Study of the Individualized Education Program (IEP) Process and the Adequate Funding Level for Students with Disabilities in Maryland

A Research Study by WestEd

Jason Willis, Sara Menlove Doutre, & Alex Berg Jacobson
WestEd

December 2019

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MARYLAND STATE DEPARTMENT OF EDUCATION
EQUITY AND EXCELLENCE

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WestEd is a nonpartisan, nonprofit research, development, and service agency that works with education and other communities throughout the United States and abroad to promote excellence, achieve equity, and improve learning for children, youth, and adults. WestEd has more than a dozen offices nationwide, from Massachusetts, Vermont, Georgia, and Washington, DC, to Arizona and California, with headquarters in San Francisco.

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Executive summary

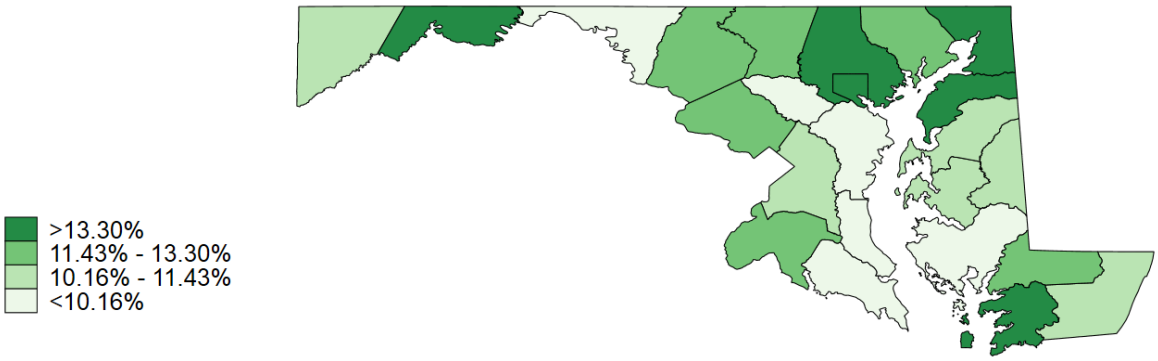
The Maryland State Department of Education (MSDE) contracted WestEd to conduct a study regarding program quality and adequate funding levels for students with disabilities comprising three components: (1) an assessment of MSDE technical assistance for local school systems and public agencies (LSS/PAs) and the Maryland IEP process; (2) a description of current Maryland special education revenue, expenditure, and staffing patterns and a review of international and national best practices; and (3) recommendations on the cost to establish adequate funding for special education. The researchers used a mixed-methods approach, blending qualitative and quantitative data to answer a series of research questions.

Students with disabilities in Maryland

In the 2017–18 school year, Maryland public schools[1] served 97,233 students with IEPs in grades K–12, 5.5% more than the number of students served in the 2013–14 school year, maintaining roughly the same proportion of the total student population. This map shows the proportion of students with disabilities served by each LSS during the 2017–18 school year.

[1] Includes LSSs and the SEED school. Other public agencies are not included.

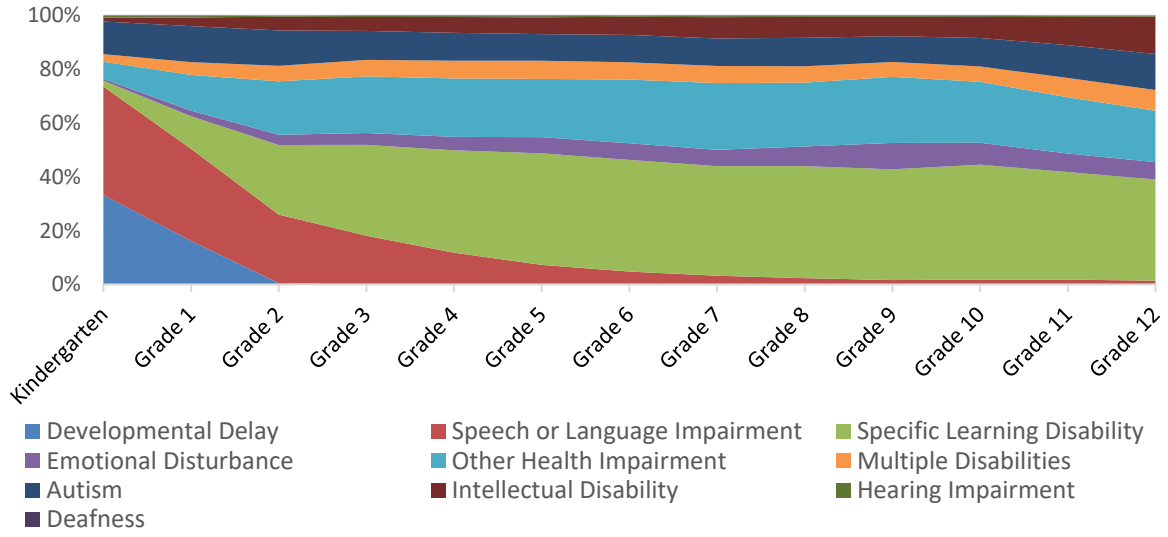
Exhibit E-1. Map of LSS Percent of Students with IEPs, 2017–18



Source: MSDE, End-of-Year Attendance Files, SY 2014–2018.

Maryland LSSs serve children in a broad range of disability categories that shift over the span of students' enrollment between kindergarten and 12th grade. The chart below displays students' disability categories for kindergarten through 12th grade across all LSSs with a band for percentage enrollment in each disability category in 2017–18.

Exhibit E-2. Students in Special Education by Grade and Type of Disability, K–12, 2017–18

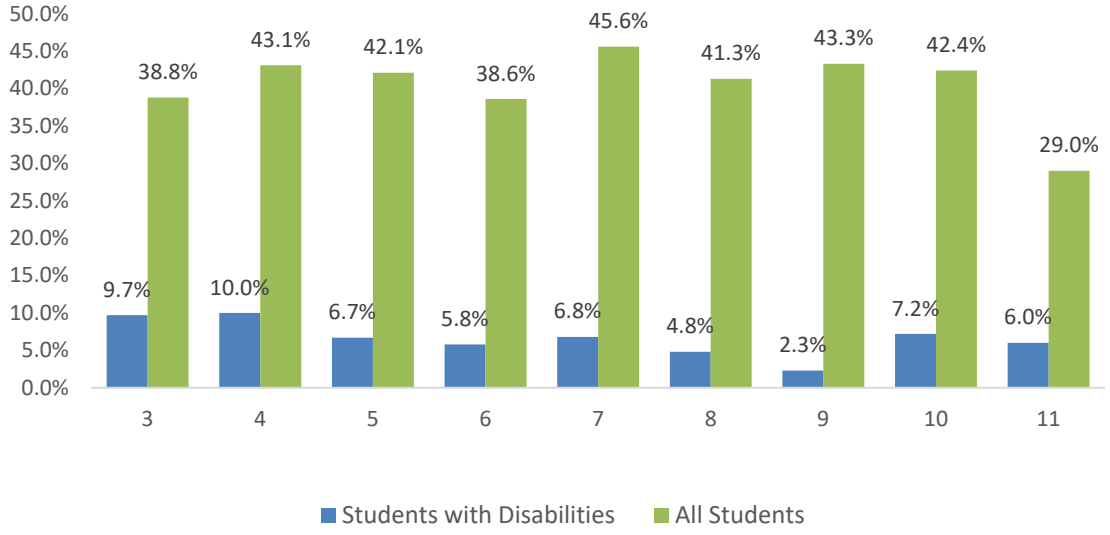


Sources: MSDE, Maryland Online Individualized Education Program (MOIEP) Data, SY 2015–2019; Baltimore County Public Schools, Online Individualized Education Program (OIEP) Data, 2017–18 school year; Anne Arundel County Public Schools, OIEP Data, 2017–18 school year; Howard County Public Schools, OIEP Data, 2017–18 school year; Wicomico County Public Schools, OIEP Data, 2017–18 school year.

MSDE Goals and Priorities (Section 1.1)

Maryland has made significant progress in providing students with disabilities access to the general education classroom and curriculum; more than 70% of students with disabilities spend most of the day in a general education classroom compared to 60% in 2015.[2] However, Maryland students with disabilities continue to lag behind their peers in academic achievement and in graduation rates. For example, the graph below shows 2017–18 statewide English language arts assessment data, in percent proficient, for students with disabilities on the left compared with all students on the right; the data illustrates the large achievement gap, persistent across grades.

Exhibit E-3. 2017–18 Statewide English Language Arts Assessment, Percent Proficient



Source: 2019 Maryland State Schools at a Glance https://reportcard.msde.maryland.gov/Graphs/#/Assessments/ElaPerformance

The MSDE's Division of Early Intervention and Special Education Services' (DEI/SES's) strategic plan, *Moving Maryland Forward: Sharpen the Focus for 2020,* outlines the state's approach and areas of focus for improving special education in the state through its LSS/PAs. The plan describes the MSDE's differentiated framework focusing on the three action imperatives to ultimately narrow the gap between students with disabilities and their peers: early childhood; access, equity, and progress; and secondary transition. Based on research, the MSDE identified implementation strategies and measures of success for each imperative grouped into five key areas: strategic collaboration, family partnerships, evidence-based practices, data-informed decisions, and professional learning.

[2] Maryland Annual Performance Report, Indicator 5 (MSDE, 2019).

Funding and staffing for students with disabilities in Maryland (Section 2.1)

In fiscal year 2017–18, the state of Maryland and its LSSs spent $1.471 billion ($14,356 per student) to support students with disabilities. A large proportion of special education spending in Maryland, 77.4%, is dedicated to salaries and wages.

Study Conclusions and Recommendations

Recommended investments

Based on analysis of spending in 2016–17 and 2017–18, the study concludes with the results of the state weights study (Section 2.4), results of the cost function study (Section 2.5), and the resulting recommendations (Section 2.6) to create adequacy and improve outcomes for students with disabilities. The study results recommend Maryland increase its investment in students with disabilities in two ways.

Short-term investment to supplement special education for students with disabilities

First, Maryland should make a series of short-term investments, totaling approximately $2.0 billion over ten years, to provide supplemental interventions to students with or at risk for disabilities to close the achievement gap between them and all students. These supplemental interventions go beyond special education and, when implemented as described in Recommendation 2.6.1, will not impact the state's or LSS's maintenance of effort requirement. This table details how the researchers recommend the state implement the short-term investments to reach $2 billion over ten years.

Exhibit E-4. Amounts of Short-Term Investment, by Year

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Short-term investment	$52M	$152M	$227M	$277M	$277M	$277M	$277M	$277M	$152M	$51M

Weighted allocation of increased ongoing resources to local school systems

Second, the cost study function requires an **increased ongoing investment in special education of approximately $75.4 million per year** to ensure each student with a disability makes adequate progress, in light of their unique circumstances. The increased ongoing investment will support maintenance of and higher achievement for students with disabilities. Exhibit E-5 displays the amount of the increased ongoing investment to be added to the state's existing ongoing investment in special education.

Exhibit E-5. Amounts of Ongoing Investment, by Year

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Ongoing investment	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M

All ongoing allocations should be differentiated for better results. The study found that students with disabilities will have better academic and functional outcomes when funding is differentiated to account for the differences in students' needs. Differentiating revenue by disability category leads to higher numeracy outcomes and improved social-emotional development (Conclusion 2.4.1). However, differentiating on disability categories alone does not account for the observable and variable academic needs of students within disability categories on the basis of reading and writing (Conclusion 2.5.3).

The study results predict the greatest benefit from weighting the allocation of state funds for special education and related services to LSSs by: (1) their identified disability category (grouped according to cost); (2) their academic needs in the areas of reading, math, and writing; and (3) the concentrations of students with disabilities. This proportion of need is based on a statewide analysis of the needs identified, drawn from the IEP data of students in every LSS from across the state, over three years (Conclusion 2.5.4).

Exhibit E-6. Proposed Weights to Be Used in Maryland's Funding Formula for Students with Disabilities

Proposed Weight Displayed by Summary Disability Category Including Need Factor	Weight
Highest Cost (Orthopedic Impairment, Traumatic Brain Injury)	2.8504
High Cost (Emotional Disability, Hearing Impairment/Deaf/Deaf-Blind)	1.4846
Medium Cost (Autism, Developmental Delay, Intellectual Disability, Speech or Language Impairment)	1.2926
Low Cost (Specific Learning Disability, Other Health Impairment, Visual Impairment, Multiple Disabilities)	1.1426

The recommended weightings are a statistically significant model for increasing academic and functional outcomes for students with disabilities if additional funds are used to support evidence-based practices, including high-quality general education instruction. In addition to these changes, the study also recommends similar increases for students with disabilities served in public agencies.

Implementation and monitoring

The state of Maryland and, specifically, the MSDE must sequence and monitor the investment of those additional dollars in the system over 10 years, prioritizing a small number of foundational, high-impact investments to ensure the increased investments are effectively used by LSSs and schools. The DEI/SES Strategic Plan and Section 2.6 provide a recommended framework for implementing and measuring the effectiveness of evidence-based strategies. The MSDE DEI/SES has provided high-quality guidance on evidence-based practices for teaching and learning (Conclusion 1.1.3) and should continue to improve the use of these practices in the field by developing strategies to bridge policy and practice to support broad and deep implementation with fidelity.

The MSDE DEI/SES has prioritized and successfully increased the proportion of children with disabilities placed in the regular education classroom for the majority of the school day (Conclusion 1.1.2). The MSDE DEI/SES will need to improve its technical assistance to support these students in accessing the general education curriculum by coordinating more technical assistance across its divisions. Because most students with disabilities are in the general education classroom, and because the short-term supplemental interventions are provided in addition to the services on students' IEPs, it is essential that the DEI/SES partners with other divisions to model and provide the coordinated support that is necessary at all levels. General education teachers need additional training on how to effectively participate in the IEP development process and implement the IEP effectively (Conclusion 1.1.4).

The MSDE DEI/SES currently has a robust system of technical assistance that provides useful support to LSS/PAs to improve results for children with disabilities (Conclusion 1.1.1). To increase the effectiveness of its technical assistance, the MSDE should continue to further differentiate support to LSSs. The report provides multiple recommendations for how the DEI/SES can differentiate support, including streamlining the annual application and reporting processes to require fewer and prioritized indicators for LSS/PAs which demonstrate progress against the measures in the Strategic Plan or other measures of improving outcomes for students with disabilities. Such streamlining could include a simplified Local Improvement Results (LIR) application for LSS/PAs that met their implementation goals in the previous year.

Interaction with recommendations made by the Kirwan Commission

Although the scope of this study did not include predicting the impact and interaction between the study's recommendations and a redesigned education system based on the Kirwan Commission, the researchers recognize the ongoing and dynamic nature of improving state and local education systems and the benefit to state decisionmakers of considering the overlap of these recommendations with recommendations made by the Kirwan Commission.

As discussed in detail in Conclusion 2.6.6, there is an overlap between the short-term and ongoing recommendations in this report and the Kirwan Commission recommendations for Transitional Supplement Instruction (TSI) designed to provide resources for students not currently attaining proficiency on statewide assessments, along with changes in allocations for students with disabilities. Initial analysis would suggest that for the short-term funding recommendation in this study and the TSI allocation recommended by the Kirwan Commission there is up to an approximately $45 million average annual overlap (this amount varies by year). The researchers recommend the state further study the

interaction and the amount by which the short-term investments recommended in this study might be ratably reduced. Many of the other recommendations may also reasonably increase outcomes for students with disabilities. The researchers recommend the ongoing investment not be reduced prior to the state observing a change in either the number or needs of students with disabilities.

Acknowledgements

This investigation represented an opportunity to document and study students with disabilities in Maryland, their services and associated costs in an unprecedented way. It took the dedication and support of numerous individuals and other organizations that we think should be recognized.

WestEd would like to extend its sincere gratitude to all members of the research team from the agency including Amanda Allen, Katherine Bradley Black, Paula Burdette, Ruthie Caparas, Roseanne Collins, Marcelina Contreras, Cecelia Dodge, Rorie Fitzpatrick, Cheryl La France, Ryan Miskel, Liza Morris, Joseph Mosley, Kate Nagle, Nancy O'Hara, Tye Ripma, Michele Rovins, Stephen Ruffini, Mari Shikuzawa, Sean Tanner, and Emily Vislosky.

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Introduction and purpose

The Maryland State Department of Education (MSDE) sought an independent research agency to conduct a study about the state's individualized education program (IEP) process and the adequate funding level for students with disabilities. *The Study of the Individualized Education Program (IEP) Process and the Adequate Funding Level for Students with Disabilities in Maryland* (the study) is mandated by bills enacted by the Maryland General Assembly: Chapter 715, Acts of 2017 (House Bill 1240, 2017 Legislative Session), as amended by Chapter 361, Acts of 2018 (House Bill 1415, 2018 Legislative Session). These acts, as amended, require MSDE to contract with a public or private entity for the purpose of conducting a comprehensive, independent study of the IEP process in the state of Maryland, including the procedures relating to the identification, evaluation, and educational placement of a child; the provision of a free and appropriate education; and the dispute resolution procedures provided under §8–413 of the Education Article. In addition, the study must include a review of the methodology that top-performing counties and other states use to estimate the cost of providing an adequate education to students with disabilities in special education. The study must also result in a recommendation regarding the appropriate level of funding for students in Maryland who receive special education services and any weights that may correspond to the recommended funding level. MSDE is required to report conclusions and recommendations from the study to the governor and the General Assembly by December 1, 2019. This report, comprises two chapters, addresses each topic associated with the broader aims of the investigation described above.

Reporting requirements for the study

This report consolidates the three required reports under the requirements of this study into two chapters. Each chapter and section contain conclusions and recommendations about the MSDE Division of Early Intervention and Special Education Services (DEI/SES) and Local School System and public agency (LSS/PA) policies, procedures, and practices. The conclusions and recommendations from each chapter complement each other and the researchers made multiple connections between the programmatic and fiscal conclusions and recommendations.

Chapter 1. MSDE technical assistance and the IEP process

Report on MSDE technical assistance and the IEP process. Review of the programmatic and parent engagement components of the state's special education program, including MSDE technical assistance. This section of the report focuses on how LSS/PAs utilize technical assistance provided by MSDE including technical assistance specifically provided to assist parents in understanding their rights and responsibilities in the IEP process, based on the MSDE Division of Early Intervention and Special Education Services' (DEI/SES's) strategic plan, *Moving Maryland Forward: Sharpen the Focus for 2020* (the Strategic Plan).

In accordance with contract requirements, the report assesses:

- How LSS/PAs utilize MSDE technical assistance based on the MSDE DEI/SES Strategic Plan; and

- MSDE's technical assistance to LSS/PAs to assist parents in understanding their rights and responsibilities in the IEP process.

The report provides:

- Recommendations for clarifying and simplifying the IEP process to enable parents and guardians to more easily understand their rights and responsibilities in the process;
- Recommendations for modifying the administrative goals, objectives, and strategies of teachers and IEP teams to make them more efficient and cost effective in their delivery of services to students with disabilities, including potential reductions in caseloads and recordkeeping; and
- Best practices gleaned from the evaluation of current practices utilized by MSDE staff, LSS/PA staff, and other State Agency staff as part of the IEP process in the state, particularly in the areas of early childhood; access, equity, and progress; and secondary transition.

Chapter 2. Special education funding in Maryland and the cost to establish adequacy of funding for students with disabilities

Report on current special education revenue, expenditure, and staff patterns, including review of international and national best practices: Descriptive statistics, analysis, and pattern identification focused on how the state and its LSS/PAs receive funding, expend those resources on activities, and invest in staff to serve students who receive special education services.

This report focuses on how all LSS/PAs including Maryland School for the Blind, Maryland School for the Deaf, the School for Educational Evolution and Development (SEED School), and the Juvenile Services Education System (JSES) schools spend their special education funds and allocate their teaching and family support services staff. This report also assesses the effectiveness of special education family support services provided by LSS/PA staff members.

In accordance with contract requirements, the report assesses

- How all state public school systems and other identified schools spend their special education funds and allocate their teaching and family support services staff; and
- The effectiveness of special education family support services provided by LSS/PA staff members.

The report provides:

- Recommendations for ensuring that LSS/PAs are effectively allocating their teaching and family support services staff to improve the education achievement of students with disabilities; and
- Best practices for retaining special education teachers.

Report on the cost to establish adequacy of funding in special education: The research base, methodology, analytical decisions, findings, and implications for studying the cost to establish adequacy

of funding in special education for the state. Further, this report will summarize international and national best practices that may be applicable to the context and circumstances of the state.

This report focuses on the cost to establish adequacy of funding in special education for the state of Maryland. Several complementary analyses, including a review of national and international practices, supplement the primary research of this report.

This report includes:

- A review of international and national data and studies of the current costs of special education across the spectrum of disabilities and levels of severity and the methodologies used by top-performing countries and by states to estimate the cost of providing an adequate education to students with disabilities.
- A review of weights used by states, including single or multiple weights, weights based on individual or clusters of disability categories, or a weight based on levels of severity in various disability categories.

This report recommends an appropriate level of funding that is adequate for students with disabilities in Maryland using the context of the primary and secondary education formulas, and for any weight or weights that correspond with the recommended level of funding for students in special education within the formulas.

Maryland's Special Education System

This section of the report provides an overarching framework for understanding Maryland's special education system.

Maryland context: State and local roles

It is important to understand the role of the DEI/SES as the state education agency (SEA) and the role of the LSS/PA as the implementer. IDEA clearly delineates different responsibilities for the education of students with disabilities. Each local education agency — in Maryland, each LSS/PA — is required to provide a free and appropriate public education to each eligible student and is responsible for implementing the IEP process. In addition to the requirements for local education agencies, IDEA requires that each state have a comprehensive general supervision system in place, and that the primary focus of the state's activities must be on "(1) Improving educational results and functional outcomes for all children with disabilities; and (2) Ensuring that public agencies meet the program requirements under Part B of the Act, with a particular emphasis on those requirements that are most closely related to improving educational results for children with disabilities" (34 CFR §300.600(b), IDEA, 2014).

