall Teacher Shortages



Note: The overall teacher shortage composite measure is based on between-district transfer rates, shares of inexperienced teachers, shares of newly hired teachers, net changes in the number of teachers employed, shares of teachers who work in multiple districts, shares of "teachers of record" and teaching FTEs assigned to teachers without an appropriate certificate or endorsement, and districts' relative ranking across all subject-specific shortage indicators for elementary, special education, ELA, math, science, social studies, world language, and the arts (Cronbach's alpha=0.80).

In parts of the Upper Peninsula and northern Lower Peninsula, severe shortages are particularly widespread across large geographic areas. However, it is important to note that these regions include many rural districts that span large geographic areas (e.g., an entire county), and that some of these geographically widespread shortages are driven by a single district. In the eastern part of the state, for instance, parts of Huron and Sanilac counties stand out as having particularly widespread shortages, although there are more localized areas in other parts of this region that are also likely experiencing severe shortages. Severe shortages in the Detroit Metro area are generally more widespread in Wayne County and more localized in Oakland and Macomb counties. Along the southern border of the state, Cass and Hillsdale counties show evidence of widespread, acute shortages, while severe shortages in Berrien, Branch, and Lenawee counties are more localized in districts within each county. In Mid-Michigan, there are several areas in the darkest shade of green directly next to areas in the lightest shade. This suggests that teachers are not evenly distributed across localities even within these counties and some districts face severe teacher shortages while their nearest neighbors suffer relatively few challenges with respect to staffing their schools.

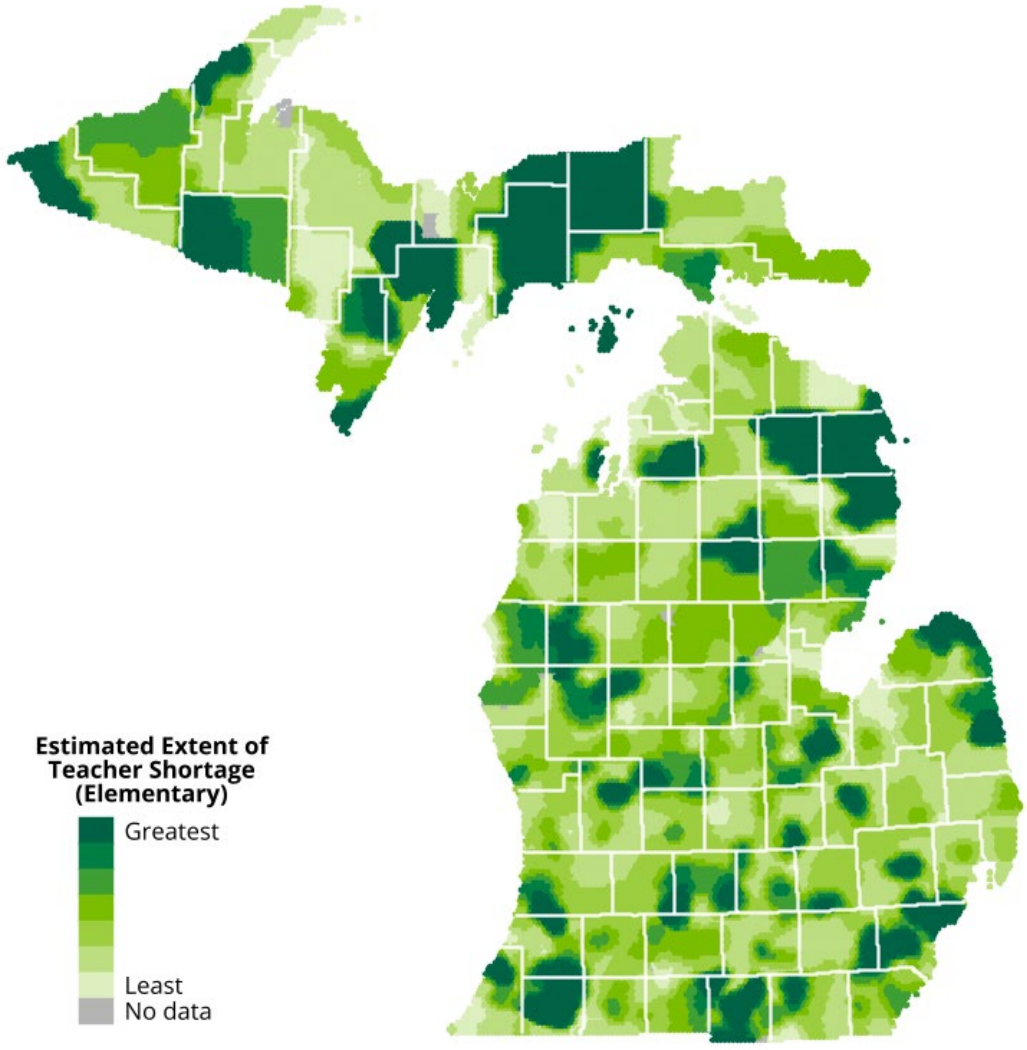
SUBJECT AREA SHORTAGES

We also constructed composite measures of teacher shortages within several subject areas and educational settings. We derived these measures from the same types of indicators as the overall measure, however, the subject-specific measures only include indicators that are specific to the same subject area or educational setting, whereas the overall composite measure include both overall indicators and subject-specific indicators. In other words, each of the subject-specific measures is based on fewer indicators (i.e., less information) than the overall measure. As a result, the subject-specific measures generally provide less reliable estimates of relative shortages than the overall measure. While these estimates are still helpful for visualizing patterns in relative teacher shortages and understanding the nature of shortages in certain areas, they should be interpreted with caution.

Severe Elementary Teacher Shortages Are Mostly Contained Within a Few Areas of the State

Figure 6.2 shows the estimated extent of elementary teacher shortages throughout Michigan. Compared to overall shortages, there is somewhat less variation in the extent of elementary teacher shortages both within and between broad regions of the state. This finding aligns with our analysis of teacher preparation program graduates' placement as first-year teachers in Section Five; as we saw in Figure 5.5, newly certified elementary teachers taught in all areas of the state in 2021-22, while those specializing in other subjects or student groups were scarce in some regions.

Figure 6.2. Estimated Extent of Elementary Teacher Shortages



Note: The elementary teacher shortage composite measure is based on between-district transfer rates, shares of inexperienced teachers, shares of newly hired teachers, net changes in the number of teachers employed, and shares of "teachers of record" and teaching FTEs assigned to teachers without an appropriate certificate or endorsement (Cronbach's alpha=0.73).

Some of the same areas with particularly widespread and severe overall teacher shortages in Figure 6.1 also stand out in Figure 6.2 as having more acute elementary teacher shortages. These include parts of the Upper Peninsula and northern Lower Peninsula, Cass and Hillsdale counties along the southern border of the state, and Wayne, Huron, and Sanilac counties on the eastern side of the state. By contrast, the most severe elementary teacher shortages in mid-Michigan are more localized, existing in specific districts or communities rather than across entire counties.

Districts in Northern Michigan and the Upper Peninsula Are Facing Particularly Severe Subject Area Shortages

Figure 6.3 shows the estimated extent of special education teacher shortages. Many of the areas with more severe special education shortages are in northern Michigan and the Upper Peninsula. While Figures 6.1 and 6.2 showed severe overall and elementary teacher shortages in these same regions, not all the specific counties experiencing the most severe overall or elementary teacher shortages are the same as those experiencing the most acute special education teacher shortages.

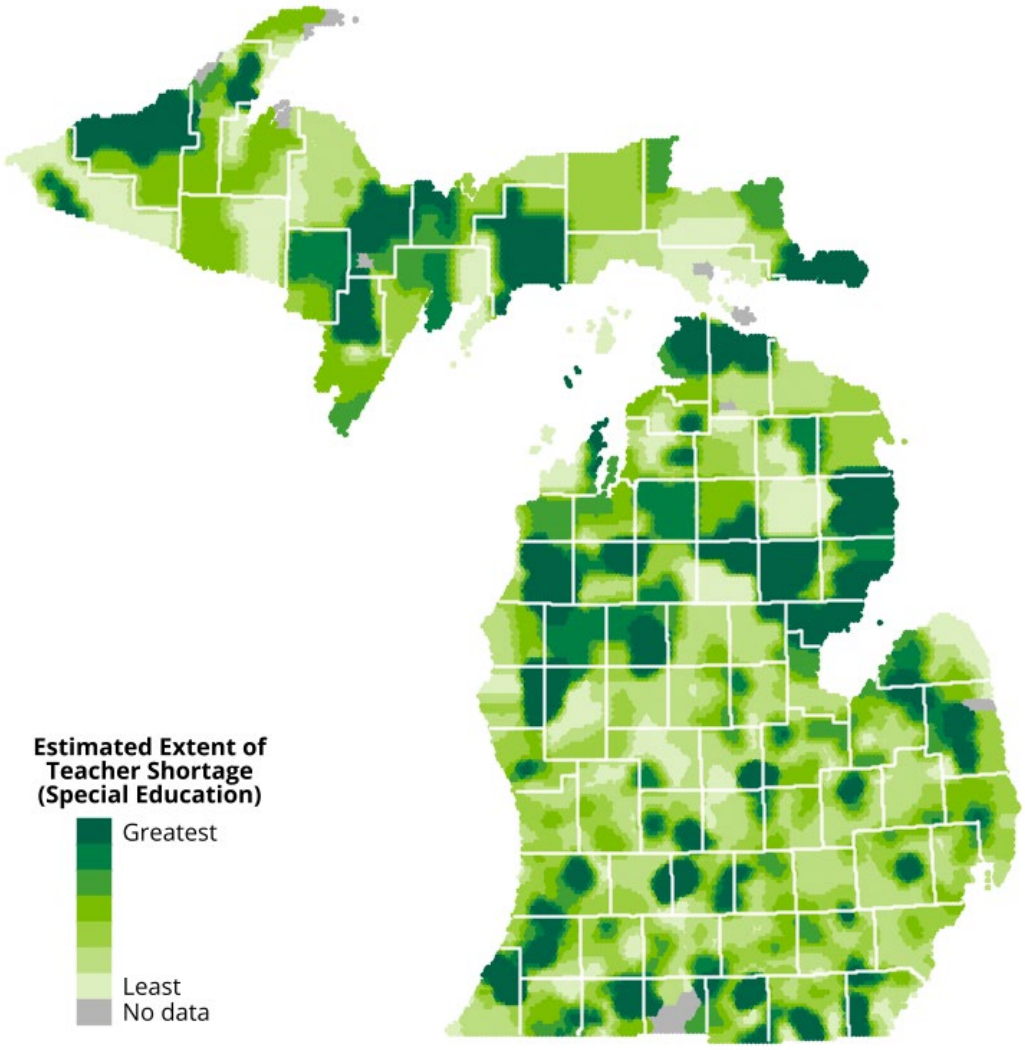
As we show throughout the remainder of this section and in Figures 6.4 through 6.9, many of the areas experiencing the most severe ELA, math, science, social studies, world language, and art/music teacher shortages are also in the Upper Peninsula and northern half of the Lower Peninsula. In Section Five, we showed that few first-year teachers from in-state preparation programs were teaching in these regions of the state in 2021-22. Moreover, graduates from the teacher preparation programs in these areas rarely went on to teach in nearby districts. Combined, these findings suggest that the supply of teachers in these areas may not be sufficient to meet the demand.

Many Districts in Southern, Central, and Eastern Michigan Are Facing Acute Shortages of Core Subject Teachers

Figures 6.4 through 6.7 show the estimated extents of local ELA, math, science, and social studies teacher shortages. While many of the areas with severe elementary and special education teacher shortages also have severe shortages of core subject-specific teachers as well, this set of maps reveals additional core subject teacher shortages in other parts of the state. Core subject teacher shortages are relatively severe in and near Calhoun, Eaton, and Ionia counties in mid-Michigan as well as some counties along the southern border of the state, while elementary and special education shortages are less acute in these regions.