The mission of the DEI/SES reflects these requirements stating their commitment to "provide leadership, accountability, technical assistance, and resource management to LSS/PAs and stakeholders through a seamless, comprehensive system of coordinated services to children and students with disabilities, birth through 21, and their families" (MSDE, 2019). As reported in its Annual Performance Report to the United States Department of Education (MSDE, 2019), the DEI/SES organizational structure is based upon principles of collaboration and shared responsibility with its LSS/PAs.

The shared responsibility between MSDE and LSS/PAs for improved results for students with disabilities in Maryland is further outlined in the Strategic Plan (DEI/SES, 2016), which is both comprehensive and ambitious. The main focus of the Strategic Plan is to narrow the gaps present for students receiving special education in Maryland. The Strategic Plan describes a statewide differentiated framework to focus on the three action imperatives to ultimately narrow the gap: early childhood; access, equity, and progress; and secondary transition.

For each imperative, the Strategic Plan lays out measures of success and implementation strategies grouped into five key areas to improve results for children and youth with disabilities and their families:

- *Strategic collaboration:* The DEI/SES will employ strategic collaboration with partners across State agencies, across divisions within the MSDE, among public education agencies, with institutes of higher education, and with families, advocates and community partners, in order to promote access for all children to high-quality teaching and learning.
- *Family partnerships:* The DEI/SES will create and sustain strong family partnerships and will support school and community personnel in their efforts to encourage families, as their child's first teacher, to make active and informed decisions that contribute to their child's success.

- *Evidence-based practices:* The DEI/SES will promote the adoption and implementation with fidelity of evidence-based practices to narrow school readiness and achievement gaps. The DEI/SES will identify and share evidenced-based practices, including an integrated tiered system of academic and behavioral supports, to ensure equitable access to high-quality instruction that leads to student progress.
- *Data-informed decisions:* The DEI/SES will increase the capacity to make data-informed decisions at the state and local levels by providing real-time student data (including formative and summative assessments as well as observational and anecdotal documentation). The DEI/SES will support the implementation of an evidence-based and customized data analysis and decision-making process.
- *Professional learning*: The DEI/SES will provide professional learning to promote effective early care and education providers, teachers of students with disabilities, related service providers, paraprofessionals, and leaders. The DEI/SES will use ongoing, collaborative learning communities, reflective coaching models, online tools, and guidance on evidence-based practices to engage stakeholders in transforming the skills, knowledge, and beliefs of all individuals who impact the life of a child.

  (DEI/SES, 2016, p. 11).

The DEI/SES' general supervision system is also aligned to these priority imperatives and key strategies, making it an excellent analytical framework for this study. The ability to implement the Strategic Plan and general supervision system is aided by a robust data system. The DEI/SES has prioritized implementation of a statewide data system that provides quantitative and qualitative information for making data-informed decisions about program management and improvement. In addition to a robust statewide student data collection system, the DEI/SES collects and reviews additional data to ensure its LSSs are implementing IDEA, including: a comprehensive monitoring procedure that includes data verifications, desk audits, onsite monitoring, interviews, and observations; reviews of fiscal procedures and associated data; and data from a formal dispute resolution system accessed by parents.

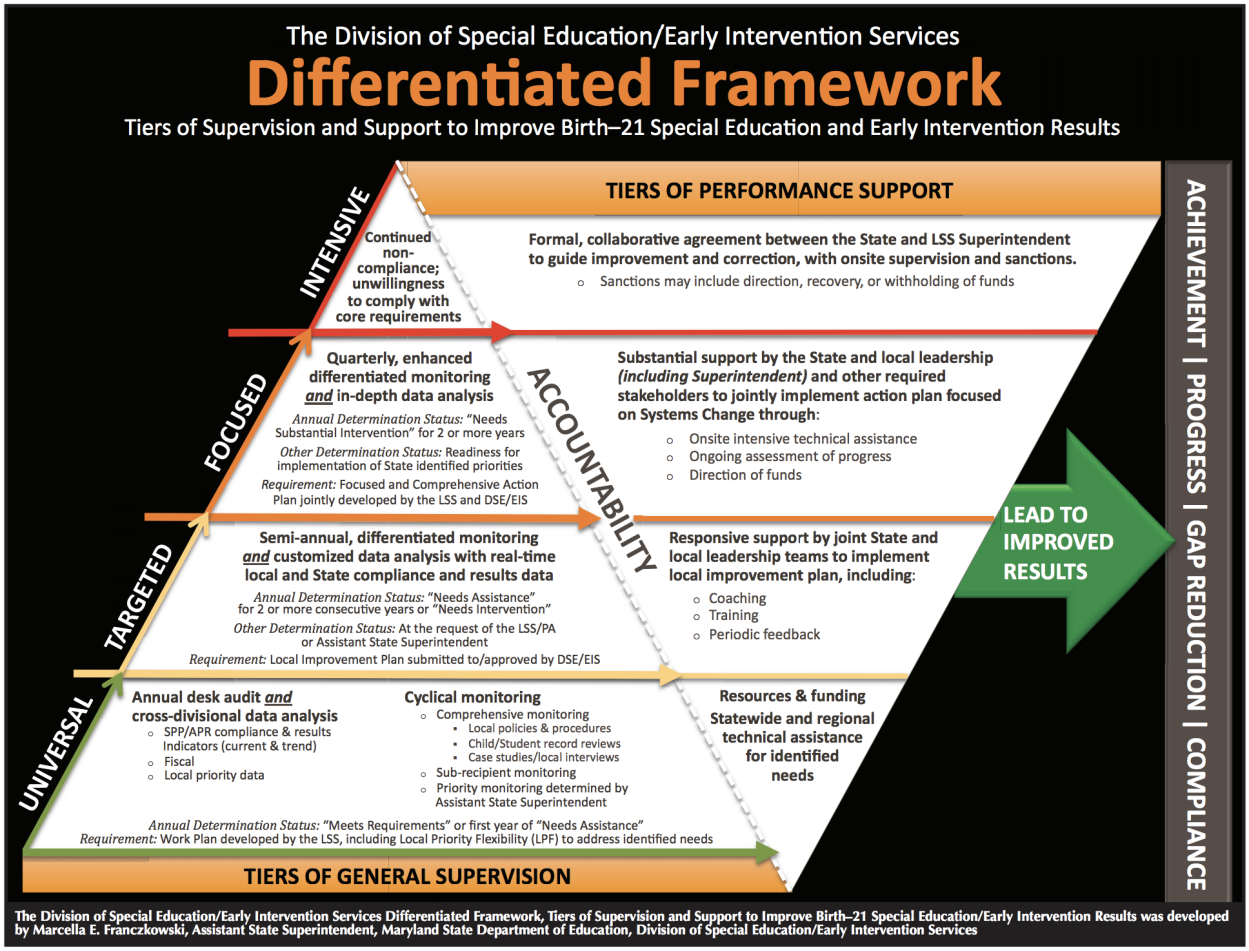
Of particular relevance to the conclusions of this report, the imperative on access, equity, and progress supports LSS/PAs to implement evidence-based curricula aligned with state standards using the principles of Universal Design for Learning, described later, and implementation of evidence-based curricula with fidelity. The critical elements to achieving this imperative, as laid out in the Strategic Plan, include strategic collaboration, family partnerships, evidence-based practices, data-informed decision-making, and professional learning (DEI/SES, 2016, pp. 16–17).

Differentiated framework

Reflecting an increased focus from the federal government on improving results for students — or results driven accountability — and further illustrating the shared responsibilities of the DEI/SES and LSS/PAs, the DEI/SES initiated a data-driven framework for differentiating support to LSS/PAs. The differentiated framework, found on p. 12 of the Strategic Plan (DEI/SES, 2016) and shown in Exhibit 1

below, outlines four tiers with increasing levels of support and monitoring for the DEI/SES to work with LSS/PAs, through both general supervision and performance support. Further details describing how technical assistance is provided through the differentiated framework is included in Section 1.1 of this report titled "How LSS/PAs utilize MSDE technical assistance based on the MSDE DEI/SES Strategic Plan, *Moving Maryland Forward: Sharpen the Focus for 2020*. "

Exhibit 1. The Division of Special Education/Early Intervention Services Differentiated Framework, Tiers of Supervision and Support to Improve Birth–21 Special Education/Early Intervention Results (View Readable Graphic at http://marylandpublicschools.org/programs/Documents/Special-Ed/DSEEISStrategicPlan2016.pdf)



The DEI/SES' Strategic Plan and general supervision system provide a framework for understanding how the Maryland education system is structured and the role of MSDE in supporting and ensuring implementation of IDEA requirements as well as evidence-based practices for improving results for students with disabilities at the local level.

The differentiated framework depicts integrated tiers of performance support and accountability that are provided to LSS/PAs, and that are designed to lead to improved results. In addition, the DEI/SES has a data-informed decision-making tool that LSS/PAs are required to use for all work on Strategic Plan imperatives. For each imperative, LSS/PAs must outline the family partnerships that will help them narrow the gaps in each particular goal area. The use of these tools and plans by the DEI/SES and LSS/PAs is further explored in Chapter 1 of this report.

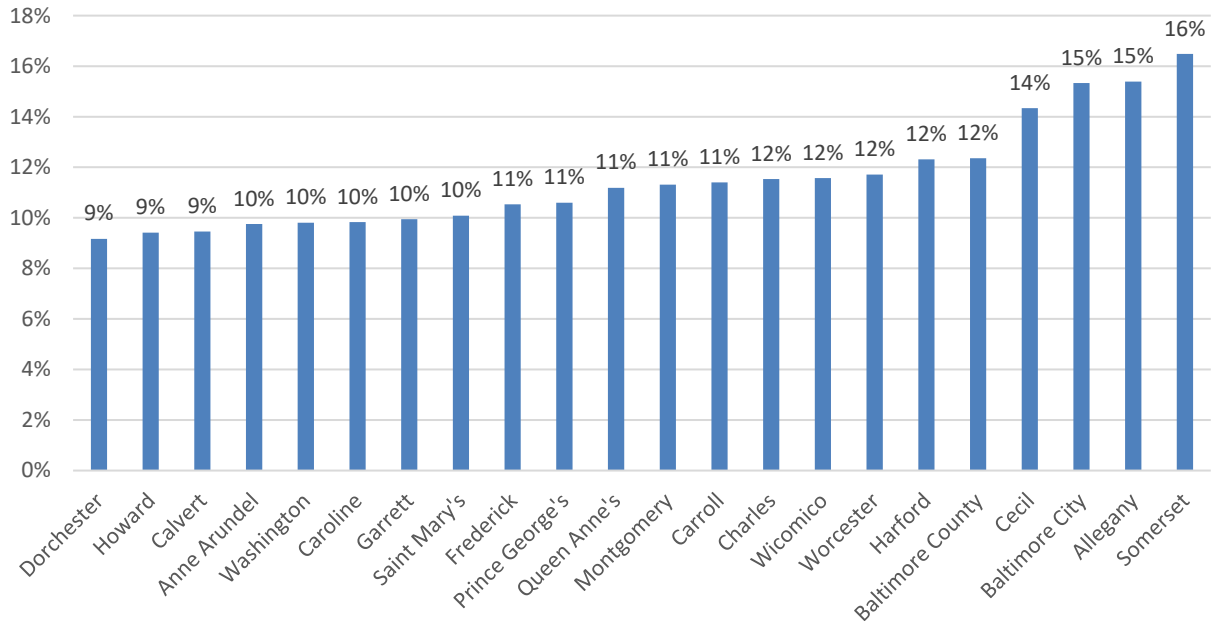
Maryland context: Profile of students receiving special education services

This section of the report provides descriptive statistics on the state's current population of students with disabilities, including overall existing resource investment, and how staff are allocated in the aggregate to serve these student populations. This information sets the context for the researchers' conclusions provided later in this report.

Student count and demographics

In the 2017–18 school year, Maryland served 97,233 students with IEPs in grades K–12. This is 5.5% more than the number of students who were served five years prior, in the 2012–13 school year. Across those five years, the state has maintained roughly the same proportion of the total student population it serves. In the 2017–18 school year, 11.3% of the student population had IEPs, compared with 11.0% in the 2012–13 school year. That is a difference of 5,086 students. Although the overall statewide proportion of students is 11.3%, there is variation in the proportion of students with disabilities served across LSSs. As Exhibit 2 shows, the proportions of LSSs' overall student population with IEPs ranged from a low of 8.5% in Calvert to a high of 15.9% in Baltimore City.

Exhibit 2. Maryland School Districts' Percentages of Students in Special Education, Grades K–12, Lowest to Highest Proportion of Total Enrollment, 2017-18



Source: MSDE, End-of-Year Attendance Files, SY 2014–2018.

As shown in Exhibit 2, the majority of LSSs (58%) have proportions of students receiving special education that are 11% or less of their overall student populations. However, there is a subset of LSSs whose proportions are 14% or higher, including the SEED School, Cecil, Kent, Allegany, Somerset, and Baltimore City. It is important to note that the SEED school's entire mission is to serve at-risk students and having an IEP is one of the ways that students can demonstrate eligibility to attend the SEED school. It should also be noted that Kent, Somerset, and the SEED School are generally small, serving a total of approximately 2,700 students in 2017-18. As a result, it takes relatively fewer additional students with IEPs in these districts to increase the overall percentage.

Maryland's nearly 100,000 students with disabilities were found eligible in a broad range of disability categories as shown in Exhibit 3. The most common disability classifications are, for ages 6 to 22, specific learning disability, other health impairment, and speech or language impairment. For ages 3-5, the most common classifications were developmental delay and speech or language impairment.

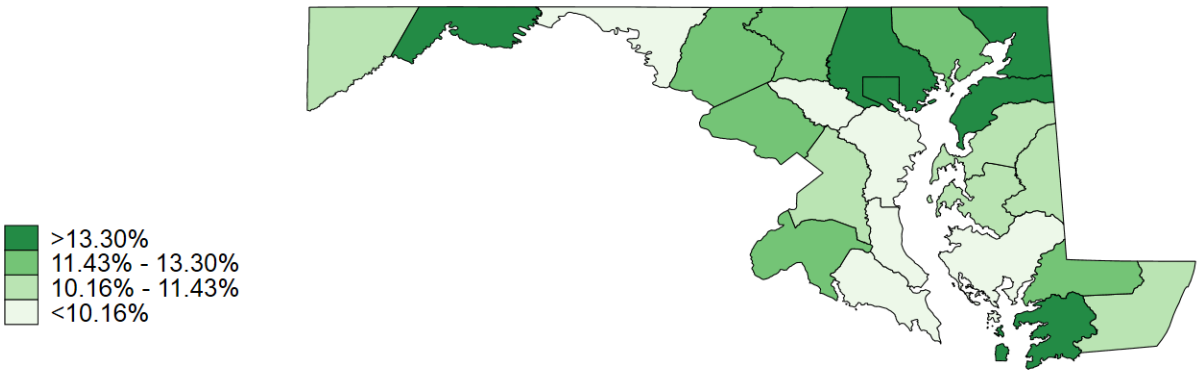
Exhibit 3. Count and Percentage of Children in Each Special Education Disability Category Based on Oct. 1, 2018 Child Count

Disability Category	Age three to five (n, % of total)	Age six to twenty-two (n, % of total)
Autism	1,123 (7.71%)	10,101 (11.27%)
Deaf-blindness	<10 (<.01 %)	<10 (<.01 %)
Developmental Delay*	8,679 (59.62%)	3,420 (3.82%)
Emotional Disability**	<10 (<.01 %)	4,993 (5.57%)
Hearing Impairment	89 (0.06%)	503 (0.56%)
Intellectual Disability	33 (0.02%)	5,915 (6.88%)
Multiple Disabilities	157 (1.08%)	5,226 (0.58%)
Orthopedic Impairment	16 (<.01 %)	137 (.15%)
Other Health Impairment	278 (<.01 %)	18,142 (20.25%)
Specific Learning Disability**	0 (0 %)	29,759 (33.20%)
Speech or Language Impairment	4,145 (28.47%)	10,974 (12.25%)
Traumatic Brain Injury	<10 (<.01 %)	188 (<.01 %)
Visual Impairment	22 (.15%)	231 (<.01 %)
TOTAL	14,558	89,593

NOTE: Local systems may only classify children under the category of Developmental Delay up to age 9. Local systems do not typically classify Emotional Disability and Specific Learning Disability until school age, which is consistent with national practice.

Exhibit 4 displays these same percentages in a map, leading to similar conclusions. There are no emerging patterns showing that geographic locale accounts for the proportion of students in special education.

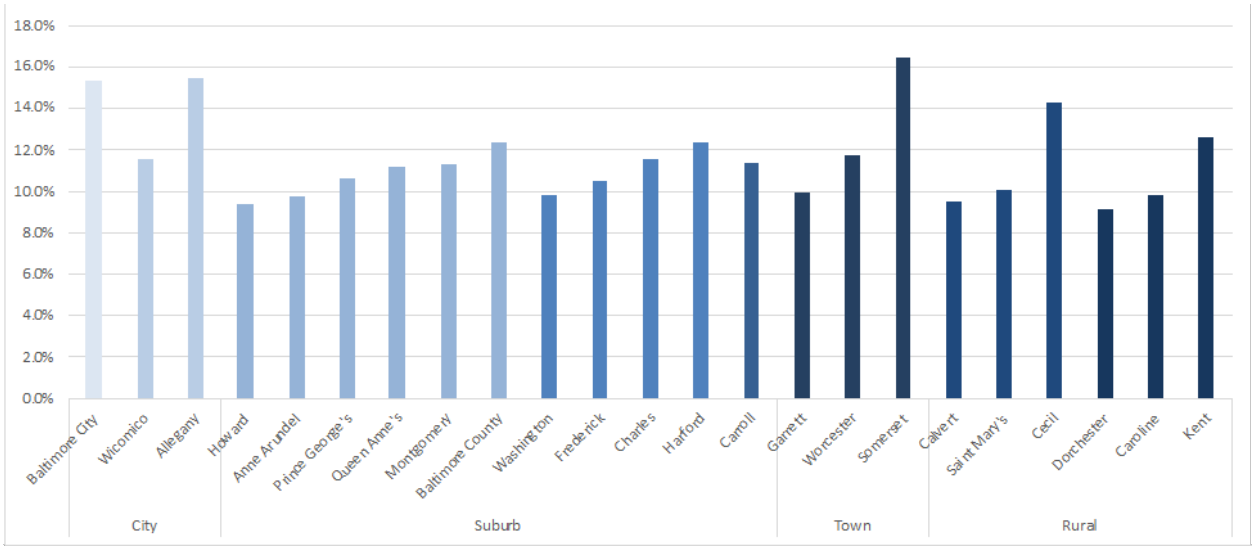
Exhibit 4. LSSs' Percentages of Students in Special Education, K–12, 2017-18



Source: MSDE, End-of-Year Attendance Files, SY 2014–2018.

Exhibit 5 displays proportions of students served by LSS/PAs according to their urban-centric locales as defined by the U.S. Census Bureau.

Exhibit 5. LSSs' Percentages of Students in Special Education, K–12, by Urban-Centric Locale, 2017-18



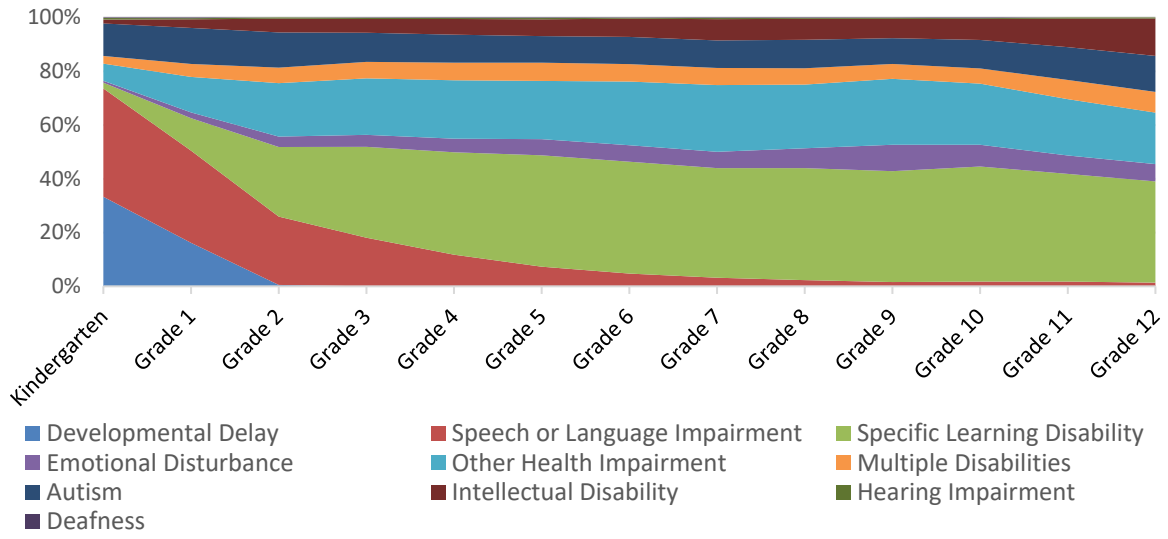
Sources: MSDE, End-of-Year Attendance Files, SY 2014–2018, and U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "School District Geo-Centric Category," 2013–14 through 2016–17.

The breakdown of the proportion of those students in special education against the urban-centric locales of the LSS/PAs shows no clear pattern except that, on average, larger and more urban systems have slightly elevated proportions of students in special education, compared with other LSS/PAs. However, the individual districts with the largest proportions are still generally small, showing an interesting split where the smallest and largest systems have the largest proportions. There are no emerging patterns showing that geographic locale accounts for the proportion of students in special education.

Volume and Type of Student Disability over Time

The type of disabilities being served by LSS/PAs and the number of students with disabilities also shift over the span of students' public school experience between kindergarten and 12th grade. Exhibit 6 provides a display of the type of disability category for Kindergarten through 12th grade across all LSS/PAs.

Exhibit 6. Students in Special Education by Grade and Type of Disability, K–12, 2017-18



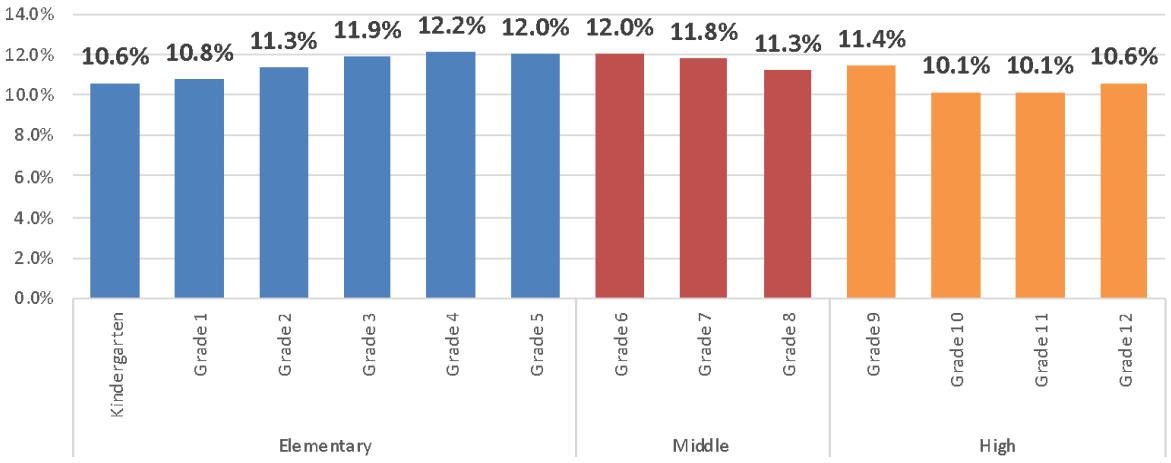
Sources: MSDE, Maryland Online Individualized Education Program (MOIEP) Data, SY 2015–2019; Baltimore County Public Schools, Online Individualized Education Program (OIEP) Data, 2017-18 school year; Anne Arundel County Public Schools, OIEP Data, 2017-18 school year; Howard County Public Schools, OIEP Data, 2017-18 school year; Wicomico County Public Schools, OIEP Data, 2017-18 school year.

Exhibit 7 shows the distribution of identified disabilities as a percentage of total students in special education across grade levels. Among the most common disabilities for the youngest students are developmental delays and speech/language challenges. These two categories account for the vast majority of identifications for kindergarten and first grade students. This is not an unexpected observation in Maryland's data around students with disabilities, as many students are in the early stages of development, and speech and language issues and/or developmental delays are the ways many young children first demonstrate eligibility for special education. Beginning in third grade, there is a sharp increase in the identification of children having specific learning disabilities that continues to

grow for a few years and then remains steady until 12th grade. Speech and language impairment identification rates decline quickly after second grade and are a very small percentage of students with disabilities by middle school. Other health impairments also begin to rise around second grade and continue as a consistent percentage of total through 12th grade. These two categories of disability, other health impairments and specific learning disability, peak in the 6th and 9th grades and comprise nearly two-thirds of students with disabilities in later grades. Students identified as having autism, which is the third-highest proportion of students with disability in those years proceeding third grade, make up a fairly consistent portion of the student population, ranging from a low of 594 students in 8th grade to a high of 1,016 students in 6th grade.

In addition to the types of disabilities that emerge around certain grades, the researchers also identified changes in the volume of students with disabilities by grade. Figure 54 displays the students with disabilities as a proportion of total membership by grade. The proportion of total membership climbs throughout the elementary grades plateauing at the 4th to 6th grades before a slight decline through the middle grades to 9th grade followed by a sharper drop-off through the remainder of high school.

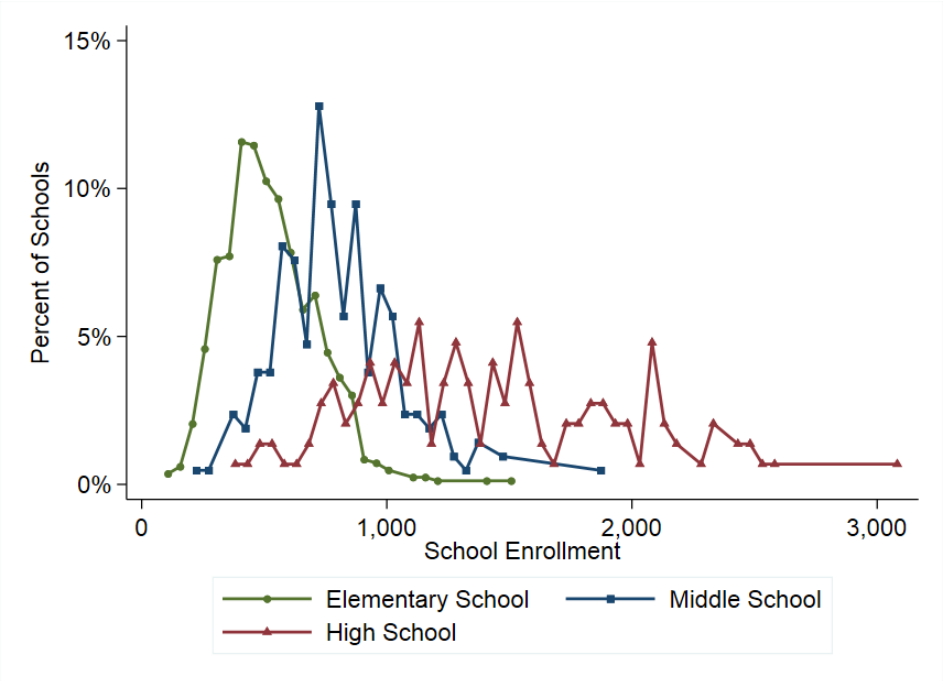
Exhibit 7. Students in Special Education by Grade as a Percentage of Total Membership, K–12, 2017-18



Sources: MSDE, MOIEP Data, SY 2015–2019; Baltimore County Public Schools, OIEP Data, SY2018; Anne Arundel County Public Schools, OIEP Data, SY2018; Howard County Public Schools, OIEP Data, SY2018; Wicomico County Public Schools, OIEP Data, SY2018; MSDE, End-of-Year Attendance Files, SY 2014–2018. Notes: (1) Figures represent totals for LSS/PAs only. This does not include public agencies. (2) Special education numbers include: Eligibility 1, defined as a student with a disability served in a public school or placed in a nonpublic school by the public agency to receive a free and appropriate public education (FAPE), and (2) Eligibility 2, defined as parental placed private school student with a disability receiving special education and/or related services through a service plan from the public agency.

The researchers also looked for trends among school types. Exhibit 8 shows the frequency of elementary, middle, and high schools plotted by the total school population. As expected, populations increase with the increase in grade level.

Exhibit 8. Frequency of Schools by Type, K–12, 2018



Source: MSDE, End-of-Year Attendance Files, SY 2014–2018.

The researchers also identified trends in the categories of potential high-growth disabilities reported in MSDE's Census Data and Related Tables. Exhibit 9 reports changes in four high-growth disabilities in grades Kindergarten through 12th grade.

Exhibit 9. Trends in Students in Special Education by High-Growth Disabilities Identified in MSDE Census-based Data, K–12, 2016–2018

Disability Type	2016	2017	2018	Average Year over Year
Total State	92,512	93,712	95,291	1.5%
Multiple Disabilities	4,714	5,159	5,675	9.7%
Autism	9,409	9,971	10,577	6.0%
Emotional Disability	5,395	5,333	5,318	-0.7%
Specific Learning Disability	32,775	32,501	32,215	-0.9%

Sources: MSDE, MOIEP Data, SY 2015–2019; Baltimore County Public Schools, OIEP Data, SY2018; Anne Arundel County Public Schools, OIEP Data. SY2018; Howard County Public Schools, OIEP Data, SY2018; Wicomico County Public Schools, OIEP Data, SY2018. Notes: (1) Figures represent totals for LSSs only. This does not include public agencies. (2) Special education numbers include: Eligibility 1, defined as a student with a disability served in a public school or placed in a nonpublic school by the public agency to receive FAPE, and (2) Eligibility 2, defined as

parental placed private school student with a disability receiving special education and/or related services through a service plan from the public agency.

The four high-growth disabilities identified in Maryland include: multiple disabilities, autism, emotional disability, and specific learning disability. Over a three-year period, multiple disabilities and autism show continued strong growth among students with disabilities in Maryland. Multiple disabilities grew to 5,678 students in 2018, from 4,714 in 2016, representing a 9.7% growth. Autism grew to 10,577 students in 2018, from 9,409 in 2016, representing a 6.0% growth. The sum total of students in these two categories (multiple disabilities and autism) accounts for most of the total overall growth in Maryland of students with disabilities (77% of the increase in students). A small number of LSSs account for most of the growth. This was in contrast to the two other disabilities identified as high growth, emotional disability and specific learning disability, which experienced slight declines over the same period.

Exhibits 10 and 11 display the change in the number and percent of students with autism by LSS/PA over the period of 2016 through 2018. Four of the biggest LSSs in Maryland — Baltimore County, Montgomery, Prince George's, and Baltimore City — all added at least 140 students over this three-year period, which accounted for the majority of the state's overall growth. Similar patterns can be observed when looking at the multiple-disabilities category. Similar to students identified as having autism, just a few LSSs explained most of the change in students with multiple disabilities from 2016 through 2018 in K–12. These include Anne Arundel, Frederick, and Baltimore County, which accounted for 76% of the increase in students (720 of the total 943) in the multiple-disabilities category.

Exhibit 10. Change in the Number and Percent of Students with Autism by LSS/PA, K–12, 2016–2018

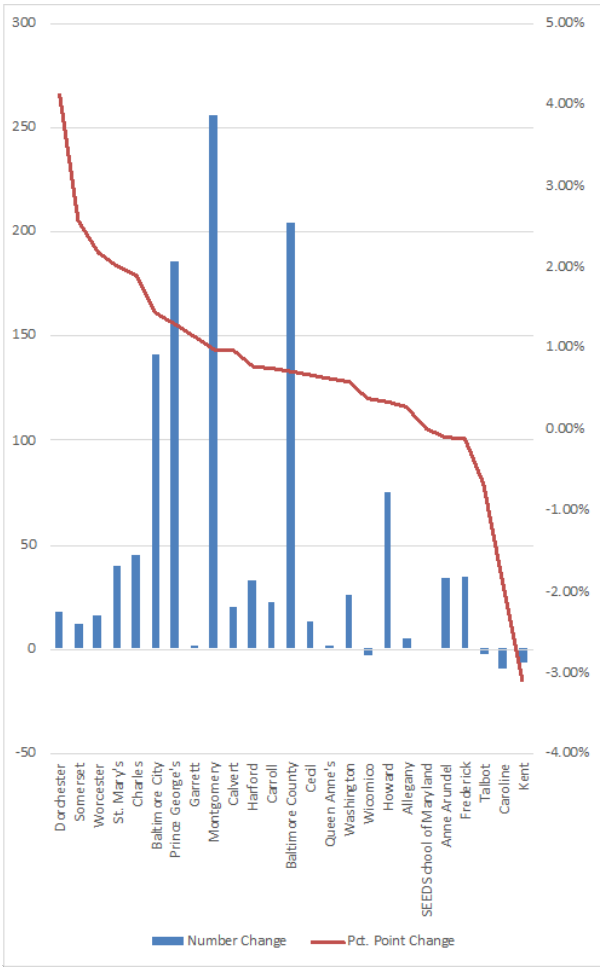
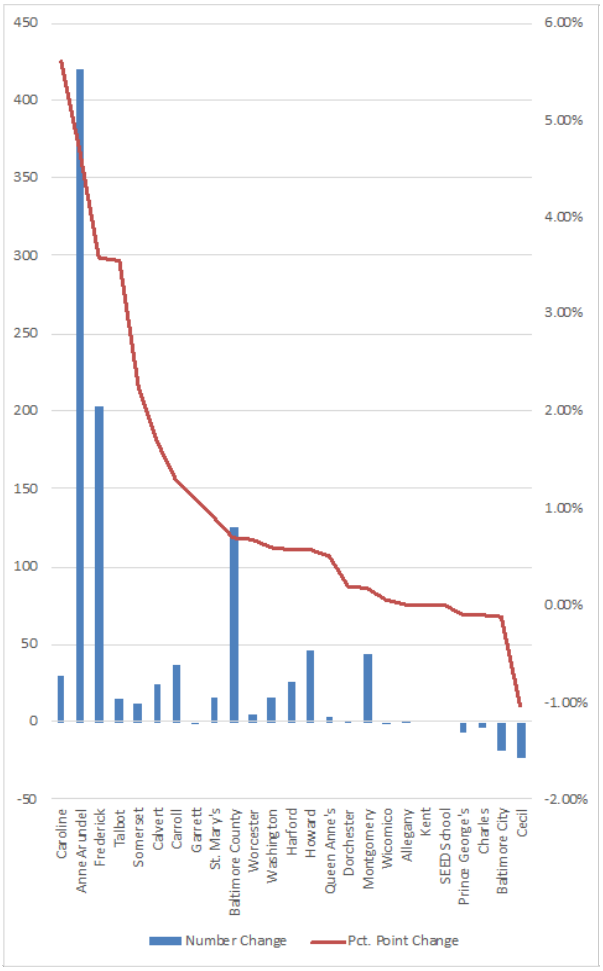


Exhibit 11. Change in the Number and Percent of Students with Multiple Disabilities by LSS/PA, K–12, 2016–2018



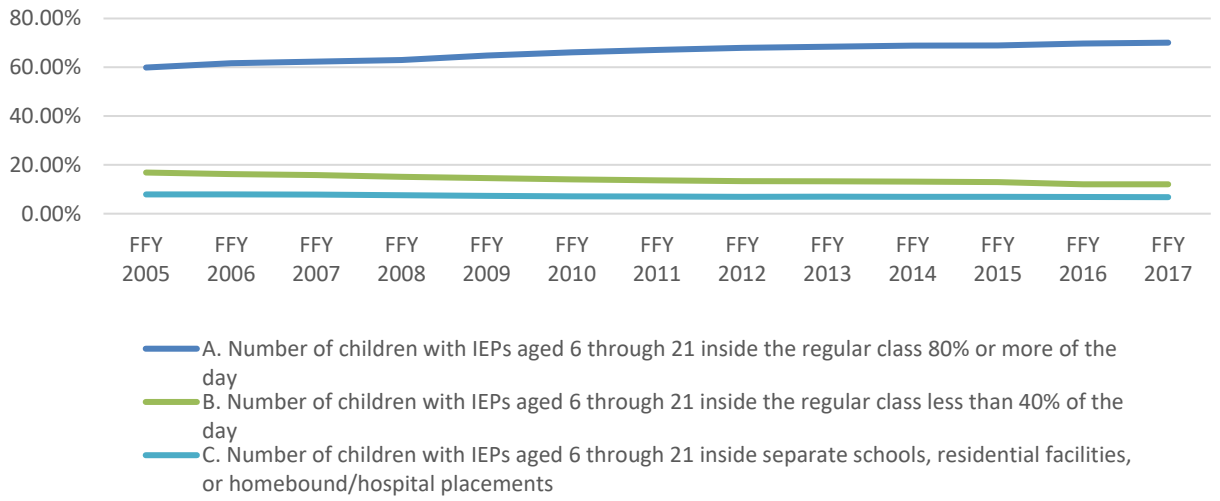
Sources: MSDE, MOIEP Data, SY 2015–2019; Baltimore County Public Schools, OIEP Data, SY2018; Anne Arundel County Public Schools, OIEP Data, SY2018; Howard County Public Schools, OIEP Data, SY2018; Wicomico County Public Schools, OIEP Data, SY2018.

Least restrictive environment

The Individuals with Disabilities Education Act (IDEA) requires that students with disabilities receive special education and related services in the least restrictive environment. LSS/PAs report to MSDE, and MSDE reports to the United States Department of Education, on the percent of children with IEPs aged 6 through 21 served: in the regular class 80% or more of the day; in the regular class less than 40% of the day; and in separate schools, residential facilities, or homebound/hospital placements (20 U.S.C. 1416(a)(3)(A)).

Over the past decade, Maryland has significantly increased the number of children with disabilities that receive education services in the regular class 80% or more of the day, while decreasing the other two categories. Exhibit 12 shows this increase — from 60.11% in federal fiscal year (FFY) 2005, to 70.09% in FFY 2017. These data show that LSS/PAs have shifted their systems such that approximately 10,000 children have moved from more restrictive environments to the general education classroom over the last decade. Over those same years, Maryland served a varying number of children, decreasing from 95,149 in FFY 2006 to 90.449 in FFY 2011, then increasing to 97,233 in FFY 2017.

Exhibit 12. Statewide Settings Data from FFY 2005 through FFY 2017



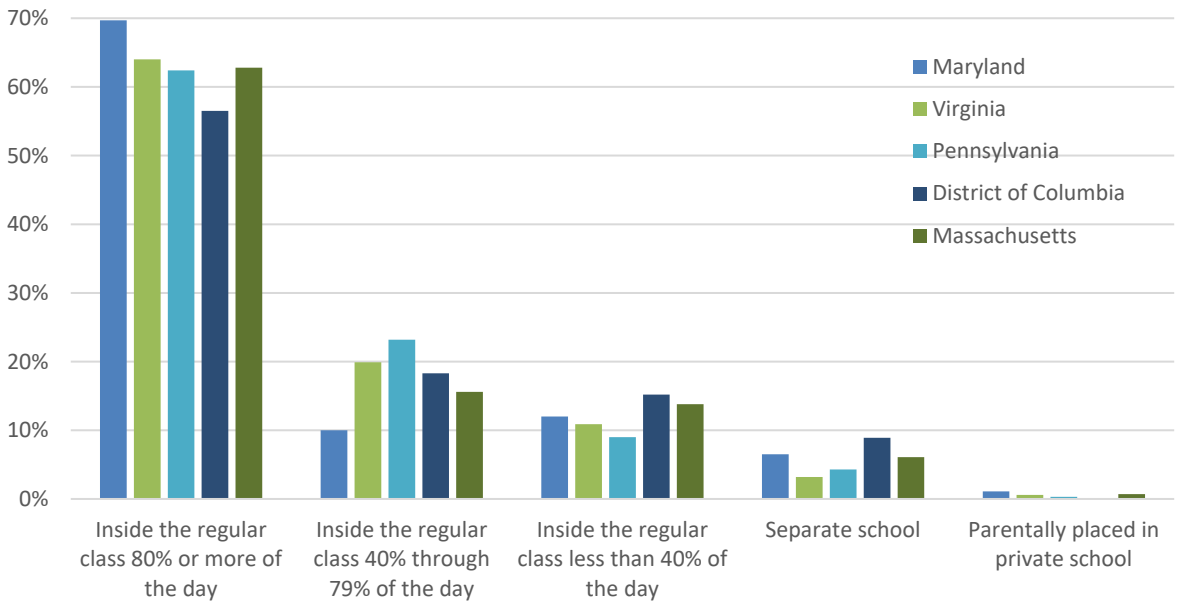
Source: Maryland Annual Performance Report, Indicator 5 (MSDE, 2019)

For children ages 3 through 5, MSDE and LSS/PAs report on the percent of children with IEPs attending: a regular early childhood program and receiving the majority of special education and related services in that regular early childhood program; a separate special education class; and a separate school or residential facility (20 U.S.C. 1416(a)(3)(A)). This indicator is a newer reporting requirement than others and has only been included for the last five years in states' Annual Performance Reports (APRs) — accounts of student and system performance which states are required to submit to the federal Office of Special Education Programs (OSEP), each February. Data for children ages 3 through 5 in Maryland are similar to the data for school-aged children, with 62.72% of children receiving the majority of special education and related services in a regular early childhood program.

The researchers looked at statewide LRE data for Maryland and a few neighboring states for additional context. While Maryland is above average in the percentage of students served inside the regular class for 80% or more of the day, it has one of the highest percentages of students served in public or private separate schools at public expense — 6.5% in 2016, the most recent year that nationwide data are available. In the same year only Connecticut (7.3%), District of Columbia (8.9%), and New Jersey (6.7%) were higher. Proportionately, Maryland's percentage of students served in public school regular classes 40-79% of the day and less than 40% of the day is lower than most states. Exhibit 13 shows the different

education environments (LRE settings) for 6- to 21-year-olds in Maryland and several peer states including Virginia, Pennsylvania, District of Columbia, and Massachusetts.