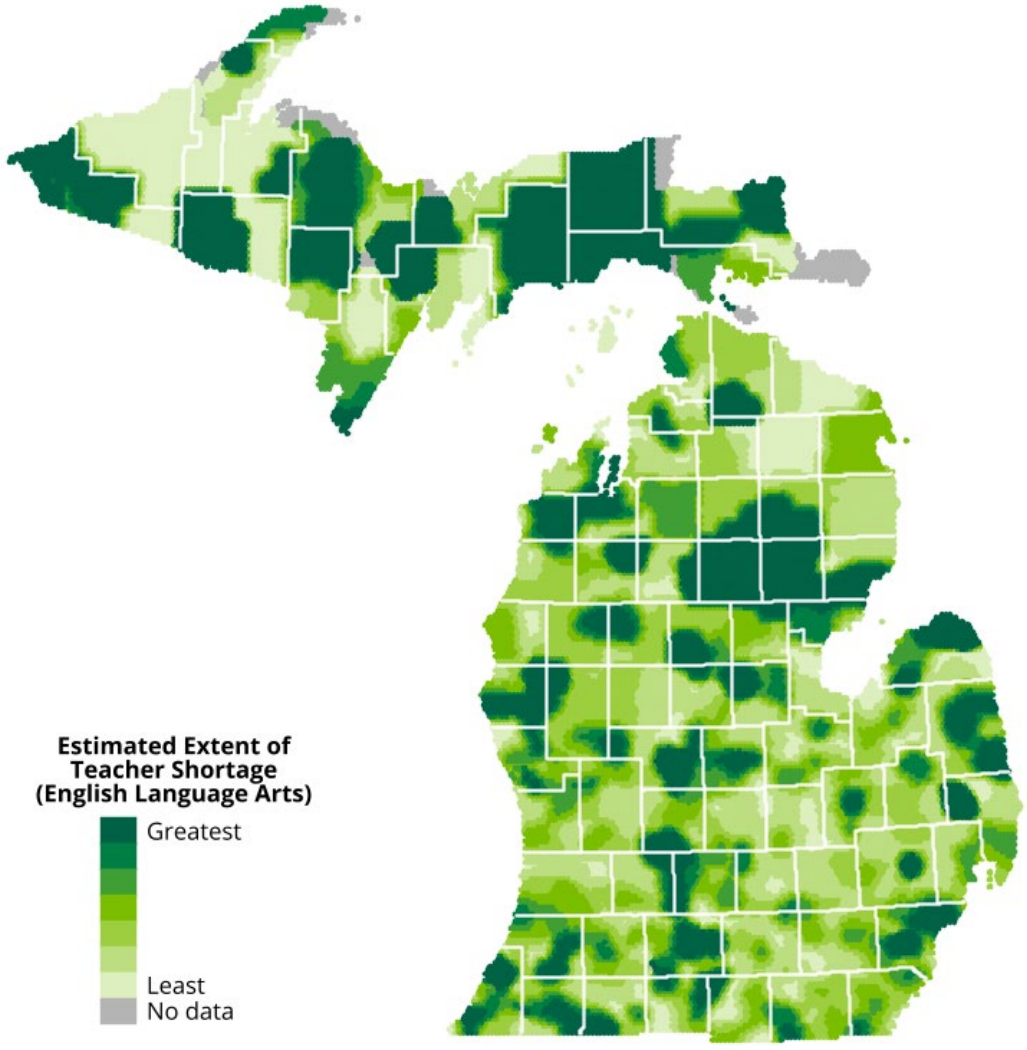
There are also areas of the state with severe shortages in some subject areas but not in others. Huron County in Michigan's "thumb" area has more severe ELA and math than science and social studies teacher shortages. The Metro Detroit region has some of the most acute elementary, ELA, math, science, and social studies teacher shortages in the state, whereas other regions face more critical special education teacher shortages.

Figure 6.3. Estimated Extent of Special Education Teacher Shortages



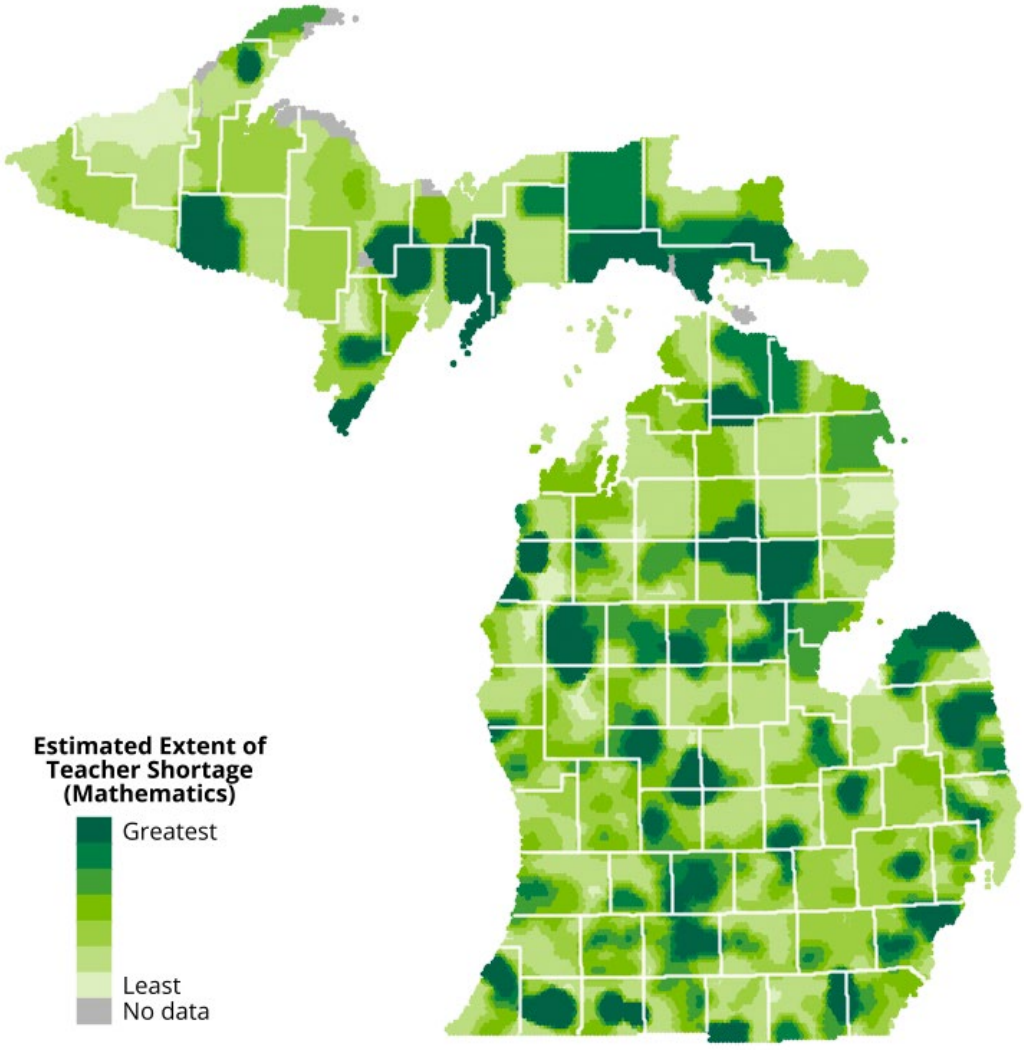
Note: The special education teacher shortage composite measure is based on within- and between-district transfer rates, shares of inexperienced teachers, shares of newly hired teachers, net changes in the number of teachers employed, shares of teachers who work in multiple schools or in multiple districts, shares of teachers who are reported as "teachers of record" for third-party virtual courses, and shares of teaching FTEs assigned to teachers without an appropriate certificate or endorsement (Cronbach's alpha=0.64).