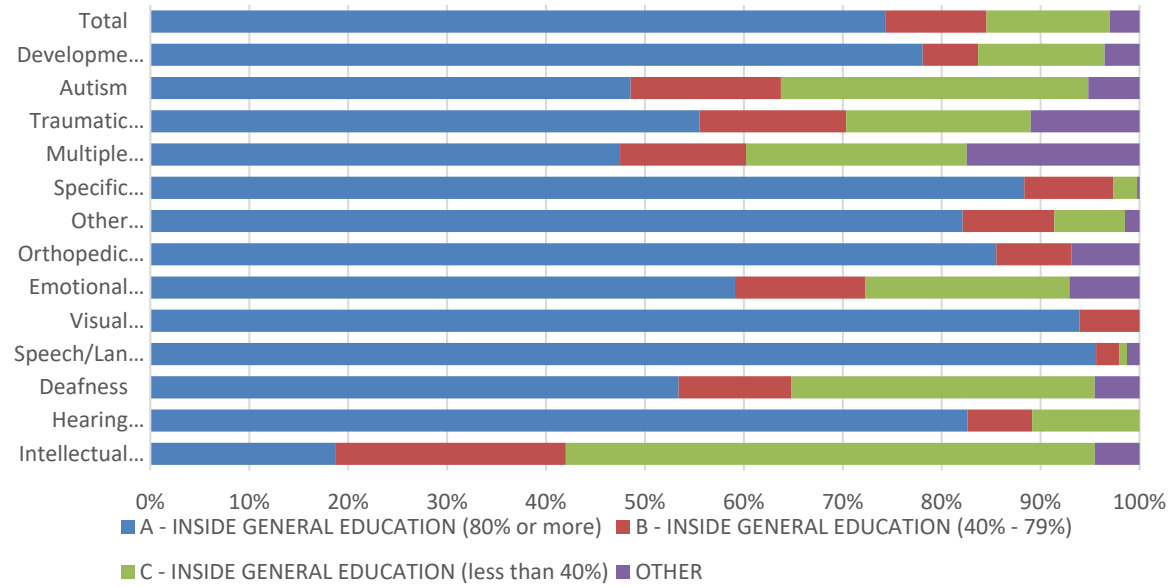
Exhibit 13. Percent of Students, Ages 6–21 Receiving Special Education, by Educational Environment and State, 2017–18



Source: U.S. Department of Education, Ed *Facts* Data Warehouse (EDW), OMB #1875-0240: "*IDEA* Part B Child Count and Educational Environments Collection," 2016. Data were accessed fall 2019. Authors selected states.
Notes: All categories of educational environment are displayed with the exception of residential facility, homebound/hospital, and correctional facility which represent less than 2% in aggregate for any of the reported states.

Exhibit 14 shows students by disability type and the degree to which they are served in the general education environment with typically developing peers. These are statewide averages — the data vary by LSS/PA. As mentioned above, of particular concern is the frequency of students being sent out of regular schools to be served in public and private separate schools. This chart shows restrictive settings in purple. Restrictive settings include separate schools, homebound, hospital, and residential facilities.

Exhibit 14. Distribution of Categories of LRE by Disability, 2017-18



Source: Maryland State Department of Education. Maryland Online Individualized Education Program (MOIEP) Data. SY2015 through 2019; Baltimore County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Anne Arundel County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Howard County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Wicomico County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018.

Disproportionality

States are required to identify disproportionality in special education, in specific disability categories, in settings, and in discipline by race and ethnicity. LSSs with significant disproportionality of any race or ethnicity group in special education are required to examine the contributing factors, as there may be inappropriate identification of children with disabilities. As described in Equity, Inclusion, and Opportunity, Addressing Success Gaps (O'Hara, Munk, Reedy, & D'Agord, 2016). Recently Maryland, following a December 2016 change to federal special education regulations at 34 C.F.R. § 300.646(b), adopted a more comprehensive approach to identifying significant disproportionality as documented in COMAR 13A.05.02.04. The state has moved swiftly and in advance of many other states to implement the more rigorous federal requirements. As a part of implementation, the state engaged in a comprehensive statewide process of involving stakeholders and examining root causes.

Researchers calculated risk ratios to evaluate disproportionality in the state. Exhibit 15 displays the disproportionality of students in special education by race and ethnicity in the state of Maryland in 2017-18. Disproportionality is expressed in a risk ratio, which quantifies the risk of identification as a student with a disability for a student of a specific race or ethnicity compared to all other race or ethnicities. A risk ratio of 1.38, as reported for Black/African American students in the exhibit below

means that a student of that race or ethnicity is 1.38 times as likely to be identified for special education than all students in the state from all other race/ethnicities.

Exhibit 15. Disproportionality of Students in Special Education by Racial/Ethnic Category and LSS, 2018

Race or Ethnicity Category	Total Enrollment	Special Education Enrollment	Special Education Percentage	Risk Ratio
American Indian/Alaska Native	2,340	222	9.49%	0.80
Asian	59,360	3,524	5.94%	0.49
Black/African American	301,938	43,696	14.47%	1.38
Hispanic	157,657	17,606	11.17%	0.93
Multiple Races	40,913	4,546	11.11%	0.94
Native Hawaiian/Pacific Islander	1,290	64	4.96%	0.42
White	331,626	36,167	10.91%	0.88
Total	895,124	105,825	11.82%	NA

Source: MSDE, End-of-Year Attendance Files, SY 2014–2018.

Researchers also evaluated identification in disability categories and placement in specific educational settings for disproportionality and only found one additional instance of disproportionality with a risk ratio greater than 1.5 -- Black/African American students with disabilities were 1.88 times as likely to be identified as having an intellectual disability.

Methods and data sources

This section of the report describes the analytical framework and methods used by the researchers to gather the information and evidence that are the basis for the conclusions and recommendations provided later, and their applicability to the state of Maryland. Researchers employed a mixed-methods approach that combined analysis of both quantitative and qualitative data sources. This approach supported the triangulation of information, providing higher degrees of confidence both in the conclusions and in subsequent recommendations. This section includes a discussion of the analytical framework and of each of the methods used in this investigation and their contribution to the report.

Summary of methods

Researchers employed six methods in this part of the study: interviews with key staff at the state and local agency levels; focus groups; school visits; online surveys; document review; and a quantitative data analysis. Exhibits 16 and 17 present the data collected and methods employed for the topics contained within each chapter.

Exhibit 16. Data Sources Used for Each Research Focus Area -- Chapter 1

Data Source	MSDE technical assistance to LSSs	Clarifying and simplifying the IEP process	Modifying the goals and strategies of IEP teams
Quantitative data		X	X
Maryland Online IEP (MOIEP) data (IEP form data)	X	X	X
LSS special education director interviews[3]	X	X	X
LSS principal interviews	X	X	X
Local family support services coordinator interviews		X	X
LSS special education director focus groups	X	X	X
LSS IEP chairperson surveys	X	X	X
LSS IEP chairperson focus groups	X	X	X

[3] Some interviews included representatives from the LSS chief financial officer's office.

Data Source	MSDE technical assistance to LSSs	Clarifying and simplifying the IEP process	Modifying the goals and strategies of IEP teams
LSS and public agency staffing plans	X		X
DEI/SES staff interviews	X	X	X
Special and general education teacher focus groups	X	X	X
Family and student focus groups	X	X	X

Exhibit 17. Data Sources Used for Each Research Focus Area -- Chapter 2

Data Source	Allocation of Special Education Staff, Resources	Effectiveness of Family Support Services	Staff Retention
Quantitative data	X		
Maryland Online IEP (MOIEP) data (IEP form data)	X		
LSS/PA special education director interviews[4]	X	X	X
LSS/PA principal interviews	X		X
Local family support services coordinator interviews		X	
LSS/PA special education director focus groups	X	X	X
LSS/PA IEP chairperson surveys		X	
LSS/PA IEP chairperson focus groups	X	X	
LSS/PA staffing plans	X	X	X

[4] Some of these interviews included representatives from the LSS/PA chief financial officer's office.

Data Source	Allocation of Special Education Staff, Resources	Effectiveness of Family Support Services	Staff Retention
DEI/SES staff interviews	X	X	X
Special and general education teacher focus groups		X	
Family and student focus groups		X	

Each of the research methods is further described below in Exhibit 18, including information on the participants and/or examples of the different methods used.

Exhibit 18. Methods and Participants in Qualitative Data Collection

Method Used	Brief Description	Participants/Information Analyzed
Interviews	Conducted 60- to 90-minute interviews with key state and local special education leaders, using a structured protocol	· Principals · MSDE division leaders and staff · Advocacy group representatives
Focus groups	Conducted focus groups statewide with professionals working in similar roles in special education	· SS directors of special education · Family support services coordinators · Parents, families, and students
School visits	Visited 23 schools in 10 LSSs and four public agencies	· IEP chairpersons including observation of IEP meetings · Principals · General and special educators and related services providers including classroom observations
Online surveys	Administered statewide surveys to key special education stakeholders	· Special Local Special Education Citizens Advisory Committee (SECAC) members and parents
Document review	Analyzed documents provided by state and local agencies	Documents reviewed are listed later in this section.

Method Used	Brief Description	Participants/Information Analyzed
Quantitative data analysis	Analyzed data from various data systems in Maryland	Data reviewed are described later in this section.

Interviews

The researchers conducted interviews at both the state and local levels of the special education system. Each 60- to 90-minute interview was conducted using a structured interview protocol, allowing for cross-interview question–response comparison. Interview protocol are provided in Appendix 7.

At the local level, researchers interviewed 14 directors of special education representing a subset of the total 24 LSSs and 4 PAs that serve students with disabilities. This subset included the 10 LSSs visited, plus the four public agencies: Maryland School for the Deaf, Maryland School for the Blind, JSES schools, and the SEED School.

At the state level, researchers interviewed a total of six teams and three individuals. At MSDE, this included the Deputy Superintendent for Teaching and Learning; the Executive Director of the Office of Finance and Administration, Office of Policy and Fiscal Analysis; and the DEI/SES Assistant State Superintendent, as well as select teams from the following DEI/SES branches: Family Support and Dispute Resolution; Performance Support and Technical Assistance; Policy and Accountability; Resource Management and Monitoring; and Secondary Transition. Researchers also conducted interviews with leaders from four other state agencies and councils, including:

- State Rehabilitation Council
- Division of Rehabilitation Services
- Developmental Disabilities Administration
- Department of Disabilities
- Developmental Disabilities Council

In addition to local and state agency staff, researchers also interviewed a total of 11 individuals from the following advocacy organizations: Parents' Place of Maryland, Disability Rights Maryland, and Project HEAL (Health, Education, Advocacy, and Law) at the Kennedy Krieger Institute.

Most interviews were recorded, and study staff created transcripts from either written notes or recordings. Transcripts were reviewed for key words and summary statements were created indicating when a specific phrase was used by more than one third of interviewees.

Focus groups

Researchers sought input from staff, families, and students from all 24 LSSs and the four PAs (Maryland School for the Deaf, Maryland School for the Blind, JSES schools, and the SEED School) through focus groups. During the focus group protocol, researchers asked participants to share their general attitudes

and beliefs about family support services and their effectiveness; the adequacy of special education funds; the strengths and challenges of the allocation of staff and resources; and shortages in, and retention of, special education staff.

The researchers conducted focus groups with local family support services coordinators at a statewide event. Of a possible 24 local family support services coordinators, 21 participated. Of these 21 participants, 16 also completed a questionnaire prior to the focus group. Researchers asked participants if they were comfortable being recorded, for the purpose of capturing input accurately and creating a transcript with names of people and places redacted. Of the 21 participants, five were not comfortable being recorded. A separate focus group was conducted with those five participants who preferred not to be recorded. A recorded focus group was conducted with the other 16 participants.

Researchers attended five regional Professional Learning Opportunities (PLO) offered by MSDE on local implementation lessons learned related to three Strategic Plan imperatives: early childhood education; secondary transition, and access, equity, and progress. Researchers also attended a PLO in the fall of 2018 that provided critical information and guidance for LSS/PAs and public agencies leading to the lessons learned in the spring of 2019. Exhibit 19 presents each of the regional focus group locations, dates, and the numbers of participants, not including the Fall 2018 PLO.

Transcripts from recordings or notes from each focus group were reviewed and coded to track themes in responses to each question. At some focus groups, participants provided written responses to questions which were included in the qualitative data analysis to identify trends and draw conclusions.

Exhibit 19. Regional Focus Groups for Special Education Directors

Region	Meeting Participants	Meeting Location	Date	Number of Participants
1	Allegany, Carroll, Frederick, Garrett, Washington[5]	Frederick	April 3, 2019	66
2	Howard, Montgomery, Prince George's	Ellicott City	April 2, 2019	41
3	Baltimore City, Cecil, Harford, JSES schools, SEED School, School for the Blind[6]	Hunt Valley	April 9, 2019	66
4	Anne Arundel, Calvert, Charles, St. Mary's	Annapolis	April 8, 2019	53
5	Caroline, Kent, Queen Anne's, Somerset, Talbot, Worchester, Wicomico[7]	Cambridge	March 29, 2019	66

[5] Frederick County is included in this region but was unable to attend this regional focus group.
[6] Baltimore County is included in this region but was unable to attend this regional focus group.
[7] Dorchester is included in this region but was unable to attend this regional focus group.

During and after each regional event, researchers hosted one focus group for all of the special education directors in that region, and one focus group for all of the secondary transition coordinators in that region. The Region 3 focus groups also included the special education directors and secondary transition coordinators for the four public agencies.

Online surveys

Researchers created and distributed online surveys for special education teachers, general education teachers, and IEP chairpersons to all LSS/PAs for dissemination. Surveys were tailored to capture the perspectives and perceptions of general education classroom teachers, special education teachers and related services providers, and IEP chairpersons. Initially, parents were not surveyed because MSDE conducts a required parent survey during the same time period, and researchers agreed not to over-survey families. Later, parents and SECAC leaders who could not attend a focus group expressed a desire to provide input. As a result, online surveys were created and disseminated to SECACs in both English and Spanish. Limitations of parent survey data, including the low number of respondents and the potential bias of parents who served on the SECAC, are addressed in the sections below where these data are reported.

Exhibit 20 describes the different groups of respondents to the surveys.

Exhibit 20. Online Survey Respondent Results

Type of Respondent	Number of Responses	Type of Agency	Percentage of Total Population[8]
General education teacher	2,892	18 LSSs, 1 public agency	5.9%
Special education teachers[9]	1,970	23 LSSs, 3 public agencies	23.2%
IEP chairpersons	490	20 LSSs, 3 public agencies	24.5%
SECAC/parents, English[10]	175	n/a	0.2%
SECAC/parents, Spanish[11]	15	n/a	0.2%

[8] Percentages are based upon the number of respondents divided by the count of that type of respondent that was obtained by the researchers. The researchers' counts indicate that there are approximately 49,200 general education teachers, 8,500 special education teachers, and approximately 2,000 IEP chairpersons. For parents, the total number of respondents is divided by 97,233, the Fall 2018 count of students with disabilities.

[9] This count includes other special education support staff, such as speech language pathologists and other related staff.

[10] The majority of these respondents have children in primary grades.

[11] The majority of these respondents have children in early primary grades and/or last secondary grades.

Survey data were cleaned to delete duplicate entries or entries that were not appropriate for the specific survey (e.g., if a teacher completed the *general* education teacher survey but then indicated in the survey that he/she was a *special* education teacher). The researchers ran descriptive statistics on survey data and analyzed data by LSS to look for trends among or between LSSs.

The researchers reviewed and coded data collected from open-ended questions, creating categories of responses and tabulate the frequency of response categories and specific responses. After identifying and removing erroneous responses (e.g., blank responses, responses unrelated to the IEP process) and responses of N/A or blank, new totals were calculated for each open-ended question to accurately identify trends. Responses were reviewed for themes and grouped accordingly.

School visits and observations

Between May and July 2019, researchers visited 10 of the 24 LSSs and all four PAs. The 10 LSSs were selected to be representative of the state's diversity. LSSs were selected to gain a representative sample of overall student enrollment, enrollment by race and ethnicity, percent of students identified as eligible for free- or reduced-price lunch, special education identification rate, graduation rate of students with disabilities, students with disabilities' performance on English language arts and math assessments, geographic location, and trends in LRE placement. The selection of schools within the 10 selected LSSs was stratified by elementary, middle, and high school levels; special education identification rates; graduation rates; English language arts and math performance of all students and students with disabilities; alternate assessment rate; geographic location; and LRE trend data.

Exhibit 21 lists the LSSs, schools, and PAs the researchers visited. Researchers worked with selected school systems to choose two schools from an identified subset of schools that met the stratification criteria. In addition, researchers visited two of the 13 JSES schools — one for youths who are committed, and one for youths who are detained.

Exhibit 21. List of LSSs, Schools, and Public Agencies Visited

LSS or Public Agency	Schools Visited
Allegany County	Cresaptown Elementary School Mountain Ridge High School
Anne Arundel County	Tyler Heights Elementary School Annapolis High School
Baltimore City	Barklay Elementary and Middle School

LSS or Public Agency	Schools Visited
	Mount Royal Elementary and Middle School[12]
Baltimore County	Red House Run Elementary School Owings Mills High School
Charles County	Dr. James Craik Elementary School Benjamin Stoddert Middle School
Montgomery County	Glenallen Elementary School John T. Baker Middle School
Prince George's County	Chesapeake Math and IT Elementary Public Charter School Oxon Hill High School
Queen Anne's County	Staff from multiple schools[13]
Somerset County	Princess Anne Elementary School Crisfield Academy High School
Talbot County	Easton Elementary School St. Michaels Middle School
JSES schools	Backbone Mountain Youth Center, Garrett County Waxter Children's Center, Laurel
School for the Blind	Maryland School for the Blind
School for the Deaf	Frederick Campus
SEED School	SEED School

During the school visits, the researchers worked with school principals to schedule a full day, in order for the researcher to include as many of the following activities as possible:

- Interview with the building principal
- Focus groups with special education teachers and related service providers

[12] This visit was to a summer school and special education extended-school-year program.
[13] This visit was to several summer school and special education extended-school-year programs.

- Focus groups with regular education classroom teachers
- Interviews or a focus group with IEP chairperson, special education department chair, due process facilitator, and assistant principal
- IEP meeting observation, when possible
- Classroom observations

Document review

Researchers reviewed a significant amount of documentation as part of the study, including but not limited to the following:

- The Strategic Plan
- Maryland's current and past State Performance Plans (SPPs) and Annual Performance Reports (APRs) to the U.S. Department of Education, including the State Systemic Improvement Plan (SSIP)
- Technical Assistance Bulletins including Improving Outcomes for Students with Disabilities: Curriculum, Instruction, and Assessment; Provision of Accessible Copies of Documents to Parents; Documentation of Delivery of Related Services; and Secondary Transition
- MOIEP Process Guide
- Local Application for Federal Funds (LAFF)
- DEI/SES website
- LSS/PA staffing plans
- Public agency financial statements
- Code of Maryland Regulations (COMAR)
- Online IEP Learning Modules including Present Levels of Academic and Functional Performance, Goals and Objectives, Specially Designed Instruction, Progress Monitoring, and Family Engagement

Quantitative analysis

The quantitative analysis leveraged data from multiple state data collection sources. These data sources included the following: annual financial report (AFR) data; MSDE attendance files (end-of-year membership), which include student demographic data; public data on school and district characteristics; and Maryland Online IEP data, including data contained in the IEP form. Some of the LSS/PA datasets were provided directly to the researchers as a result of the LSS/PA not participating in one or more of the aforementioned data systems. Following is a brief discussion of each of the data sources, including the years of data provided, categories of data made available, and exceptions to the information provided. Exhibit 22 provides a summary of the quantitative data source aligned to the section of the report.

Exhibit 22. List of Quantitative Datasets used for Sections of the Study

Datasets	State Policy Scan	Int'l Policy Scan	State Weights Study	Cost Adequacy Study
LSS's IEP data (MOIEP and four LSS directly)				X
LSS's Annual Financial Records (AFRs) (MSDE)				X
LSS Attendance Records (provided by MSDE)				X
LSS Assessment Data (provided by MSDE)				X
LSS Graduation Data (provided by MSDE)				X
Public School and District Characteristics Data (NCES)				X
Early Childhood Longitudinal Study of Kindergarten (NCES)			X	
State special education funding formulas and weights (national sources)	X		X	
State special education funding formulas and weights (each individual state)	X		X	
International special education funding formulas and studies (various sources)		X		

Annual financial report (AFR) data

The district-level AFR data, provided by MSDE, were for fiscal years 2014 through 2018. Each year of data included detailed financial records prepared annually by the state. Relevant to the present study, this includes all annual expenditures within the accounting structure defined in the Financial Reporting Manual for Maryland Public Schools.

MSDE attendance files

These student-level files, provided by MSDE for school years 2013–14 through 2017–18, reflected information about students in membership at the end of the school year. This information includes a student's school assignment, gender, race/ethnicity, grade, eligibility for free- or reduced-price lunch, limited English proficiency status, and whether the student was identified as needing an IEP.

MSDE staff salary data

Provided by MSDE for school years 2013-14 through 2017-18, these individual-level files reflect information about public school staff including salary, full-time equivalent (FTE), associated budget code, and position category by assignment including primary and secondary assignments. Staff demographics were also provided such as gender, race/ethnicity, and years of experience, for example.

MSDE assessment data

This includes Partnership for Assessment of Readiness for College and Careers (PARCC) testing data, provided by MSDE for school years 2014-15 through 2017-18 at the student level. This also includes Multi-State Alternate Assessment (MSAA) testing data, provided by MSDE for school years 2015-16 through 2017-18 at the student level. In order to use data from both assessments, only years 2015-16 through 2017-18 were able to be included in our analysis.

MSDE graduation data

This includes 4-year cohort graduation rates, denominator, and numerators at the school level for 2013-14 through 2017-18. Data was provided for all students and for just students with disabilities.

Public school and district characteristics data

These data files include information from the National Center for Education Statistics—Common Core of Data School Universe files. Public data were collected for available school years as needed. Public data from the U.S. Bureau of Labor Statistics, and the U.S. Census Bureau were used in the analysis.