Figure 6.4. Estimated Extent of ELA Teacher Shortages



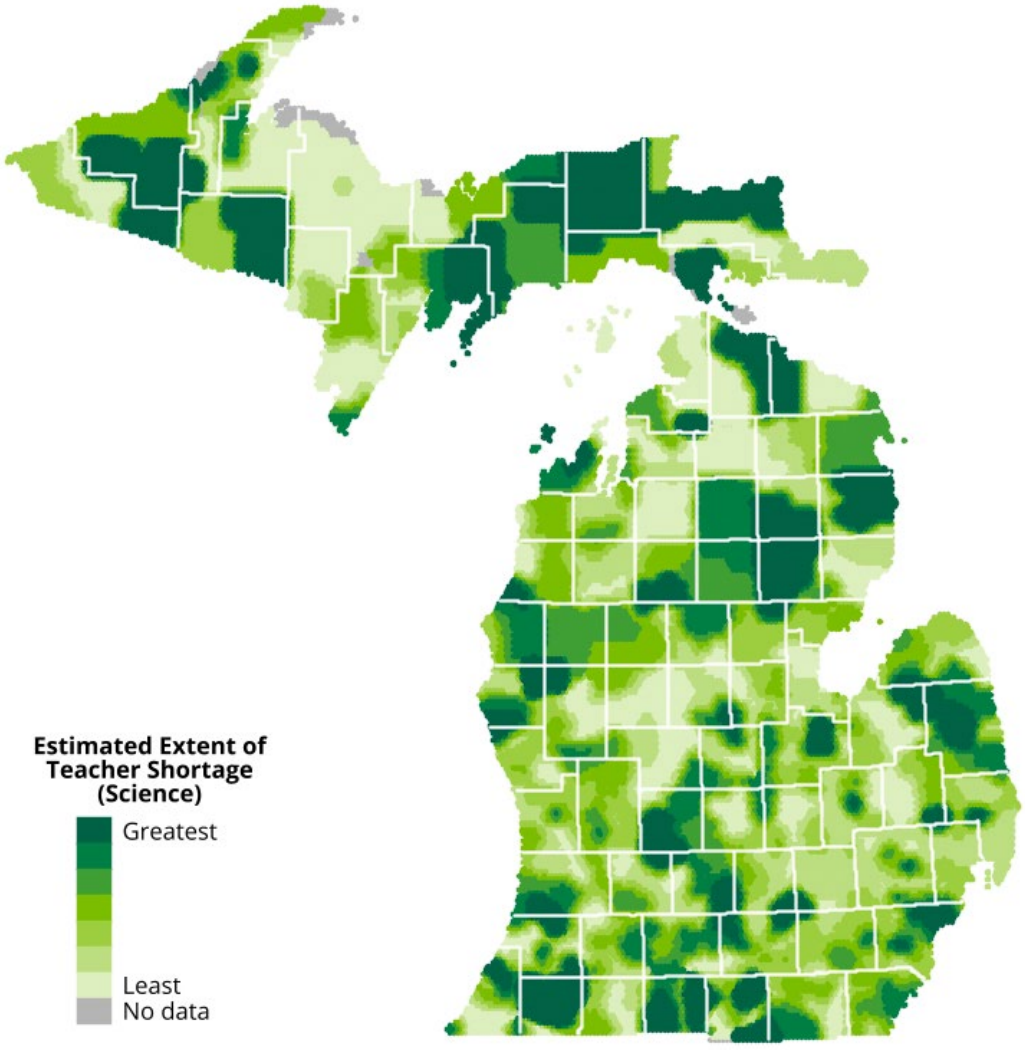
Note: The ELA teacher shortage composite measure is based on between-district transfer rates, shares of inexperienced teachers, shares of newly hired teachers, net changes in the number of teachers employed, shares of teachers who work in multiple districts, and shares of "teachers of record" and teaching FTEs assigned to teachers without an appropriate certificate or endorsement (Cronbach's alpha=0.60).