Maryland online IEP data

Students who receive special education have required IEPs. The majority of LSS/PAs in Maryland use the Maryland Online IEP (MOIEP) system to document students' IEPs. The researchers were given secure access to the IEP data in the system, without personally identifiable information. For districts using MOIEP, data were provided for school years 2014–15 through 2018–19, with information as of May 2019. This included data from various sections of the IEP, such as basic student profile data (e.g., primary disability, annual review date), placement data (e.g., LRE code), Present Levels of Academic Achievement and Functional Performance (e.g., areas affected by student disability), Special Considerations and Accommodations (e.g., specific testing accommodations identified), Supplemental Aide Services and Other Services (i.e., Special Education, Related, and Career and Technical Education), and Goals (including goal progress).

For the five LSSs not participating in the MOIEP for all school years, IEP data were collected directly from the LSS from the local IEP system that was in use at the time of collection. These LSSs were Anne Arundel County, Baltimore County, Howard County, and Wicomico County for all school years, and Montgomery County for school years prior to 2017–18. While every effort was made to collect the same information as was collected from the aforementioned sections of the MOIEP, some variation in

available information was unavoidable. However, in general, information from each of these sections was provided for all five districts for the relevant school years.

General limitations are addressed here and more specific limitations in the non-MOIEP data are addressed directly in the sections where the data are reported and used for calculations. The largest limitation is that, because the IEP process may be completed at any point in the calendar year, a student may have multiple IEP forms in a given school year. While most non-MOIEP districts follow the same procedure as the MOIEP for identifying the appropriate IEP form for use in longitudinal data, Baltimore County and Montgomery County take a different approach. Specifically, MOIEP data, Anne Arundel, Howard, and Wicomico provided the current IEP within the school year (July 1–June 30). In contrast, Baltimore County and Montgomery County (for school years prior to 2017–18) provided IEP data as of October 1st. It was not possible to access data from these two districts using a procedure consistent with the others, but every effort was made to mitigate the impact of this misalignment.

To mitigate this particular misalignment, several steps were taken. To bring the misaligned districts to closer alignment with end-of-year data, the school year was assumed to be the school year prior to the collection date. For example, if the data were collected on October 1, 2017, then the school year was assumed to be 2016-17. This approach has the effect of capturing the year in which implementation of the IEP predominantly took place. Second, a consistent, external data source was identified: the MSDE attendance files. These data reflect students enrolled and identified as having an IEP as of the end of the school year and were chosen as the common directory for all analyses that used the IEP data. The MSDE attendance data source was selected in part because it was recommended as a source for indicators of special service populations by MSDE rather than the September 30 enrollment counts.

Next, using the MSDE attendance files as a common student directory, student data in the IEP files were matched to the attendance files at the student/year level. IEP data for any student identified for an IEP in the attendance files in a given year, was preserved for analysis. There was a subset of students (about 4.5%) identified for an IEP in the attendance files but not found in the IEP data in a given school year. About half of these students were in the misaligned districts of Baltimore County and Montgomery County (pre-2017-18) – with the likely cause being that these students were in membership in these districts as of the end of the school year but no longer in these districts (or identified for an IEP) as of October 1st. Finally, then, to capture IEP data for these specific students, their prior year collection was used. For example, for a student in this circumstance in 2016-17, IEP data collected on October 1st, 2016 were used, as opposed to October 1st, 2017. After making this change, the subset of students in this circumstance (i.e., identified for an IEP in the attendance file but not found in IEP data) was reduced to about 2% of students.

Chapter 1. MSDE technical assistance and the IEP process

Section 1.1. How LSS/PAs utilize MSDE technical assistance provided, based on the MSDE DEI/SES Strategic Plan, Moving Maryland Forward: Sharpen the Focus for 2020

This section of the report describes the technical assistance MSDE provides to Maryland LSS/PAs. States are obligated to meet, and support school districts to meet, IDEA fiscal and programmatic requirements. This section describes DEI/SES's system for providing technical assistance to Maryland LSS/PAs and assesses how LSS/PAs utilize MSDE technical assistance provided based on the Strategic Plan. This section provides a review of the literature and identification of best practices from the broad field of special education. After a description of what researchers observed at the state and local levels, this section provides both state and local conclusions with recommendations based on best practices including the best practices observed in the state during the study.

Research questions

Research questions for this focus area:

- What is MSDE's system for providing technical assistance to LSS/PAs?
- How does MSDE make decisions about the types and content of its technical assistance?
- How do LSS/PAs inform MSDE of technical assistance needs?
- What technical assistance has MSDE provided in each of the priority areas identified in the Strategic Plan: early childhood; access, equity, and progress; and secondary transition?
- How does MSDE evaluate the effectiveness of its technical assistance in changing LSS/PA practice?
- What responsibility do LSS/PAs have to demonstrate that they are effectively utilizing MSDE technical assistance?

Literature review and best practices

IDEA places responsibility for monitoring and enforcement of special education implementation of LEAs with SEAs. IDEA does not establish any direct relationship between the U.S. Department of Education, which distributes IDEA funds to states, and an LEA or school district (National Council on Disability, 2018). Monitoring and technical assistance are a state's primary vehicles for providing educators, administrators, policymakers, and the parents and families of children with disabilities, with information on effective practices for meeting the needs of children with disabilities and their families (U.S. Department of Education, 2006).

In 2014, the Office of Special Education Programs (OSEP) shifted its accountability system to emphasize achieving improved results for children with disabilities, beyond a historic focus primarily on compliance indicators. This strengthened accountability system – known as results-driven accountability, or RDA – combines a focus on measurable and meaningful outcomes in learning and development for students with disabilities, while still adhering to the compliance requirements of IDEA. States are required to develop and implement a State Systemic Improvement Plan (SSIP) that details how the state will improve outcomes for children with disabilities in specific areas and in collaboration with stakeholders. The SSIP may include a plan for technical assistance to districts on the development and implementation of IEPs. RDA changed the role of the SEA and the structure of monitoring systems to focus on capacity building rather than merely compliance (Howley & Sturges, 2018; Gross, Jochim, Nafziger, 2013; Korobkin & Meller, 2019).

Monitoring is the process by which an SEA uses quantifiable indicators to measure adequate implementation of IDEA. When states monitor LEAs' implementation of IDEA, regulations require that they focus on improving educational results and functional outcomes for all children with disabilities. Monitoring must also ensure that public agencies meet the program requirements under IDEA, with an emphasis on improving educational results for children with disabilities (34 CFR §300.600).

Technical assistance (TA) often occurs as part of the monitoring process and afterwards as part of a district's improvement plan. Technical assistance means support in identifying, selecting, or designing solutions based on research, assistance in data and evaluation, and other help to encourage and improve teaching and learning using techniques supported by research (20 USC §9501(23). Technical assistance is a process by which service providers help agency staff to pursue targeted organizational improvement (Howley & Stuges, 2018), and may include the provision of advice by experts, including explicit plans for addressing the area of concern; assistance in identifying and implementing evidence-based practices; and collaboration with institutions of higher education or other TA providers (34 CFR §300.600).

Studies have found substantial variability in the nature and design of state monitoring systems (National Council on Disability, 2018). In performance-based monitoring systems LEAs are selected for monitoring based on specific performance criteria. In schedule-based systems, monitoring occurs on a set schedule regardless of performance. Data from a 2010 survey showed that state officials find performance-based systems most efficient because they allow resources to be directed to local program most in need (Bollmer et al., 2010). Many states also create criteria that includes LEAs selected at random or selected because of their size to ensure the state isn't monitoring the same LEAs every year (Bollmer et al. 2010). The state or the LEA can be designated as the entity primarily responsible for implementing the monitoring process. State officials report that including a self-monitoring component promotes local ownership of the improvement process, helps relieve the state of the burden of data collection and root cause analysis, and ensures that more LEAs can participate in the monitoring process each year (Bollmer et al., 2010).

Unfortunately, the research literature on special education monitoring and technical assistance is typically prescriptive rather than an empirical assessment of TA strategies or best practice (Howley & Sturges, 2018). Such literature typically draws on other disciplines such as improvement science, organizational theory, and change theory to posit best practices in technical assistance broadly – such as stakeholder input, use of data, and ongoing coaching (Hurth & Goode, 2009). It is reasonable to apply

best practices drawn from other technical assistance disciplines to the provision of special education TA. Maley and Eckenrode (2016) conducted a review of best practices in training and technical assistance for practitioners delivering evidence-based programs to youth across disciplines. The authors concluded that effective technical assistance should be:

- Collaborative, relationship-focused, and in-person
- Founded on active learning and developed in support of learner goals
- Individualized and tailored to meet the needs of the user depending upon their needs and their stage of implementation
- A process that included planning and discussion with ongoing and regular follow-up
- Full of opportunities for iterative practice
- Proactive as well as reactive

Early childhood

As recorded in the Strategic Plan, "intervening early with family-centered, evidence-based practices can change a child's developmental trajectory and improve outcomes for children and families" (MSDE, 2016, p. 14).

The Strategic Plan (MSDE, 2016, p. 14) provides an excellent summary of the literature around early intervention and the importance of a strong early intervention program, stating the following:

- We know intentionally engaging families as equal and informed partners supports families to know their rights, effectively communicate their child's needs, and help their child develop and learn.
- We know children learn best through natural learning opportunities in everyday routines and activities in home, community, and early childhood settings with typical peers.
- We know strong alignment across early childhood programs and systems creates seamless transitions to LSS/PAs. Ultimately, we know early childhood intervention and education works. The earlier services and supports are provided to a child and family, the greater the opportunity to close gaps.

Access, equity, and progress

IDEA not only requires that students with disabilities be educated in the general education classroom to the greatest extent possible, but that IEP teams discuss each student's access to the general education curriculum. A 2017 U.S. Supreme Court decision (Endrew F. v. Douglas County School District) reaffirmed the importance of access and also highlighted the right of a student to make progress when the court wrote that "to meet its substantive obligation under IDEA, a school must offer an IEP reasonably calculated to enable a child to make progress appropriate in light of the child's circumstances" (Endrew F., 2017, p. 15). The decision is notable because it rejected a lower court's decision in 2008 that a district must provide "merely more than de minimis" educational benefit for students with disabilities.

Unfortunately, when researchers look at access and progress, they often find that those students most in need of additional supports are not receiving them. Some researchers argue that categorizing and labeling students as students with disabilities lowers the expectation for their progress, resulting in differences in access to knowledge and attainment. The placement of students from diverse race and ethnicity backgrounds in special education may actually serve as a justification to continue educational inequities (Rocha & Hawes, 2009; Sullivan & Artiles, 2011). The U.S. Department of Education requires that each state examine whether students from specific race and ethnicity categories are overrepresented in special education, in specific disability categories, in more restrictive placements for receiving special education services, and in the number of times students are removed from school including by suspension or expulsion. LEAs identified as having significant disproportionality (as defined by each state) must publicly report on a review of policies, procedures, and practices and set aside federal special education funds to service students at-risk for, but not yet identified as, needing special education and related services (IDEA Part B, 2004).

The Strategic Plan (MSDE, 2016, p. 16) operationalizes the strong research base around access and equity including through statements including these:

- We know organizational structures that support school-wide collaboration for planning, teaching, and instructional decision-making, allow educators to assess student learning and align instruction to meet individual student needs.
- We know a school-wide integrated, tiered system of supports designed to meet the academic and social/behavioral needs of all students will reduce disparities in the identification, placement, and suspension/expulsion rates for students.
- We know that educators must increase the intensity and frequency of intervention and progress monitoring for those students whose performance is not on track with their peers.

MSDE technical assistance

MSDE has a well-documented, robust system for providing technical assistance to LSS/PAs. As described above, the Strategic Plan focuses on building the capacity of LSS/PAs and other stakeholders to narrow the performance gap and enable all students with disabilities to exit education career and college ready. The Differentiated Framework (see page 14) illustrates an evidence-based system for differentiating support.

The DEI/SES offered at least 46 different professional learning opportunities (PLOs) throughout the 2018-2019 school year, many of which were repeated regionally, or in at least two locations to increase opportunities for LSS/PA leadership to attend. Many were full-day, face-to-face events. For example, DEI/SES hosted a day-long PLO on Access, Equity and Progress that was repeated in each of the five regions. Some were shorter face-to-face or webinar events, including a 60-minutes Early Childhood Professional Standards Webinar, released in February for statewide use. See Appendix 8 for a complete listing of MSDE technical assistance offered in 2018-2019.

In addition to training events, DEI/SES also issues Technical Assistance Bulletins and Guidance Documents, which provide detailed guidance on legal requirements and best practices regarding specific

topics, and which typically include frequently asked questions. During the 2018-2019 school year, DEI/SES updated two guidance documents and published four Technical Assistance Bulletins that provide detailed information on the state's priority imperatives and reflect the relevant topics and research described in this report:

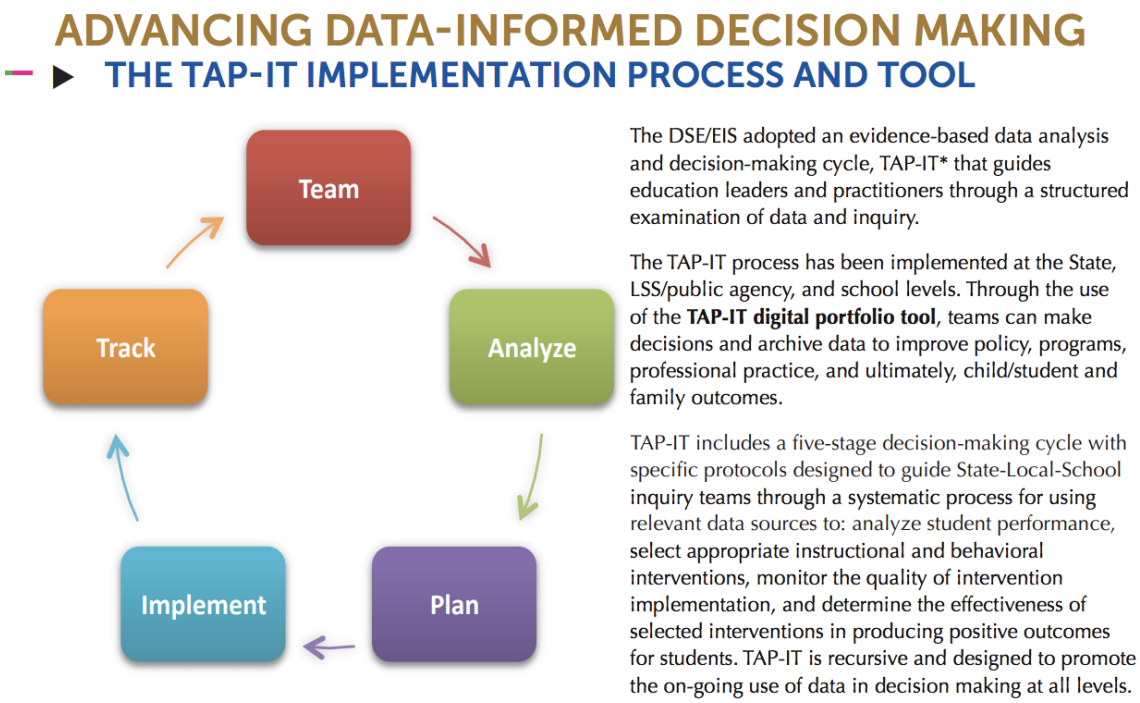
- Secondary Transition: Legal Policy, Implementation, Tools
- Improving Outcomes for Students with Disabilities Curriculum, Instruction and Assessment
- Student Behavior Interventions: Restraint and Seclusion (published with general education)
- Student Behavior Interventions: Physical Restraint and Seclusion – Supplement on Students with Disabilities
- Maryland Guidance for IEP Teams: Participation Decisions for the Alternate Assessments and Instruction Using Alternate Standards - Revised
- Assessment Crosswalk: Changes to the Maryland Guidance for IEP Teams on Participation Decisions for the Alternate Assessments - Revised

In addition to a significant number of training opportunities offered to LSS/PA leadership teams throughout the school year, the DEI/SES provides funding for each LSS/PA to implement district-identified strategies based on current data to improve results in each priority imperative using the Team, Analyze, Plan, Implement, Track (TAP-IT) process.

Team, Analyze, Plan, Implement, Track (TAP-IT)

As reported in Maryland's FFY 2017 Part B APR, TAP-IT "ensures purposeful resource allocation and collaborative effort in support of research-based actions that narrow the achievement gap for students with disabilities and their non-disabled peers" (MSDE, 2019). The TAP-IT process is used when the DSE/EIS reviews applications Local Priority Flexibility (LPF) Grants to ensure a more comprehensive effort that reflects the key strategies in the Strategic Plan. Through TAP-IT the DEI/SES participates in an implementation team with each LSS/PA. The team collects current, relevant data to determine specialized LSS/PA needs. The quantitative APR indicator data along with data for targeted areas for school improvement—mobility, attendance, discipline/suspension, and academics are then organized and used to support thoughtful study and research-based actions which are identified, monitored, and evaluated through the SEA/LSS/PA TAP-IT Process. Exhibit 23 provides a graphic representation of the TAP-IT process.

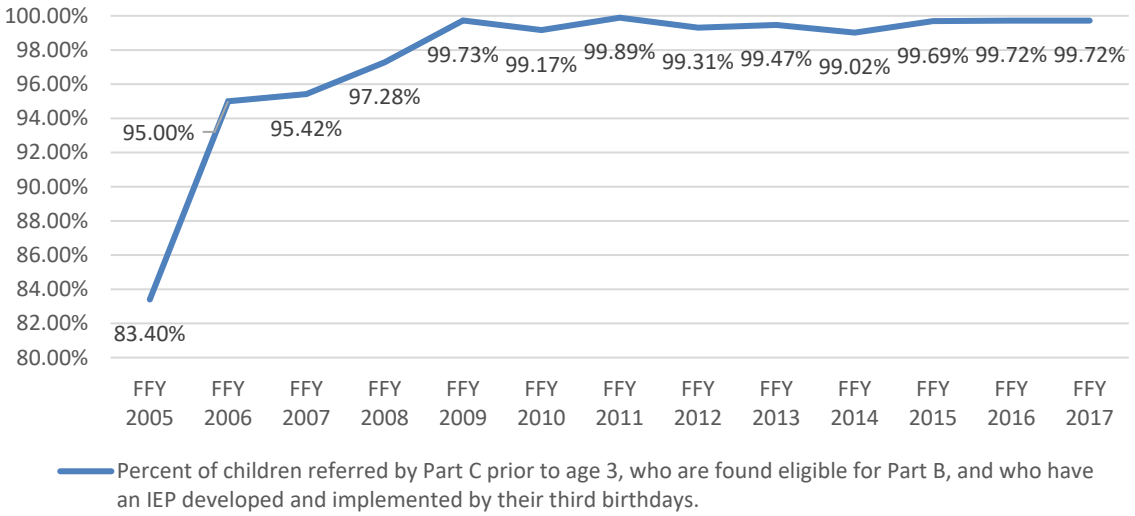
Exhibit 23. The TAP-IT Implementation Process and Tool



Early childhood

In addition to the supports and measures described from the Strategic Plan for this priority imperative, researchers identified additional evidence of a strong system of technical assistance. Maryland is one of only twelve states in the country where early intervention under Part C of IDEA, for children ages birth to three, is administered by the state department of education as the Lead Agency. This configuration enables better collaboration and a smoother transition from early intervention to preschool special education services for children at age three. MSDE staff reported, and researchers confirmed through the review of Technical Assistance Bulletins, that the systems for early intervention and early childhood special education are aligned. In addition, statewide data for APR Indicator 12 — the percent of children referred by Part C prior to age 3, who are found eligible for Part B, and who have an IEP developed and implemented by their third birthdays — show very high levels of compliance. As illustrated in Exhibit 24, Maryland has reported at least 99% compliance for this indicator for the last seven reporting periods. These data suggest that LSS/PAs are implementing the guidance provided by DEI/SES.

Exhibit 24. Statewide Early Childhood Transition Data from FFY 2005 through FFY 2017



Source: Maryland Annual Performance Report, Indicator 5 (MSDE, 2019).

Access, equity, and progress

The DEI/SES works collaboratively with other divisions within MSDE to improve performance on statewide accountability measures and achievement of the Maryland College and Career Ready Standards, as reported in interviews with MSDE staff and demonstrated in Technical Assistance Bulletin 19-01, Improving Outcomes for Students with Disabilities: Curriculum, Instruction and Assessment. That bulletin reinforces that, "For students with disabilities, both general and specialized education are required. A culture of high expectations must exist to prepare all students to succeed in college, career, and community life" (MSDE, 2019). However, the researchers observed that the joint guidance provided is led by DEI/SES and does not appear to be distributed to general education leadership by their respective leadership at MSDE. A scan of the materials made available by the MSDE Office of Leadership Development and School Improvement on its Resource Hub did not find materials that indicated promotion of cross-training with special education or information on how the resources provided could be applied to increase the quality of core and specially designed instruction for students with disabilities.

Secondary transition

In addition to the technical assistance provided by the DEI/SES, other state agencies in Maryland participate in interagency partnerships which are very strong with regard to secondary transition as a result of the other state agencies primarily serving adults. Partner agencies include: Division of Rehabilitation Services (DORS); Developmental Disabilities Administration (DDA); Behavioral Health Administration; and Department of Labor, Licensing and Regulation – Division of Workforce Development and Adult Learning. This inter-agency collaboration, a cornerstone of how children and youth with disabilities and their families are served, is further supported in Maryland by the existence of various councils and formalized partnerships, including the Developmental Disabilities Council, the

Maryland Coalition for Inclusive Education, the State Interagency Coordinating Council, and the Special Education State Advisory Council. To enhance the technical assistance that the DEI/SES provides directly to LSS/PAs for secondary transition and the other priority imperatives, it provides discretionary funding for training, focused technical assistance for teacher and family training module development, and family training and paraprofessional training through contracts with more than 40 organizations.