Figure 6.5. Estimated Extent of Math Teacher Shortages



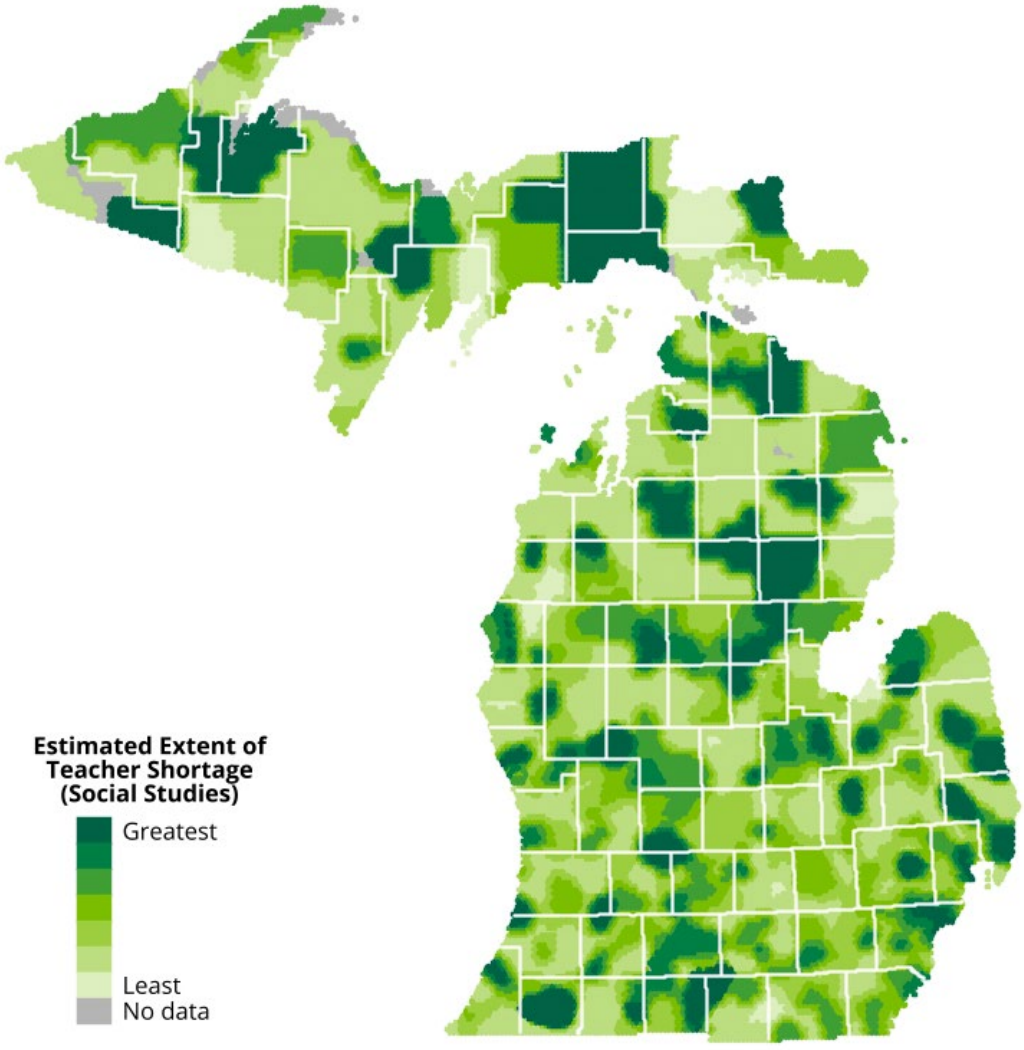
Note: The math teacher shortage composite measure is based on shares of inexperienced teachers, shares of newly hired teachers, net changes in the number of teachers employed, shares of teachers who work in multiple schools or in multiple districts, and shares of "teachers of record" and teaching FTEs assigned to teachers without an appropriate certificate or endorsement (Cronbach's alpha=0.68).

Figure 6.6. Estimated Extent of Science Teacher Shortages



Note: The science teacher shortage composite measure is based on between-district transfer rates, shares of inexperienced teachers, shares of newly hired teachers, shares of teachers who work in multiple districts, and shares of "teachers of record" and teaching FTEs assigned to teachers without an appropriate certificate or endorsement (Cronbach's alpha=0.71).

Figure 6.7. Estimated Extent of Social Studies Teacher Shortages



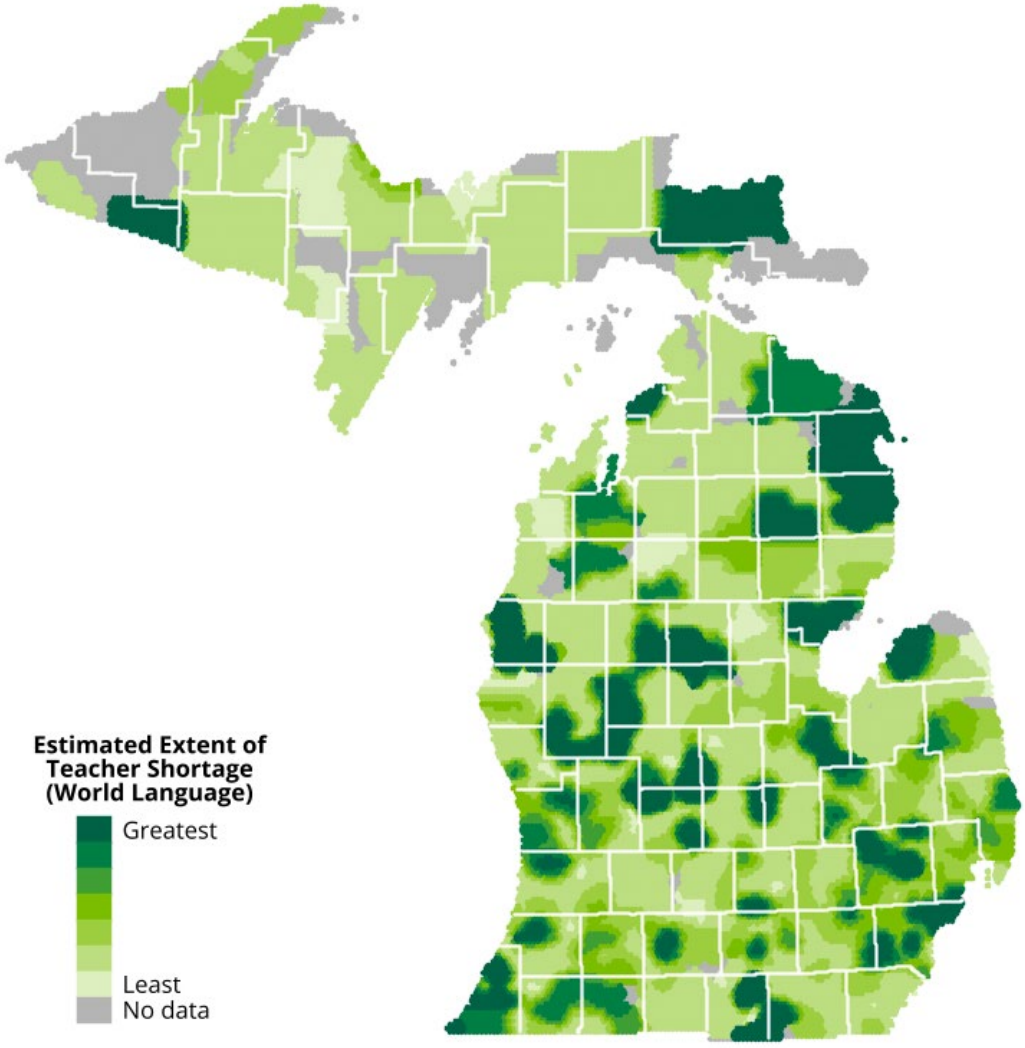
Note: The social studies teacher shortage composite measure is based on within-district transfer rates, shares of inexperienced teachers, shares of newly hired teachers, net changes in the number of teachers employed, shares of teachers who work in multiple schools or in multiple districts, shares of teachers who are reported as "teachers of record" for third-party virtual courses or have "Michigan Virtual University" teaching assignments in the REP, and shares of "teachers of record" and teaching FTEs assigned to teachers without an appropriate certificate /or endorsement (Cronbach's alpha=0.66).

World Language Teacher Shortages and Some Art and Music Teacher Shortages Are More Regional Than Local

Figure 6.8 shows the estimated extent of world language teacher shortages. The areas with the most severe world language teacher shortages are broader than those with shortages of other types of teachers, suggesting that these world language teacher shortages are more regional than localized. As we saw in Figure 5.5, new graduates

from Michigan's teacher preparation programs who specialized in world language were teaching in only a few concentrated areas in 2021-22, with no new graduates at all working as first-year world language teachers in most parts of the state. Thus, it is not surprising that there are widespread shortages affecting large geographic regions.

Figure 6.8. Estimated Extent of World Language Teacher Shortages

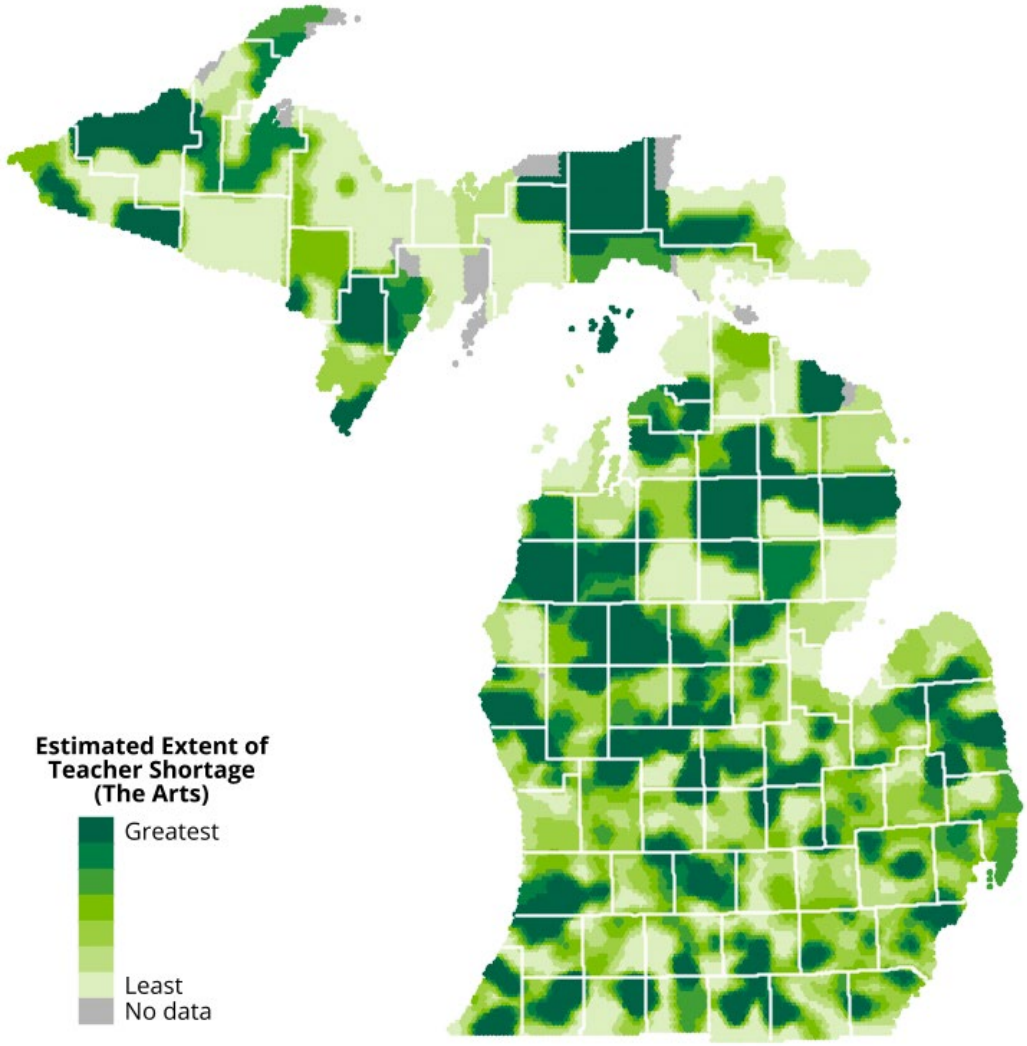


Note: The world language teacher shortage composite measure is based on between-district transfer rates, shares of inexperienced teachers, shares of newly hired teachers, net changes in the number of teachers employed, shares of teachers who work in multiple districts, shares of teachers who are reported as "teachers of record" for third-party virtual courses or have "Michigan Virtual University" teaching assignments in the REP, and shares of teaching FTEs assigned to teachers without an appropriate certificate or endorsement (Cronbach's alpha=0.57).

Figure 6.9 shows the extent of teacher shortages in the arts, which includes both visual art and music teachers. In the southern half of the state, most areas with severe shortages are small, indicating that the shortages are localized as opposed to regional.