LSS/PA utilization of MSDE technical assistance

This section describes how LSS/PAs utilize MSDE technical assistance and disseminate MDSE resources within their jurisdictions to impact practice and improve results for students with disabilities. Researchers learned about LSS/PA utilization of MSDE technical assistance through interviews with LSS/PA special education directors, IEP chairs, and principals; and focus groups with LSS/PA special education directors, special education teachers, and general education teachers. Online surveys responses from IEP chairs, special education teachers and related services providers, and IEP chairs confirmed that many of the conclusions carry across LSS/PAs.

LSS/PA special education directors are very familiar with the Strategic Plan and can easily speak to the imperatives and strategies in the plan. At least half of the LSS/PA special education directors, either in focus groups or interviews, shared examples of how they have aligned their improvement or strategic plans to match the state's and apply the MSDE resources at a local level. LSS/PA directors have leveraged the strong priorities set by MSDE to attain support from within their LSS/PAs to work to improve outcomes and narrow the gap for students with disabilities. One director specifically stated that "[MSDE] tools help leverage conversations and engage new resources."

The importance of the three priority imperatives is reinforced systemically, since each LSS/PA applies for discretionary funds each year through the Local Implementation for Results (LIR) Plan and grant application and participates in in-person partnership meetings with DEI/SES staff to review the plans and application as described in the TAP-IT process. While some directors reported that this was a very meaningful process that occurs through teamwork with the state (as intended through the TAP-IT process), a few directors shared that the application process can be burdensome in proportion to a small amount of money and/or that it is frustrating to have such rigid requirements for discretionary funds.

LSS/PAs not only receive support through the data analysis and improvement planning processes, LSS/PA directors also reported that they participated in professional learning opportunities associated with each area of the strategic plan. One director shared that "we have been able to bring teams and hear from other LSS/PAs and had events with only directors – these have been helpful, too. Professional learning for me as a leader, and for my team. Very helpful."

LSS/PA special education directors also praised the written documents created by the DEI/SES. They reported strategically sharing them with staff, sometimes breaking them down into smaller pieces to ensure they were understood and implemented. In the regional local implementation lessons learned sessions, LSS/PA director interviews supported the conclusion that they were applying the technical assistance when they promoted improvements they have been seeing as a result of their focus on interagency partnerships and engaging stakeholders.

LSS/PAs use a wide variety of strategies to disseminate information about special education policies, practices, and guidance from MSDE, as determined through a review of each LSS/PA dissemination plan. Most of the districts disseminate technical assistance content to staff through regular staff meetings and professional development sessions for special education staff, both at the central office and school levels. Districts also post information online using Google drives, SharePoint sites, and websites; and send the information electronically by email and through newsletters.

Teachers and other professionals including IEP chairs, are not as aware of the Strategic Plan and priorities or the DEI/SES technical assistance resources as LSS/PA directors. Interviews with individuals during school site visits found that they did not mention the Strategic Plan or any technical assistance bulletins when asked about helpful resources. This was confirmed by survey data showing that under 20% of 490 IEP chairpersons provided a valid response to the open-ended survey question asking, "What tools or resources provided by MSDE have helped you better participate in the IEP process?" Sufficient data is not available to determine if those professionals had not been recipients of LSS/PA dissemination or if they simply were unaware of the sources of the resources that they received.

Early childhood

Early childhood programming was not raised as a concern by LSS/PA directors, special education, or general education teachers.

Access, equity, and progress

As reported above, the consistent, significant increase in the number of students with disabilities spending more than 80% of the day in the regular education classroom is an indicator that districts are applying the DEI/SES technical assistance and implementing strategies to address this imperative.

LSS/PA directors are also aware of the equity priority, with such awareness heightened in response to recent changes in MSDE's formula for calculating significant disproportionality (i.e., disproportionate representation of various student race/ethnicity groups in special education identification rates), wherein a majority of LSS/PAs —17 of 24 — are now identified as having significant disproportionality. Those LSS/PAs now must engage in an analysis to identify contributing factors and then use a portion of their federal IDEA special education funding to address the root causes and provide coordinated early intervening services. Most LSS/PA directors spoke about disproportionality and the revised formula in either a focus group or an individual interview.

Interviews with LSS/PA special education directors revealed that it can be difficult to influence general education teacher behavior when directives are coming from special education staff and not their general education counterparts at MSDE. One director reported that the "state expects us to engage non-special education partners and bring general education staff to trainings," but they have not been able to gain traction in convincing general education staff to participate in special education professional learning opportunities. It appears that efforts to conduct cross-division technical assistance are led by DEI/SES and LSS/PA general education leadership may not be incentivized or encouraged to attend by their relevant MSDE division.

Surveys of general education teachers also found that many (28.9%) report not being asked to provide input on the types and amounts of services the student will receive. 26.0% of general education teachers surveyed reported that the special education teacher did not consult with them in advance of IEP meetings even though 84.9% of special education teachers report consulting with general education teachers in advance of the meetings. 68.5% of general education teachers report that they consider themselves to be equal partners in planning students' educational services and 86.6% of special education professionals reported that they expect general education teachers to participate in decision making. (See Exhibit 25)

Exhibit 25. Online Survey Results about the Involvement of the General Education Teacher in the IEP Process

Survey Question	Response Group (n)*	Strongly Disagree	Disagree	Agree	Strongly Agree
I consulted with general education teachers or administrators in advance of the meeting on the child's progress or lack of progress to help them more fully participate in the meeting.	Special Education Professionals (n = 1,970)	5.2%	4.4%	29.0%	55.9%
The special education teacher consults with me in advance of the meeting on the child's progress or lack of progress.	General Education Teachers (n = 2,892)	8.7%	17.3%	33.6%	29.1%
I expect general education teachers to participate in decision making.	Special Education Professionals (n = 1,970)	5.0%	3.2%	26.5%	60.1%
I consider myself to be an equal partner with special education teachers and other professionals in planning the student's educational services.	General Education Teachers (n = 2,892)	6.0%	14.2%	34.2%	34.3%

* n size represents the number of valid responses for the complete survey. Because responses were not invalidated based on skipping a question, the n size for a specific question may vary.

Secondary transition

Post-secondary transition is complex, with multiple successful strategies as well as different challenges across the state. While some transition coordinators integrate transition into all activities and conversations with teachers and the IEP staff, there appears to be a wide range of practice based on responses given during the focus groups. Some schools have an integrated system, including regular involvement from outside agencies. Yet, in others, one person sits down with each transition-age student and completes the transition portion of the IEP, which is then inserted into the holistic IEP that was drafted before the meeting. Schools and districts with stronger transition programs shared several characteristics: 1) they developed individual plans for each student and had a range of possible trajectories, ranging from supported work readiness and life skills to college/post-secondary education and skilled/professional careers; 2) they partnered with community businesses, and agencies including DDA, DORS, community colleges and/or special programs to achieve transition goals; and 3) they had multiple sources of funding for transition activities.

To verify broad implementation of the technical assistance and guidance provided to LSS/PAs by MSDE, researchers reviewed a sample of transition goals, having created a random selection of 3% of the IEPs for students ages 14 through 21 in 2016, 2017, and 2018. This review of 2,221 IEPs for transition-aged students found that while the basic requirement of the federally-reported transition indicator (namely the presence of age-appropriate transition goals in the IEP) was met and was consistent with a high level of compliance (98.86% and 97.88%) as reported in the FFY 2016 and 2017 APRs, a deeper review found inconsistency in knowledge and understanding and/or implementation of secondary transition requirements in the IEP that appears to vary by district. Some school districts consistently wrote goals in the areas of education, training and employment, while other wrote goals in education and employment, for example. Some school districts consistently inserted “n/a” in this section of the IEP, while other school districts left one of the goal areas blank. Fewer than 20% of the IEPs across the three years included a measurable postsecondary goal in each of the areas of training, education and employment.

Conclusions and recommendations

This section describes the researchers’ associated conclusions and recommendations about the DEI/SES’s technical assistance system and how LSS/PAs utilize MSDE technical assistance. Conclusions and recommendations are addressed for both the state level of the MD education system as well as the local level, in order to provide guidance for improvement across the system.

Conclusion 1.1.1 (State System): MSDE DEI/SES has a robust system of technical assistance that provides useful support to LSS/PAs to improve results for children with disabilities. To increase the effectiveness of its technical assistance, MSDE should continue to further differentiate support to LSSs.

MSDE has a differentiated framework in place to provide individualized support to its LSS/PAs based on needs identified through a system that includes useful and timely data along with strong individual

relationships among DEI/SSES staff and each LSS/PA director. However, while the framework includes four levels of differentiated supervision and support, MSDE staff reported that 21 of 24 LSS/PAs fell into the minimum tier of supervision and support (Universal) for the 2018-2019 school year. One LSS/PA was in the second tier, (Targeted), and two LSS/PAs were placed in the third tier (Focused). MSDE should continue to operate this differentiated system, but can increase the power of the technical assistance offered through this system by streamlining mandates or supports for LSS/PAs that are doing well (as evidenced by their data) and increasing levels of support in those LSS/PAs whose data demonstrate more targeted or focused needs.

Recommendations

There are many ways the DEI/SES could consider differentiating support including the following four examples:

- Given the importance of universal high-quality core instruction, consider whether there are additional indicators that might be used to differentiate support. This could be done in collaboration with the school improvement programs administered by MSDE.
- For LSS/PAs that are doing well and demonstrating progress against the measures in the Strategic Plan, consider streamlining annual application and reporting processes to require fewer, prioritized indicators. Such streamlining could include a simplified Local Improvement Results (LIR) application for LSS/PAs who met their implementation goals in the previous year.
- Consider differentiating the funding amounts available for the LIRs based on results and progress data. While moving away from a formula-based distribution of funds may mean that every LSS/PA may not receive a proportionate share of funds for each of the imperatives, LSS/PAs that demonstrate readiness and a need for more intensive support may be able to make better progress if they receive additional funds under a prioritized, differentiated system approach.
- Review the availability of other resources that might be coordinated with the discretionary funds to increase the rate of progress.

Conclusion 1.1.2 (State System): MSDE DEI/SES has prioritized and successfully increased the number of children with disabilities placed in the regular education classroom for the majority of the school day. MSDE can improve its technical assistance to support these students in accessing the general education curriculum by coordinating more of its technical assistance across MSDE Divisions.

Maryland prioritized strategic collaboration as one of the five key strategies in the Strategic Plan and defined strategic collaboration to include across divisions within MSDE. Given the success of initiatives regarding inclusive practices and the increase in the number of students with disabilities spending most of their day in the regular education classroom, the researchers observed fewer opportunities and

resources for joint training across MSDE divisions than anticipated. While MSDE resources (including the Strategic Plan), encourage collaboration, the researchers did not observe evidence of implementation such as those present for other strategies in the plan, during interviews and focus groups with special education directors. One related example is the accurate guidance on Layering Funds to Blend Services provided on page 25 of the Strategic Plan (MSDE, p. 25). While LSS/PA special education directors spent a significant amount of time during the interviews discussing funding challenges including staffing challenges, no director mentioned this resource or reported that they were trying to create change in staffing or funding by layering funds.

Technical assistance in special education is unique because the quality of special education is deeply tied to the quality of a school's general education programming. Given the current focus on school improvement and the need to improve results for all students in many schools, a number of states are finding success when the State Superintendent or Board of Education require or encourage the creation of collaborative technical assistance and, in some cases, engaging in collaborative monitoring and general supervision work, with general education program colleagues at the state level.

Recommendations

All MSDE divisions should continue and increase their commitment to the prioritization of strategic collaboration, supported and prioritized by the MSDE State Superintendent and state board of education. While DEI/SES should continue to promote collaboration by developing resources and holding joint PLOs at all levels, especially with LSS/PA leadership teams, MSDE leadership should promote the collaborative work as a priority to LSS/PA general education leadership.

The reauthorization of IDEA in 2004 brought a new structure to the pre-referral process, or a restructuring of the way services were delivered to at-risk students and students with disabilities. This service delivery model evolved into several systems level approaches: Response to Intervention (RtI), Multi-Tiered Systems of Support (MTSS), Universal Design for Learning (UDL), and Differentiated Instruction (DI). These frameworks for prevention and effective teaching are founded on the need for high-quality responsive instruction in the general education environment.

Research suggests that differentiated instruction and responsive intervention frameworks work to improve student learning and prevent over-reliance on special education as a system of support for low-performing students. A meta-analysis of large-scale models of RtI found that RtI implementation leads to improved systemic and student outcomes and prevents the over-identification of students as eligible for special education (Burns, Appleton, & Stehouwer, 2005). A quasi-experimental study of 24 teachers and 479 4th graders of mixed ability found that students made more progress on reading and literacy when differentiated instruction methods were systematically employed – even when controlling for socioeconomic status (Valiandes, 2015). A research review of 13 studies evaluating the impact of Universal Design for Learning suggested that UDL-based instruction has the potential to help teachers meet academic needs of all students and to support the achievement of students with varied needs – but effect sizes ranged from small to large, with efficacy dependent upon fidelity of implementation (Ok, Rao, Bryant, & McDougall, 2016).

Conclusion 1.1.3 (State System): MSDE DEI/SES has provided high-quality guidance on evidence-based practices for teaching and learning. MSDE can continue to improve the use of these practices in the field, by developing strategies to bridge policy and practice to support broad and deep implementation with fidelity.

Researchers and Maryland special education and general education practitioners agree that DEI/SES' materials and resources are of high-quality and are consistent with both established requirements as well as best practices. However, there are challenges in translating the guidance provided to LSS/PAs into local practice by practitioners.

The DEI/SES addressed part of this challenge when it recognized that resources were not consistently distributed to the provider level and thus began requiring dissemination plans from LSS/PAs to describe how technical assistance resources would be disseminated. However, some evidence remains that additional work is needed to ensure that the practices required or recommended by MSDE are implemented at the local level with fidelity.

Recommendations

The challenge of implementing evidence-based practices — the gap between what is known to be effective from the research and the degree to which that research is put into practice — persists in both general and special education. One of the critical stages of translating research to practice is disseminating information on evidence-based practices. However, as Cook and Odom (2013) find, "evidence-based practices are primarily disseminated in traditional and passive ways (journal articles, research briefs) that hold little sway with the practitioners who actually implement the practices." Accordingly, a role the state can effectively play is to disseminate evidence-based practices in ways that are more meaningful and impactful, by ensuring approaches that are concrete, credible, and conveyed to help LEAs implement the practices over time. Intentional use of the teachings of implementation science (Sims & Ward, 2015) and improvement science (Bryk et al, 2015) at the state level could increase the likelihood of moving policy into practice and incorporating information from the practice level into ongoing planning to support implementation.

A commitment to leveraging such research to inform implementation of technical assistance support could be one way that the DEI/SES differentiates its work. LSS/PAs that are demonstrating implementation of action plans and that are demonstrating progress toward the state's goals may be sufficiently supported through the model in which LSSs/PA are responsible for local dissemination and implementation. However, LSS/PAs whose data indicate that they need additional support or intervention may benefit from the DEI/SES modeling or coaching on dissemination and training.

MSDE should collect additional implementation data from LSS/PAs to ensure that its technical assistance truly bridges the gap to teacher-level practice and to evaluate the impact of its technical assistance on teacher practice and student outcomes.

Conclusion 1.1.4 (Local System): Most Maryland students with disabilities are educated primarily in the general education classroom. General education teachers need additional training on how to effectively participate in the IEP development process as well as implement the IEP effectively.

While Maryland's LRE data show significant progress over the past twelve years, progress in gaining access to the general education classroom and curriculum has not yet led to a similar increase in academic outcomes for students with disabilities. This may be due to a lack of understanding about how to provide specially designed instruction and accommodations in the general education classroom.

Recommendations

General education teachers need additional training on how to effectively participate in the IEP development process and how to effectively provide instruction that implements the IEP in the general education classroom. Analysis of open-ended survey responses from general education teachers shows that general education teachers report wanting a bigger role in IEP development, including input on goals and services.

DEI/SES has provided guidance to support LSS/PAs in increasing this capacity through Technical Assistance Bulletins and PLOs. Maryland also participates as a partner states with the national K-8 technical assistance center to bridging general and specialized education through academic and behavioral supports, the SWIFT center. Four schools each in four LSS/PAs are participating in the project. As the project progresses through implementation, the researchers recommend strong evaluations to identify practices that should be scaled up at both the LSS/PA and state level.

Section 1.2. MSDE's technical assistance related to, and recommendations for, clarifying and simplifying the IEP process to enable parents and guardians to more easily understand their rights and responsibilities in the process

This section of the report focuses specifically on technical assistance about the IEP process and whether Maryland's IEP process is can be clearer or simpler to enable families and ensure they understand their rights and responsibilities. This section presents data on the perceptions of both families and professionals about the IEP process and the parent or guardian's role in the process.

This section also includes the researchers' assessment of the Family Support Services provided by MSDE and LSS/PAs.

After a description of what researchers observed at the state and local levels, this section provides both state and local conclusions with recommendations based on best practices including the best practices observed in the state by the researchers.

Research questions

Research questions for this focus area:

- Do parents understand their rights and responsibilities in the IEP process?
- Do general and special education teachers understand the importance of and value families as a partner in the IEP process?
- Do MSDE IEP forms require information that is not required by the Individuals with Disabilities Education Act (IDEA)?
- Do MSDE IEP forms result in an IEP document that stakeholders can understand in order to exercise their rights and responsibilities, including for: families; special education teachers and related services providers; and general education teachers?
- What recommendations do IEP team members have for improving the IEP process?
- What are Family Support Services and how are they provided to families?
- Are there data that demonstrate the effectiveness of Family Support Services?

Literature review and best practices

The IEP is the heart of the education of a student with disabilities. The IEP was first put into place when Congress signed into law the Education of All Handicapped Children's Act (EAHCA, Public Law 94-142) in 1975. The EAHCA was later amended as the Individuals with Disabilities Education Act (IDEA). The IDEA requires all eligible students with disabilities to receive a Free Appropriate Public Education (FAPE) (Yell, 2016). FAPE must meet the individual needs of students with disabilities via an IEP which is developed by school personnel along with the student's parents. Students' IEPs are so critical that they are often at the center of special education disputes in hearings or courts (Bateman, 2011). Courts have been involved to settle differences regarding the definition of FAPE and the process of developing, implementing, and monitoring the IEP.

The 2017 Endrew F. Supreme Court decision confirmed the importance of the IEP and created a new standard for IEPs that ensure children will make meaningful progress. It also emphasized the central role of parents in the development of the IEP (Endrew F. v. Douglas County School District). Other due process hearings and court cases have also confirmed the critical importance of meaningful parent involvement in IEP meetings, with increased parent involvement correlated with higher attendance and graduation rates for students (Landmark, Zhang, & Montoya, 2007). However, parents and teachers report barriers to participation in the IEP process such as lack of knowledge, communication challenges, and work-related time constraints (Landmark, et al., 2007; Cavendish & Connor, 2018). Given the critical importance of parent participation in IDEA compliance and improved student outcomes, state education agencies can provide technical assistance to LEAs to support them in efforts to improve meaningful parent participation.

IDEA requirements

The IDEA regulations outline parent participation in the meeting and understanding of all information presented as critical features of the IEP process (Bateman & Linden, 2012; Yell, Katsiyannis, & Losinski, 2012). Per IDEA, LEA personnel must ensure parental participation by (a) providing adequate notice of the meetings; (b) scheduling the meeting at a mutually agreed upon time and place; (c) informing the parents of the purpose, time, and place of the meetings and who will attend by district request; and (d) informing the parents of their right to bring others of their choice to the meeting (34 CFR §300.322). If a parent cannot attend the meeting the LEA must use other methods to ensure parent participation, including phone or virtual participation (34 CFR §300.328). If a parent cannot participate because of a language barrier the LEA must provide appropriate interpretative services (34 CFR §300.322).

In addition, prior to the actual IEP team meeting, parents must receive notice and provide written consent for individualized testing of the student if appropriate and necessary. Any assessment data presented during the meeting by the IEP team should include results from a student's individualized testing, other standardized tests' results, classroom grades, work samples, and observations from teachers and other service providers (Bateman & Linden, 2012). The assessment data should be used to guide the writing of the student's present levels of academic and functional performance, and the corresponding measurable goals. IEP teams must provide a copy of the IEP to the parent and determine a process for monitoring and reporting the student's progress on IEP goals to the parent.

Despite these well-intentioned regulations, research on parent perceptions of IEP meetings suggests that some still feel like passive recipients of information rather than collaborators in the educational programs of their children (Childre & Chambers, 2005). In a survey of 51 parents whose children qualified for special education in a variety of eligibility categories, results from a study by Fish (2008) suggest that educators could improve IEP meetings by further educating parents, granting sufficient time to conduct meetings and allowing for increased parental involvement and participation by creating a welcoming atmosphere, ensuring that family members have a familiar relationship with at least one other IEP team member, and encouraging parents to engage a knowledgeable advocate.

MSDE policies, procedures, and practices

This section of the report describes the technical assistance that MSDE provides to Maryland LSS/PAs about the IEP process and how to engage with families through the process. MSDE makes family support funds available to all districts annually to design and implement family support services and requires districts to submit an annual application describing the family support services it will offer, as well as submit a dissemination plan for any guidance or technical assistance. This approach ensures information is received at the appropriate levels of the system including administrators, general education teachers, special education teachers, related services providers, family support coordinators, SECAC members, and students with disabilities and their families.