In the northern part of the state, the areas with more severe shortages tend to be quite large. This is partially because districts in rural areas tend to cover larger geographic regions but may also suggest that the shortages in this part of the state are more widespread. These patterns align with the distribution of first-year teachers with endorsements in the arts (shown previously in Figure 5.5).

Figure 6.9. Estimated Extent of Art and Music Teacher Shortages



Note: The art and music teacher shortage composite measure is based on between-district transfer rates, shares of inexperienced teachers, shares of newly hired teachers, net changes in the number of teachers employed, shares of teachers who have "Michigan Virtual University" teaching assignments in the REP, and shares of teaching FTEs assigned to teachers without an appropriate certificate or endorsement (Cronbach's alpha=0.60).

SUMMARY

Overall, these results highlight both commonalities and discrepancies in the areas of the state that are likely experiencing severe shortages of different types of teachers. Parts of the Upper Peninsula, northeastern Michigan, the Metro Detroit area, and Michigan's "thumb" area repeatedly stand out in these composite measures of teacher shortage, suggesting that the need for teachers in these regions is particularly acute. The patterns in these maps also highlight disparities in the ways that teachers, overall and particularly for teachers of special education and science, are distributed between school districts even in the same region of the state. Many of the patterns we noted in this section align closely with the geographic distribution of teacher preparation program graduates working as first-year teachers that we showed in Section Five. This suggests that the new teachers coming out of Michigan's preparation programs are, in many cases, not ending up in the districts that need them the most.

Section Seven: Key Takeaways

This report expands on the analyses in our initial teacher shortage report to provide a more comprehensive and up-to-date assessment of teacher shortages in Michigan, to the extent possible with the available data. This section summarizes several key findings from our analyses about teacher vacancies, retention rates, teacher preparation, and geographic variation in teacher shortages. We also discuss implications of these findings for future policy decisions.

KEY FINDINGS

Available State Data Still Provide a Limited Picture of Michigan's Teacher Shortage. Improving the Data is a Long-Term Effort

Although there are several available data sources that can inform our understanding of Michigan's teacher shortage, there are no direct measures of statewide teaching vacancies or shortages. The quality, scope, and usefulness of these data have been gradually improving through ongoing efforts from state agencies and research partners. However, many recommendations we outlined in our previous report are long-term efforts that will take years and in some cases legislative action to implement.

Districts Are Relying More Each Year on Multi-Site Teachers, Third-Party Virtual Course Providers, and Teachers With Temporary Credentials to Meet Their Staffing Needs

Over the past five years, the number of teachers working in more than one district has nearly doubled and the number of teachers contracted through Michigan Virtual University has more than tripled. The number of educators each year with full-year substitute teaching permits and other types of temporary credentials has increased substantially every year. While these practices do not always signify a teacher shortage, these increases may indicate that districts are struggling to hire enough full-time, locally based, appropriately credentialed teachers to meet the needs of their students.

More Teachers Are Entering AND Exiting Michigan Schools in the Wake of the COVID-19 Pandemic

Rates of entry into the teaching profession, exit from the profession, and mobility between districts dropped far below pre-pandemic trends in 2020-21 then jumped to new highs that were *above* pre-pandemic trends in 2021-22. This may suggest that teachers delayed making major employment changes, such as starting their first teaching jobs, moving to a different district, or retiring, until after most districts resumed in-person instruction. The increase in exits from the profession, coupled with decreases in teaching certificate renewal rates, may also point to increased levels of stress and burnout for teachers during the COVID-19 pandemic.

The Number of New Teachers Becoming Certified in Michigan Has Decreased Each Year Since 2019-20

Although more teachers entered the profession in 2021-22 than in any year prior, fewer new teachers are becoming certified in Michigan. Following several years of consistent declines, the number of new teachers becoming certified in Michigan increased each year from 2016-17 through 2019-20. However, the number of newly issued Michigan teaching certificates began to decrease again after the onset of the COVID-19 pandemic; this decrease affects all grade ranges, subject areas, and educational settings.

Most Michigan Teachers Take Their First Jobs in Districts Close to Their Postsecondary Institutions, Although This Varies Widely by Program and Region

More than half of all first-year teachers from in-state teacher preparation programs taught within 30 miles of their postsecondary institutions. However, graduates' tendencies to remain within or to leave the local area for their first teaching jobs varies widely by program. Newly certified teachers from some in-state preparation programs worked almost exclusively in the local area where they went to school, while graduates from other programs were scattered throughout the state.

Teacher Shortages in Michigan Vary Widely at the Local Level, Even Between Close Neighboring Districts

Most of the variation in the extent of teacher shortages is at the local level rather than across broad regions of the state. In most regions, there are some local areas experiencing shortages to greater extents and others to much lesser extents. This is particularly true for special education and science teacher shortages in Michigan, as the areas with the most and least severe shortages in these subjects are often directly next to one another. These patterns suggest that teachers are not distributed equitably across neighboring school districts.

Teacher Shortages May be Worse for Certain Types of Districts and Teachers

Together, the data suggest that teacher shortages are not uniform across the state. Shortages are seemingly more severe for teachers of color and in urban and rural areas. In particular, new teacher supply is uneven across teachers of different races and ethnicities. Between 2020-21 and 2021-22, teaching certificate renewal and progression rates decreased for Black and Latino teachers, increased for Asian teachers, and remained about the same for White teachers. We also find evidence that certain kinds of teachers and districts face more substantial exit rates; teacher mobility and attrition rates were highest for teachers of color, early career teachers, charter schools, and teachers in districts in urban or rural areas.

IMPLICATIONS

Recent Expansions to Virtual Learning in Michigan May Obscure Trends in the Teacher Workforce Data

When interpreting trends in Michigan's teacher workforce data, it is important that stakeholders understand and account for changes in the types of teachers and teaching jobs and roles in recent years' data. School-based teachers and teachers who provide virtual instruction to students in dozens of districts through a third-party course provider have very different roles, yet often appear the same in the state employment data. While it may appear that the number of teaching positions has been increasing or that a particular district employs enough teachers to meet the needs of its students, the balance of school-based and virtual teachers may suggest differently.