Survey data on professional development and technical assistance from IEP chairs in special education and general education teachers is provided in Exhibit 26. While IEP chairs agree or strongly agree (84.9%) that special education teachers have access to clear information about how to develop, implement, and monitor IEPs, only 60.8% report that they received professional development on how to involve parents in the IEP process.

Exhibit 26. Online Survey Results about Professional Development

Survey Question	Response Group (n)*	Strongly Disagree	Disagree	Agree	Strongly Agree
Special education teachers in my school have access to clear information about how to develop, implement, and monitor IEPs.	IEP Chairpersons (n=490)	2.7%	5.1%	31.0%	53.9%
I have received professional development this school year to help me involve parents in the IEP process.	IEP Chairpersons (n=490)	9.2%	22.7%	34.1%	26.7%

* n size represents the number of valid responses for the complete survey. Because responses were not invalidated based on skipping a question, the n size for a specific question may vary.

While some professionals may not be aware of the materials specific to the IEP process, MSDE makes resources available to both professionals and families through the MOIEP website and portal including training modules, sample IEPs, the most relevant technical assistance bulletins, and other print resources. These resources are accessed by all types of stakeholders and enable special education administrators, teachers and service providers to develop an IEP that is compliant and meets all the IDEA and COMAR requirements for IEPs. The MOIEP has help features and error checks built in to ensure appropriately completed IEPs.

As reflected in the Strategic Plan and reported by MSDE staff, communication with families and family support services staff is a high priority within DEI/SES's overall technical assistance and monitoring framework. The DEI/SES provides support, technical assistance, and guidance to LSS/PAs on family support services through a comprehensive and integrated approach that includes an annual reporting process and differentiated monitoring and performance support. The entire DEI/SES framework to provide performance support and general supervision is described in the first report. Additionally, LSS/PAs must address family partnerships thoroughly for each of the three imperatives in the Strategic Plan (early childhood, secondary transition, and access, equity, and progress) to receive their discretionary grants in the Local Application for Funding (LAFF). The DEI/SES family support services team provides grant funding and training to partially support the position of family support service coordinator, sometimes known as "Partners for Success," in each LSS/PA. This team also monitors the grants, to address the alignment and implementation of family support services across grant initiatives. It appears that grants are made equally across LSS/PAs and are not differentiated based on LSS/PA demographics or need, as demonstrated by LSS/PA data.

Throughout the year, at regional and statewide meetings, as well as in individual interactions, the DEI/SES guides LSS/PAs to comprehensively plan how to build and improve their local systems by identifying strengths and challenges in their LSS/PAs and engaging stakeholders in the process. As LSS/PAs complete the required steps of planning and reporting, DEI/SES stresses the expected outcomes of improved family support services to meet the goals stated above. Required planning steps focus on developing goals, identifying strategies and evidence-based practices, and identifying available resources and a budget. Finally, districts are required to describe how they will track progress toward meeting their goals. The DEI/SES resource management team requires the completion of an annual report containing this plan as part of the annual application for funds.

DEI/SES has a dedicated Family Support Services Section with staff that engage directly with families and have created high-quality, parent-friendly documents for families on their rights and responsibilities, procedural safeguards, dispute resolution options and other resources. During IEP meeting observations, researchers observed the use of audio files created by MSDE that explain procedural safeguards. MSDE regularly disseminates these resources to the LSS/PAs for further dissemination to school professionals and to families. One such service developed, encouraged, and offered through the Family Support Services Section is facilitated IEP team meetings, which are available across the State.

An independent facilitator, requested by either the parent or the school, is intended to help parents and school personnel avoid misunderstandings or disagreements when it is believed that discussions at the meeting may become challenging. It is not mediation, and parties must agree to participate.

Independent facilitators are trained volunteers from a community mediation center. They have completed a 50-hour training course in mediation skills, have experience mediating a variety of disputes, and have completed a 3-day training in IEP Team Meeting Facilitation. The independent facilitator is not a member of the IEP team and does not have a relationship with the school or the parents, other than to assist in the meeting. The independent facilitator remains neutral and focuses on the process while the team makes the decisions.

In addition to positive reports about the quality and usefulness of the materials from parents and professionals, even if they could not identify MSDE as the author, the use of the dispute resolution system provides additional evidence that parents understand their rights. See Exhibit 27, created from data reported from DEI/SES to the U.S. Department of Education for the 2017-2018 school year.

Exhibit 27. Family Use of DEI/SES Dispute Resolution System

Dispute Resolution Mechanism	Total Number Filed in 2017-18 School Year
Written, Signed Complaints	189
Mediation Requests	342
Due Process Complaints	277
Expedited Due Process Complaints (related to disciplinary decisions)	1

MSDE has policies in place to support the IDEA intention that parents are fully informed and equal partners in the education process for their children with disabilities. Policies include timelines for notifying parents about meetings, and for providing accessible information prior to meetings and after the meetings. Consistent with IDEA, MSDE has policies about ensuring prior written notice so that parents are fully informed of any service that the district is proposing or refusing to implement, for understanding the alternate assessment and alternate standards process, and the implication for graduation requirements.

The DEI/SES engages family stakeholders and advocates in all relevant decision-making. The agency goes beyond the requirement to have a statewide advisory panel, the Special Education State Advisory Committee (SESAC), further requiring each LSS/PA to have a local Special Education Community Advisory Council. MSDE provides annual funding to enhance the supports and services of the federally funded Parent Training and Information Center, Parents Place of Maryland.

LSS/PA policies, procedures, and practices

LSS/PAs are required to submit a local plan to disseminate and implement "Significant Guidance Documents" received from DEI/EIS to staff and stakeholders, including families. LSS/PAs use a wide variety of strategies to disseminate information about special education policies, practices, and guidance from MSDE. Researchers reviewed each LSS/PA's dissemination plan and found that most of the districts report a plan to disseminate content to parents through SECAC meetings, newsletters, direct emails, and by posting it on parent resource sites. A smaller number of districts also use social media to disseminate information to parents.

In addition to disseminating MSDE-developed resources, LSS/PAs have other practices in place to help parents understand the IEP process and their rights and responsibilities. (For additional information on these mechanisms and a review of MSDE DEI/SES' Family Support Services please see the Family Support Services section in Report 2.)

Data from the annual DEI/SES parent survey indicate that most parents are satisfied with the efforts LSS/PAs take to involve and engage families. In its FFY 2017 report, the state reported that 81% of preschool families and 69% of school-age families agreed that schools facilitated parent involvement as a means of improving services and results for children with disabilities. Exhibit 28 provides the data from the small online survey of parents and is not as favorable.

Exhibit 28. Online Survey Results from Parents about the IEP Process (n – 190)

Survey Question	1 Does Not Help	2	3	4	5 Greatly Helps
How well does the IEP Process help to meet the goal of what you expect from your child's education?	17.0%	15.7%	30.2%	22.6%	14.5%
Survey Question	**1 Not Equal**	**2**	**3**	**4**	**5 Equal Partner**
How well does your child's school ensure you are an equal partner in the IEP process?	22.2%	17.0%	20.0%	16.3%	24.4%
Survey Question	**1 I felt completely satisfied that my input was heard**	**2 I felt my input was heard to some degree**	**3 I did not feel heard at all**		
To what extent do you feel your input was heard at the most recent IEP meeting for your student?	32.8%	42.5%	23.1%		

* n size represents the number of valid responses for the complete survey. Because responses were not invalidated based on skipping a question, the n size for a specific question may vary.

** The researchers recognize that these data represent a very small snapshot of Maryland parents who were provided the survey by members of LSS SECACs and considered the lack of a representative sample when making the conclusions in this report.

Surveys of professionals demonstrate an understanding that parents are equal partners in the IEP process and that this understanding has permeated across both special education and general education teachers in the state. In a survey of 2,892 general education teachers and 1,970 special education professionals representing 19 LSS/PAs, most teachers and professionals agreed that that understanding translates to practice. Survey results related to the role of parents are reported in Exhibit 29.

Exhibit 29. Online Survey Results from Teachers and Professionals about the Role of Parents in the IEP Process

Survey Question	Response Group (n)*	Strongly Disagree	Disagree	Agree	Strongly Agree
I expect parents to participate in decision making.	IEP Chairpersons (n=490)	2.4%	0.2%	15.3%	74.9%
I consider myself to be an equal partner with the family, teachers, and other professionals in planning educational programs.	IEP Chairpersons (n=490)	3.1%	2.0%	27.6%	60.2%
I consider families to be an equal partner with teachers and other professionals in planning educational programs.	Special Education Professionals (n = 1,970)	4.5%	1.4%	18.5%	70.8%
I ask for families' opinions about how well special education services are meeting their child's needs.	Special Education Professionals (n = 1,970)	4.5%	6.2%	32.3%	51.5%
I expect parents to participate in decision making.	Special Education Professionals (n = 1,970)	4.4%	1.0%	20.7%	69.0%
I expect parents to participate in decision making.	General Education Teachers (n = 2,892)	2.5%	1.8%	32.4%	51.6%

* n size represents the number of valid responses for the complete survey. Because responses were not invalidated based on skipping a question, the n size for a specific question may vary.

The researchers found that the effectiveness of family support services is largely dependent on how those resources are implemented by each LSS/PA. While each LSS/PA has a plan in place, too few

parents and school personnel specifically reported utilizing family support services to enable conclusions to be drawn about how these services were accessed and whether they contributed to higher family engagement in the IEP process and less formalized conflict between parents and school systems.

Family Support Services Coordinators

Family Support Services Coordinators are typically parents of children with disabilities who receive early intervention and special education services, who are hired and trained by the school district to support families. They are often employed part-time and are typically funded through a combination of federal and state special education funds that MSDE allocates to LSS/PAs, along with local funds to supplement their services. Through a combination of workshops, events, one-on-one supports, and creating networking opportunities for parents, the Family Support Services Coordinators serve as a bridge to facilitate relationships between schools and families of children who receive special education. In addition, Family Support Services Coordinators may attend IEP meetings as a support mechanism, not in the role of an advocate, when invited by parents.

The amounts of funding and staff allocated to family support services and the roles of the family support services coordinators vary significantly across LSS/PAs, as learned through interviews and focus groups conducted with coordinators, directors, and DEI/SES personnel. In some LSS/PAs, Family Support Services consist of one parent educator working part-time to serve the entire LSS/PA. In other cases, LSS/PAs fund Family Support Services Centers staffed with five or six trained parent educators and host regular trainings and social events for families. In some districts, the Family Support Services Coordinator's role has expanded over time. One LSS/PA special education director reported adding a social worker to the LSS/PA's Family Support Center staff. Another director explained:

"For many years, it was two part-time staff who sat in the room and answered phones and were not well directed and did what they [were] told. Five years ago, they retired, and we decided to do it differently. Now we have six people (three parents, three former educators) assigned in pairs, each to a third of the county. [Their] job is to be in the schools supporting families. They get referrals from staff, or parents call directly. Sometimes it is all about 'What is special education?' Sometimes the families are angry and need a partner to listen and observe. [We have] events twice a year. 100% of the cases that came to them went nowhere else," meaning that they did not escalate their complaints to a formal level.

Strategies for Reaching Parents and Families

Effective family engagement practices not only provide training and resources, but also:

- Build positive relationships and establish effective communication between home and school,
- Ensure effective collaboration and problem-solving as a way of working together,
- Provide opportunities for families to increase social capital and social networks, and
- Provide direct support to families including training and educational opportunities (Christenson & Reschly, 2010; Clarke, Sheridan, & Woods, 2010; Cox, 2005; Henderson & Mapp, 2002; Marcon, 1999).

The researchers reviewed evidence that LSS/PA family engagement practices go beyond training to include relationship building, even though the primary family support activities involve providing information, support, and outreach to parents. Analysis of activities documented by LSS/PAs and reported to MSDE for fall 2018, based on DEI/SES's internal statewide data, reveals that nearly half of these activities (47%) are listed as generic support contacts for resources and services or family support services.

Family Support Services Coordinators reported using information, training, and written resources from MSDE, LSS/PAs, and parents to develop materials of their own and advise families of workshops and activities. With regular training from DEI/SES and the ability to call state Family Support Services staff to get information on unique problems, they offer accurate information to families in a way that families find non-threatening and understandable. Workshops range from information on the IEP process to specialists presenting on specific disabilities, to financial planning and transition. Requests for workshops on behavioral issues have increased in recent years.

Family Support Services Coordinators report that their most important role is to facilitate the relationship between schools and families. One coordinator commented:

"I've seen it to be effective when you do have that connection with that one family because you can see where the parent starts to build up their confidence level. Whereas before where they weren't as comfortable, now they're very comfortable, because they've been coming to workshops, they've been coming to support groups, so they now feel free to speak and don't feel as intimidated with the process."

The numbers of families served through these efforts vary greatly across the LSS/PAs. From questionnaires completed by 16 of 24 LSS/PA family support services coordinators, responses to the request to provide the number of families they supported varied widely, from 10 or more families directly, to 2,700 directly and "thousands indirectly," likely through newsletters and other dissemination of information.

Conclusions and recommendations

This section describes the researchers' conclusions and recommendations about the DEI/SES's technical assistance related to the IEP process and how parents understand and navigate the IEP process. As in the first set of conclusions and recommendations above, researchers address state and local system levels.

Conclusion 1.2.1 (State System): MSDE develops and disseminates high-quality information to families about the IEP process, making the process clear and navigable.

MSDE DEI/SES Family Support Division has developed and regularly disseminates a comprehensive set of resources and materials for ensuring that educators and families understand and can utilize their rights and responsibilities in the IEP process. Resources are made available to LSS/PAs who in turn are

expected to further disseminate them, and they do so through a variety of mechanisms as reported on dissemination plans submitted to the state. However, from the MSDE webpage, it is not easy to find support materials for families. On the Family Support Services page, materials for families are not easily located, with the only obvious resources appearing to be the family support contacts in the LSS/PAs and frequently asked questions about facilitated IEP meetings.

Recommendations

MSDE should continue to increase the reach of its materials by disseminating materials directly to families in addition to doing so through LSS/PAs. MSDE can increase its reach by providing direct resources for families on the family support page of the DEI/SES website, prioritizing the following resources as a starting place:

- Links to specific sections of MD Learning Links
- Procedural safeguard booklet and the audio files

In addition, MSDE should continue its strong reputation for high-quality materials development by continuing to produce resources for families. Considerations for additional resources that may be useful include the following:

- Consider making videos to support procedural safeguards in addition to the audio files
- Create “plain language” question and answer documents about basic IDEA processes: evaluation, reevaluation, IEP, and transition planning
- Provide links to additional support organizations that can assist families to understand the IEP process and increase promotion of the inclusion of stakeholders in MSDE decision-making processes

Conclusion 1.2.2 (State System): The Maryland Online IEP system provides a valuable tool across the state that facilitates consistent and compliant IEP development. However, the final printed product can be overwhelming to families and other IEP team members.

The Maryland Online IEP system is a valuable resource for all parties in the special education system and provides valuable data to MSDE. However, use of the online IEP system may complicate the IEP process for families by delaying receipt of a final IEP beyond the end of the IEP meeting and by creating a printed product that is not user-friendly for families or for special and general educators implementing the IEP. Researchers reviewed printed IEPs including best practice samples created for training, that were up to 32 pages long.

Responses from both parent and professional surveys provided interesting data -- many think IEPs are too long and other think IEPs are too short. DEI/SES should work with LSS/PAs to ensure that the IEP length meets the needs of the IEP team and its members. Additional conclusions about the Maryland Online IEP data are included in Chapter 2.

Recommendations

MSDE should consider refining the IEP tool to simplify the final printout provided to families and general education teachers to ensure it is readable and usable. Convene stakeholders including teachers and families to inform the desired paper product. When refining the process, consider the following feedback provided by professionals and parents through the study:

- Eliminate content in the final printed version that does not apply to each specific student, for example a third-grade student does not need high school assessments listed or a blank transition plan on the printed IEP
- Allow electronic signatures so that IEPs can be printed at the IEP meeting more quickly
- Adjust the order of content to flow smoothly and in line with MSDE guidance provided to families in Building IEPs with Maryland families, what a great IDEA! A guide to developing, implementing and reviewing IEPs for students with disabilities
- Remove any redundancies that exist, (e.g., duplication of the same information that is necessary now only because the printed document is so long)
- Create simple summary printouts to accompany the full printed IEP, designed specifically for parents and for general education teachers

Multiple parents and professionals recommended a requirement that the online IEP system be broadcast for viewing during IEP meetings to facilitate equal access to information by all team members. When only one person can see the changes being made to the IEP, it does not contribute to the feeling of being equal partners.

Conclusion 1.2.3 (Local System): Each LSS/PA has a plan with intentional, coordinated strategies for family support services and dissemination, submitted to and reviewed by MSDE annually.

The plans submitted through the Local Improvement Results (LIR) planning process are valuable and reinforce the key strategies from the Strategic Plan including strategic collaboration and family partnerships. LSS/PAs are required to include family support coordinators and encouraged to consider local families in developing the LIR Plan for Family Support Systems (see LIR applications available on the MSDE website). The required planning and review processes ensure that each LSS/PA, is reviewing data and considering how it can better serve families to help them understand the IEP process and their rights and responsibilities. By making dedicated funds available based on the plans, MSDE demonstrates its dedication to and the importance of family support services to LSS/PAs.

Recommendations

Continuing to at least annually assess needs for resources and training for both staff and families on the IEP process (MSDE recommends quarterly team meetings) will increase the extent to which families and all staff are engaged meaningfully in the IEP process. Consider specific training for both staff and families about each section of the IEP and why the content in each section matters, best practices in facilitating

IEP meetings, seeking input from families, and planning strategies to support successful collaboration among general and special educators.

Continue to update the dissemination plan submitted to MSDE and consider extending its usefulness as an action plan within the LSS/PA to assign responsibility, timelines and conduct evaluation of dissemination efforts to continuously inform and improve the process.

Conclusion 1.2.3 (Local System): IEP teams want to develop effective and meaningful IEPs in partnership with families and will need continued guidance and best practice information to do so.

All members of IEP teams providing data through this study reported that IEP teams consider student needs and are equal partners in determining what a student needs in order to progress in their educational goals. Ongoing guidance and training at the LSS/PA and school level is needed to ensure that IEP teams are provided with tools and resources to make the IEP process as efficient as possible.

Recommendations

Continue to provide ongoing training and support for all IEP team members on best practices in IEP development which could include content development of various sections, time management, case studies, suggestions for successful parental input, managing virtual meetings when parents attend remotely, and many others.

Special education professionals and general education teachers responded to the survey prompt: “One thing I would change about the IEP process in my local school system”

Responses were reviewed for themes and grouped accordingly. Eight themes were identified. The number and percentage of responses by general and special education are displayed in Exhibit 30, further below. Specific suggestions from IEP team members are listed here:

IEP meeting administration

- Broadcast the IEP so all attendees can view the screen and make changes during the meeting.
- Review the IEP document and remove any repetition (e.g. places where information is copy/pasted multiple times) and redundancies (e.g. sections for older children when the IEP is for a preschool student) to make it easier to complete and easier to read. Review additional paperwork such as five-day notices and policies to ensure they are necessary.
- Ensure all IEP documents are available online to school-based team members, consider combining the IEP and IFSP online systems.
- Schedule and provide notice of meetings in advance.

IEP team membership, communication, and collaboration on IEP development

- Create a standardized form for feedback from general education teachers or ensure that all schools have access to existing input forms. Ensure all teachers can give input in middle and high school.
- Provide time for general education teachers and special education teachers to meet and prepare for the meeting including collaboration on goals and services. Include other team members in the pre-meeting if possible.
- Consider including paraprofessionals as a member of the IEP team or providing a venue for paraprofessionals to give input before IEP meetings.

Exhibit 30. Recommendations from Special and General Educators to Improve the IEP Process

Special Education Professionals: Number/Percent of Responses	Survey Question: One thing I would change about the IEP process in my local school system. Themese as derived by researchers.	General Education Teachers: Number/Percent of Responses
623/48%	IEP meeting administration (scheduling, meeting length, paperwork burden, facilitation)	533/32%
190/15%	IEP team membership, communication, and collaboration on IEP development	470/28%
213/16%	Parent and student involvement	221/13%
60/4%	Referral and assessment	151/9%
17/1%	IEP Implementation	105/6%
126/9%	Personnel shortages and caseload	103/6%
42/3%	Services, accommodations, and access to core instruction	46/3%
39/3%	Professional development and staff competency	39/2%
1310	Total	1668

Section 1.3. Modify the administrative goals, objectives, and strategies of teachers and IEP teams to make them more efficient

While the IEP process is highly regulated by IDEA and state rules and regulations, states and LSS/PAs have some flexibility in developing strategies for making the IEP process more efficient. This section provides a literature review and summary of promising practices that reflect the researchers' review of the administration of the IEP process in Maryland including its relationship to teacher retention and teacher caseload and the delivery of special education and related services in an increasingly inclusive environment. After a description of what researchers observed at the state and local levels, this section provides both state and local conclusions with recommendations based on best practices including the best practices observed in the state by the researchers.

Research questions

Research questions for this focus area:

- Are there COMAR requirements that go beyond what is required by IDEA?
    - If yes, is the benefit of the additional requirement worth the cost of additional time and recordkeeping?
- Does MSDE guidance include guidelines or recommendations that go beyond what is required by IDEA?
    - If yes, is the benefit of the additional requirement worth the cost of additional time and recordkeeping?
- Do stakeholders perceive that the IEP process in Maryland is efficient?
- What barriers exist to efficient delivery of special education and related services?

IDEA Requirements

IDEA governs the education of students with disabilities nationally, but it also provides room for states to develop their own policies and procedures for meeting or exceeding the minimum standards outlined in the federal law. For example, a state could require an evaluation be completed in 45 days rather than the 60-day time limit for evaluations outlined in IDEA. States also have flexibility in how IEP documents and related notices are structured, such as the notice of parent procedural safeguards. This flexibility means that states and districts can evaluate context-specific policies and procedures to ensure they are efficient and provide transparency for the IEP team, including parents.