A One-Size-Fits-All Solution to the Teacher Shortage May Not Be Appropriate Given Variations in Staffing Challenges by Region, Locality, and Teacher Type

It is clear that staffing has been a major challenge for school districts throughout Michigan. However, the specific challenges vary substantially in different communities and regions across the state. For example, some areas are experiencing shortages of all types of teachers while other shortages are specific to teachers with certain specializations. Some shortages are broad, affecting many districts in the same area, while others are more localized. Mobility and attrition rates are highest among teachers of color, early career teachers, charter schools, and districts in urban and rural areas. The diverse nature of these teacher shortages may warrant equally diverse policy solutions. MDE has engaged in several strategies and initiatives to support school districts in addressing the shortages in their local communities, such as grants for districts to develop grow-your-own programs, campaigns to bring former

teachers back into the classroom, and apprenticeship programs allowing teacher candidates to gain on-the-job experience.

Increasing the Statewide Supply of New Teachers May Not Be Enough to Alleviate Shortages in High-Needs Areas

Recruiting more teacher candidates into preparation programs will improve shortages in areas only where the candidates eventually choose to teach. Recruitment efforts should prioritize candidates who are from high-needs areas and therefore more likely to choose to teach in those areas, as well as preparation programs that are located near or whose graduates often go on to teach in high-needs districts. Teacher preparation programs and high-needs districts should consider partnering with one another to arrange more student teaching placements and improve candidates' student teaching experiences, which may lead to more graduates teaching in those districts after they complete their programs.

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Endnotes

[1] For their K-12 Virtual Learning Effectiveness Reports, Michigan Virtual compiled lists of course title keywords that reference Michigan Virtual, other third-party virtual course providers like Edmentum and Edison Learning. We identify "third-party virtual courses" in the TSDL data based on whether the local course titles contain any of the keywords on these two lists. As Michigan Virtual researchers note in their reports, this method does not perfectly identify all third-party virtual courses. However, because Michigan Virtual is the only third-party provider with its own building and district codes in the EEM, the course title keywords are currently the only way we can identify other third-party providers in the data.

[2] See CEPI's Student Enrollment Counts Report, Statewide, All Grades K-12, All Students (2012-13 to 2021-22). https://www.mischooldata.org/student-enrollment-counts-report.

[3] Following expansions to student access to virtual learning options in 2017 (2017 PA 143), CEPI established a building code and a district code for Michigan Virtual University in advance of the fall 2017 reporting period. Prior to 2017-18, there are no entity codes or indicators in the REP data that would allow us to identify MVU teachers.

[4] Michigan Virtual provides ready-to-submit REP data files to districts upon request to assist them in meeting the reporting requirements for MVU teachers that provide instruction to students in their district. If Michigan Virtual changed any of their reporting practices (e.g., if they began using the "permanently filled" funded position status code in situations where they previously would have used the "vacancy assigned to temporary employee" code), these changes would affect all districts that submitted MVU-prepared REP data. See https://help.michiganvirtual.org/support/solutions/articles/65000174987-request-cepi-rep-npspr-report.

[5] This does not include the 600-700 teachers each year who are reported in the REP without a specific school building assignment, many of whom likely work in multiple schools.

[6] This only includes TSDL courses with known references to common third-party providers in their course titles and may sometimes include teachers who facilitate a third-party virtual course for students in their local district in addition to the virtual teacher who is responsible for providing instruction.

[7] Due to the low amount of variation in districts' percentages of MVU teachers, we do not include a separate figure for MVU teachers.

[8] The "never employed" group likely includes people who taught in private schools, taught in another state, worked in a non-teaching role within Michigan's public school system, and people who chose to use their credentials for something other than classroom teaching.

[9] Although teachers whose certificates expired in 2020-21 would not have qualified for professional learning waivers through the Welcome Back Proud Michigan Educators Campaign, messaging associated with the campaign may have helped to encourage some of these teachers

to return to the classroom. See https://www.michigan.gov/mde/-/media/Project/Websites/mde/educator_services/cert/welcome_back_pme/chart_of_welcome_back_pme_waiver_options.pdf for details about the waivers and eligibility criteria.

[10] Last year's report also showed that recertification rates for Black, Latino, and Asian teachers were higher than those for White teachers in 2012-13 but declined each year and eventually fell below the rate for White teachers by 2016-17. At that time, some educators did not have self-reported race/ethnicity information available in the researcher datasets. CEPI has since incorporated additional district-reported demographic data to fill in gaps for many of the educators who did not report their own race/ethnicity in MOECS. These are mostly educators who earned their teaching certificates before 2011 (which is the year MOECS was established) and have never renewed or progressed their certificates in MOECS. Using the improved data, we no longer see the same decline in recertification rates for teachers of color.

[11] According to the 2021 Title II Report, there are 33 university-based teacher preparation providers in Michigan, but only 27 providers had at least 10 teacher preparation program graduates who worked as first-year teachers in a Michigan public school in 2021-22. We include graduates from both traditional and alternative route programs in our analyses. Two of the 27 providers in our analysis offer alternative route programs only, while 23 offer traditional route programs only, and the remaining two offer both traditional and alternative route programs.

[12] The exact indicators in each composite teacher shortage measure differ slightly between the overall and various subject-specific measures. This is because, before creating the composite measures, we complete an iterative Cronbach's alpha analysis to ensure that all indicators capture information about the same underlying construct. We exclude indicators that do not align sufficiently with the other indicators in the composite measure. We found that some indicators, such as within-district transfer rates, shares of teachers who work in multiple schools, and reliance on third-party virtual course providers, align with other shortage indicators for some subject areas but not for others. Please see the notes below each figure in this section for a full list of the indicators we included in the composite measure, as well as its internal consistency reliability coefficient.

[13] The grey portions of each map indicate that the district(s) in those areas did not have data available for one or more of the indicators that we included in the composite measure, preventing us from estimating the extent of the shortage in that area. These grey areas are much more prevalent in the subject area maps than in the overall map, as some districts either did not report any teachers with assignments in certain subject areas and some relied entirely on multi-site or virtual teachers that could not be tied to a single location for mobility calculations.

[14] As part of the Regional Prosperity Initiative, the state grouped Michigan's counties into 10 "prosperity regions." We refer to these regions to help describe geographic patterns in teacher shortages throughout Michigan.