The special education teacher is a core member of the IEP team and a critical actor in the provision of FAPE to students with disabilities under IDEA. To receive an IDEA grant, each state must sign an

assurance that it has established and maintains qualifications to ensure that personnel are appropriately and adequately prepared and trained, including that those personnel have the content knowledge and skills to serve children with disabilities (34 CFR §300.156). Under IDEA, special education teachers must obtain full state certification as a special education teacher, including certification obtained through alternative routes that meets requirements under 34 CFR §300.18(b)(2). LEAs are tasked with hiring and retaining a sufficient supply of qualified special education teachers to meet the FAPE requirement for all students with disabilities residing in its jurisdiction. Shortages of special education teachers may threaten an LEA's ability to comply with the requirements of IDEA (West & Hardiman, 2012).

Literature review and best practices

Special education is the teaching field with the greatest teacher shortages (Smith, 2019). Retention of special education teachers and other special education professionals impact an LEA's ability to fully staff its special education departments and develop high quality IEPs. Newly hired special education teachers are 2.5 times more likely to leave teaching compared to beginning general education teachers (Leko & Smith, 2010). Unreasonable work assignments (high caseloads, paperwork) are a primary factor in special education teacher attrition (Billingsley, 2004; Hagaman & Casey, 2018).

Findings from a critical analysis of the research literature by Billingsley (2004) suggest that unreasonable work assignments will continue to affect the rate of attrition despite policies that aim to provide support to beginning teachers. In other words, providing mentorship and professional development will not keep a special education teacher in a job that is unreasonable. Studies find special education teachers with low salaries, poor school climate, lack of administrative support, and role problems have negative affective reactions (i.e., high levels of stress and low levels of job satisfaction) that lead to attrition (Billingsley, 2004). Conversely, special education teachers with higher salaries, high quality mentoring programs, decision making power, administrative support, positive school climate, and balanced job designs (limited paperwork, access to paraprofessional support, time for collaboration and curriculum development) are more likely to stay (Muller, 2010).

Special education teachers, especially those new to the profession, find the number of administrative tasks associated with case management overwhelming and identify them as a top factor in attrition (Hagman & Casey, 2018). Efficient case management is a time consuming but critical factor in the development of high-quality IEPs. A special education teacher's caseload impacts the amount of time available for the administrative tasks associated with case management, including evaluating the learning needs of students, developing suggested written content for the IEP, providing specialized academic instruction per the student's IEP, and coordinating the IEP team to ensure that services are delivered as specified.

Determining the intensity of time and effort required to adequately case manage students is challenging. The number of students on a teacher's caseload is an imperfect measure of actual workload. For example, some special education teachers serve students with very intensive needs and supervise a large number of special education paraprofessionals. Although these teachers have fewer students on their caseload, their *workload* may be comparable to a teacher with more students but who have fewer intensive needs and/or fewer paraprofessionals supporting them. Lowering caseloads, limiting the range of settings in which each special educator works, and/or reducing the number of

paraprofessionals they are responsible to manage, are all variables that administrators can adjust to support teachers in effective case management (Suter & Giangreco, 2009). Caseload also matters to teachers. In a 2019 survey of nearly 1,500 special educators, respondents ranked smaller class sizes and caseloads along with adequate resources to meet IEP requirements and administrators who support the IEP process in the top three factors impacting their success as educators (Fowler, et. al., 2019).

In an inclusive environment – that is, one in which students with disabilities are served primarily in the general education classroom or wherein a teacher co-teaches with a general education teacher – workload and caseload are even less synonymous. Teachers in these settings may case-manage students with a variety of needs, supervise varying numbers of paraprofessionals, have additional duties related to the inclusive program, and/or work only part time with students with IEPs (Suter & Giangreco 2009). Solis, Vaughn, Swanson, and McCulley (2012), in a review of the efficacy of co-teaching models, found that overall, teachers reported a lack of adequate resources for inclusion – including inadequate access to personnel to support the model. At least one study suggested decreasing the student-to-staff ratio in co-teaching settings as an effective way to support inclusive practices.

Suter and Giangreco (2009), in a study of 19 schools in Vermont, found schools that identified more students as eligible for special education received more human resources. This finding suggests that schools staffing practices may tie the number of students identified for special education to the amount of resources a school receives even when a state's funding formula attempts to decouple those variables. This practice may incentivize the identification of students with disabilities and compromises the goal of providing a robust intervention system in general education. The authors suggest using total school enrollment (with appropriate demographic adjustments) to determine the number of special educator FTE in schools rather than use the total number of students with disabilities. The authors offered some initial numbers from which a study of a "special educator school density" model might begin. They found that schools that maintained a ratio below 1:80 special educator FTE to total enrollment reported they had, in general, the necessary human resources to do their work, could ensure quality service delivery, and were better able to address the natural fluctuations in student needs and special education enrollment.

Giangreco, Suter, and Hurley (2011) revisited the question of effective personnel utilization on a larger scale convenience sample in Vermont. They considered "special educator school density" - the number of special educators FTE per total school enrollment – and its impact on other self-reported variables. The study confirmed the findings of the 2009 study, including the finding that reduced identification rates of students with disabilities is correlated with fewer special educator FTEs – an unintended and possibly disincentivizing side effect of more robust early intervention systems. The authors were also able to establish special educator school density as a variable that can predict special educator ratings of their work responsibilities as conducive to providing effective special education services.

To add to the research base on teachers' perceptions of workload related to their caseloads, Fall and Billingsley (2011) used a national survey of special education teachers to explore the working conditions of early career special educators – including caseload and workload – in high and low poverty school districts. Findings of the survey indicated no significant difference in teacher's perception of workload manageability between the two groups, although teachers in high poverty districts were slightly more likely to agree to a great extent when asked whether routine duties and paperwork interfere with their teaching. Despite similarities in teacher's perceptions across high and low poverty districts the study

found that teachers in high poverty districts served four more students on their caseload on average than did those in low poverty districts. Teachers in high poverty districts also reported greater cultural and linguistic diversity in their caseloads.

Considering inequities in teacher retention and caseload across LEA demographics is important because low income and rural communities are especially affected by special education teacher shortages (CEEDAR, 2016). To increase the quantity of special education teachers in these areas, policy makers often apply short term strategies that reduce requirements for entry into teaching. Unfortunately, such policies may exacerbate the inequitable distribution of quality special education teachers, exposing high needs students to the least experienced teachers (Boe et al., 2013). Long-term solutions to quality special education staffing in hard-to-staff communities are needed. The primary solutions validated in the research literature are high quality teacher induction and mentoring, incentives, "grow your own" programs, and partnerships with institutions of higher education.

MSDE policies, procedures, and practices

Researchers reviewed MSDE policies and procedures related to the IEP process to identify opportunities to create efficiencies and reduce any extra burden created by requirements that go beyond the federal IDEA regulations. The Maryland regulations and procedures are strong in ensuring that materials for families are written or made available in accessible formats and languages and also written in plain language so that they are accessible to all. Maryland has a number of regulations that exceed IDEA requirements. Most of these do not, however, create unnecessary burdens interfere with parents and guardians accessing their rights under IDEA, the intent of these regulations that exceed IDEA requirements is to protect those rights. Exhibit 31 describes each of those requirements and the researchers' evaluation of the impact of the regulation on the IEP process.

Exhibit 31. COMAR and other State Requirements that Exceed IDEA Requirements

COMAR and other State Requirements that Exceed IDEA	Summary	Impact on IEP Process
COMAR 13A.03.02.09D(1)); (3)-(5) Graduation Requirements for Public High Schools	Defines GED graduation requirements and defines graduation requirements for students with IEPs who will receive a High School Certificate	
COMAR 13A.05.01.04A, COMAR 13A.05.01.05D, COMAR 13A.05.01.06A, COMAR 13A.05.01.06E(6), COMAR 13A.05.01.07B(1)(a), COMAR 13A.05.01.07D(3) - Child identification, Evaluation and Eligibility	Defines the evaluation and reevaluation process, provides the state specific timeline for initial evaluation and provides that parents receive an accessible copy of each report, draft IEP, data chart or other document the IEP team plans to discuss at least 5 business days prior to the scheduled meeting and	Ensures families receive evaluations in a timely manner and accessible documents in a timely manner prior to and after meetings.

COMAR and other State Requirements that Exceed IDEA	Summary	Impact on IEP Process
	an accessible copy of the IEP 5 business days after the meeting.	
COMAR 13A.05.01.09A(1), COMAR 13A.05.01.09F - Individualized Education Program (IEP)	Describes the IEP content requirements. Also requires that all MD public agencies adopt the Md Online IEP or a product that conforms to the form and format of the MD Online IEP as of July 1, 2008.	Objectives must be written for each IEP annual goal while IDEA require objectives only for students whose course of study is based on alternate achievement standards. (34 CFR §300.320(a)(2)(ii)
COMAR 13A.05.01.08B(2), COMAR 13A.05.01.11B - Extended School Year (ESY) Services	Requires Extended school year to be considered at least annually and defines criteria for considering. Adds Extended School Year to the Procedural Safeguards.	
COMAR 13A.05.01.10C(5), COMAR 13A.05.01.10C(6) - Least Restrictive Environment	Provides requirements for placement at home as part of the continuum of placement and also stipulates home may not be a placement for disciplinary actions.	Clarifies home as a placement option.
COMAR 13A.05.01.11C - Procedural Safeguards	Requires that parents be informed of the graduation requirements as part of the procedural safeguards and of student progress toward those requirements	
COMAR 13A.05.02.05D(12), COMAR 13A.05.02.12, COMAR 13A.05.02.13D, COMAR 13A.05.02.13H, COMAR 13A.05.02.13I, COMAR 13A.05.02.13N - Administration of Services for Students with Disabilities	Adds requirement that a representative of the State Parent Training and Information Center be a member of the state advisory committee; requires approval of schools for nonpublic placements; all districts must develop and submit a staffing plan; accessibility of technology based instructional products; requires local Special Education Citizens Advisory committees; allows for the reimbursement of licensing fees for certain professionals	

COMAR and other State Requirements that Exceed IDEA	Summary	Impact on IEP Process
Education Article §8-418, Annotated Code of Maryland	Education- Children with Disabilities – Habilitative Services Information Requires each local school system to provide to the parents of a child with a disability verbal and written information about access to habilitative services through health insurance, including a copy of the Maryland Insurance Administration's Parents' Guide to Habilitative Services at various times including annual IEP meeting.	Adds a requirement to annual IEP meetings to share this information annually.
Consent, Senate Bill 710	Senate Bill 710 exceeds the requirements of federal law. In addition to the actions for which the IDEA requires parental consent, Maryland law now requires that an IEP team must obtain the written consent of a parent if the team proposes to: 1) Instruct the child (who has been determined eligible for participation) using alternate standards that do not provide credits toward a Maryland High School Diploma; 2) Assess the child (who has been determined eligible for participation) with the alternate education assessments aligned with the States alternate standards; 3) Include restraint in the IEP to address the child's behavior as described in COMAR 13A.08.04.05; or 4) Include seclusion in the IEP to address the child's behavior as described in COMAR 13A.08.04.05. If the parent does not provide written consent to one of the actions listed, the IEP team must send the parent written notice of their consent rights no later than five (5) business days after the IEP team meeting informing them that: 1) the parent has the right to either consent to or refuse to consent to the action proposed; and 2) if the parent does not provide written consent or a written refusal within fifteen	Adds written consent requirements to IEP meetings for alternate achievement standard, alternate assessment, seclusion and restraint.

COMAR and other State Requirements that Exceed IDEA	Summary	Impact on IEP Process
	(15) business days of the IEP team meeting, the IEP team may implement the proposed action (Md. Code Ann., Educ. §8-405(f)(2)).	

LSS/PA policies, procedures, and practices

LSS/PA policies, procedures and practices for the IEP process align with the MSDE policies, procedures, and practices. Researchers did not observe any official requirements. The LSS/PAs participate in and receive technical assistance from MSDE which is aligned to the state Strategic Plan. LSS/PAs submit materials to MSDE that verify their policies, procedures, and practices align with state department requirements.

Researchers interviewed fourteen LSS/PA special education directors from ten LSS and four PAs to learn more about administrative challenges to efficient IEP and special education processes and strategies that Maryland LSS/PAs are implementing to address challenges and create efficiencies. Each 60- to 90-minute interview was conducted using a structured interview protocol, allowing for cross-interview question–response comparison. Interview protocol are provided in Appendix 7.

At the local level, researchers interviewed 14 directors of special education representing a subset of the total 24 county schools' systems and 4 other public agencies that serve students with disabilities. This subset included the 10 school systems visited, plus the four public agencies: Maryland School for the Deaf, Maryland School for the Blind, JSES schools, and the SEED School.

When asked what is working well in their LSS/PA's special education administration, LSS/PA directors reported the following:

- Many directors reported a strong increase in inclusive practices. Principals are starting to see the benefits of providing greater access and equity for all students. Conversations in IEP meetings and about students are evolving to look at services and supports, rather than programs and placements.
- Directors reported revisiting and refining their approaches to staffing plans including working with budget offices, human resources office, and even the family advocacy community to really look at staffing plans and ensure that they include feedback from and reflect the priorities of diverse stakeholders. One director said, "we have been able to clean up some antiquated processes, and change processes that have been conducted in isolation. We've been working diligently with others, so they understand the needs, even in the budget office. For example, we had the budget office go with me on some visits to school, so they can really see the students and the services, so they're not just looking at it from a fiscal perspective or a data point. So that way they've been really going in to see how this plays out at the school level. They've also been

going on some nonpublic visits with us too, so we can see that comparable services here within our county, so they can understand it and how our funds and our needs are really aligned then."

- LSS/PAs are replicating DEI/SES processes and using the indicators of quality inclusive practice to evaluate schools in their systems. One LSS/PA reported that schools that have higher performance on the three Strategic Plan outcomes have higher assessment scores.
- Multiple directors reported that the focus on secondary transition through the Strategic Plan and discretionary funding has led to more work-based learning, better access to career and technical education, and collaboration with the career and college readiness office.

When asked what could be done better and what resources are needed, LSS/PA directors identified the following needs:

- Providing more PLOs for general education teachers and school administrators around supporting all students to increase the quality of specially designed instruction for all students.
- The train the trainer model of professional development may not be having the planned impact. Some LSS/PA directors reported that technical assistance and guidance doesn't always get to the people who need it, or it is shared differently than it was initially presented.
- Specific training for the IEP chairperson was identified as a need by multiple LSS/PA directors. Many directors reported that it would be helpful if that person were qualified to review IEPs and make recommendations for improvements for individual student and across teachers and schools. DEI/SES reported that they are initiating new training from the state for IEP chairpersons that will help address this need.

In response to the question about needs and an additional question about the overall challenges of special education administration, the majority of responses were related to staffing. Directors reported challenges with recruiting and retaining personnel and especially qualified personnel for positions like school psychologist and speech language pathologist. Multiple LSS/PA directors reported that they have been able to increase retention rates by providing sufficient, high-quality training for professionals that is relevant to the need of those students who are served on their current caseloads.

Beyond recruitment and retention, LSS/PA administrators were equally or more concerned with how to manage staffing in changing environments — including when students are moving within or between LSS/PAs, and when increasing numbers of students are receiving services in inclusive settings. Staffing is a topic that must be revisited throughout the year as caseloads change. One director identified the specific challenge of the interaction between LSS/PA-level staffing and school-level administration. When administrators in schools are not efficiently using their allocated special education staff, it becomes an even greater challenge.

The information reported by LSS/PA directors is supported by the survey results from special education professionals. Special education and general education teachers reported personnel shortages and caseload as a barrier and strongly recommended reviewing policies for special education evaluations requested during breaks including the summer.

Teachers also recommended developing systems (e.g., provide an IEP clerk) to help reduce the paperwork, scheduling, and filing burden on special education teachers. Reviewing caseloads and service schedules to ensure special education teachers have time to complete the required paperwork and develop high-quality IEPs was also suggested.

Conclusions and recommendations

This section describes the researchers' conclusions and recommendations for modifying administrative goals and strategies to make the IEP process and special education services more efficient. Again, conclusions and recommendations are addressed at both the state and local system levels.

Conclusion 1.3.1 (State System): Maryland COMAR and MSDE DEI/SES procedures are compliant with IDEA. Some requirements go beyond the requirements of IDEA but do not unnecessarily increase the burden of or complicate the IEP process.

While some Maryland requirements go beyond IDEA, researchers did not see any evidence that they create additional burden for IEP teams, including families.

Recommendations

MSDE should continue to be transparent about the requirements that go beyond IDEA and provide ongoing technical assistance to the LSS/PAs on best practices for implementation of these policies and procedures to ensure that lack of understanding of the requirements does not create an unintended burden for families or other IEP team members.

Conclusion 1.3.2 (Local System): Professionals report inefficiencies and stress due to shortages of trained personnel, as well as high caseloads.

The greatest reported challenge to LSS/PA implementation of efficient IEP processes and special education services is the efficient recruitment, use, and retention of highly trained professionals. The lack of a system to efficiently manage caseloads even when there are sufficient personnel, is creating stress for the system and especially for teachers.

Recommendations

LSS/PAs should explore new ways to allocate human resources. Such approaches may include revisiting traditional staffing allocations that have been in place for many years, and the researchers recommend that the reviews be conducted across programs within an LSS/PA. One resource that may be helpful is the guidance on Layering Funds to Blend Services provided on page 25 of the Strategic Plan (MSDE, 2016). LSS/PA administrators should consider new ways of addressing priorities for all students that may create better efficiencies for special education and other professionals.

Special education teacher caseloads should be considered holistically – including the number of students and level of student need, the number of paraprofessionals supervised, the setting in which the special educator works, and the service delivery model (e.g., co-teaching). Research suggests that policy makers should err on the side of smaller caseloads, given their impact on the attrition rates of special education teachers, perceptions of teacher effectiveness, and some evidence that shows positive impacts on student achievement. Administrators may also consider the staffing of special education personnel in light of the overall student enrollment in a school rather than the number of students with disabilities to prevent adverse incentives to identify more students to receive more education specialists. Additionally, lower caseloads may decrease the demand for paraprofessionals, freeing up special educators' time to provide direct services and/or build the capacity of general education practitioners and systems to support the inclusion of students with disabilities.

Chapter 2. Special education funding in Maryland and the cost to establish adequacy of funding for students with disabilities

Introduction

Federal Funding for Students with Disabilities

States are obligated to meet, and help LEAs meet, the fiscal and programmatic requirements of the IDEA. IDEA guarantees all children with disabilities FAPE in the least restrictive environment (LRE). To support the FAPE requirement, the U.S. Department of Education provides IDEA grants to states and territories to pay a portion of the excess costs of providing special education and related services to children with disabilities required under IDEA (National Education Association, 2019). Federal funding for special education has remained relatively flat over the past 40 years. When Congress passed the first iteration of IDEA in 2974, it promised that the federal contribution would equal 40 percent of the national average per pupil expenditure. Since then Congress has only provided the equivalent of about 15 percent of the national average per pupil expenditure – just over a third of the initial promise. (FFY 2018 Budget Summary)

The number of students served in special education has increased from 6.4 million to 7.0 million students, or 13% to 14% of total public school enrollment between 2011–12 and 2017–18. (National Center for Education Statistics, 2019) Moreover, during the same period there has been a shift in the rates of identification in high cost eligibility categories, namely, autism (National Center for Education Statistics, 2019; Chambers, Perez, Socias, Shkolnik, Esra, 2004). Local education agencies are obligated to meet the FAPE and LRE requirements in IDEA irrespective of cost. Because cost legally cannot be a limiting factor in the education of a child with a disability, LEAs are required to pay for services such that a child can make appropriate progress and the cost of services cannot determine the extent to which they are or are not included in the IEP. The education of students with disabilities therefore can be very expensive - nearly twice the cost of a student without a disability on average (Chambers, Shkolnik, & Perez, 2002). To meet these costs special education spending has proportionally increased over time placing pressure on state and local budgets.

Maryland Funding for Students with Disabilities

Maryland provides funding to LSS/PAs for students with disabilities through a separate targeted formula. Funding for the targeted amount of special education is based on a single weight of .74 added to the base amount for each Maryland student. In FY20, Maryland's base funding amount is $7,244, so students with disabilities are targeted to receive $5,361 in additional funding. Each district's funding is based on the prior year's October 30 count of students with disabilities.

Maryland has an equalized funding system with a target of an even split between state and local responsibility for funding for each individual formula, including the special education formula. The state calculates this even split at a statewide level, based on the wealth of each district. This means that some districts receive the majority of special education funding from the state and others are expected to appropriate the majority of the funds needed to administer special education, although local funding of the local share amount is not required by state law. After the initial state and local split has been calculated for each district, the state applies a floor to the local special education expected

appropriations, to ensure that each district receives at least 40 percent of its special education funding from the state. Once the floor is applied, the state share and expected local appropriations are finalized. The full legislation for the description of the funding formula is at Md. Code Ann., Education § 5-209 (2018). Section 5-209(a)(5)(i) articulates that the number of students with disabilities and associated funding will not include Maryland School for the Blind, Maryland School for the Deaf, and JSES schools which is administered through MSDE.

Additional targeted funding for special education has been provided and forecasted based on the recommendations of the Kirwan Commission on Innovation and Excellence in Education. The Kirwan Commission is a multi-year initiative to research and develop major funding and policy reforms to improve the quality of Maryland's public education system. As a result of the Kirwan Commission, Senate Bill 1030: *The Blueprint for Maryland's Future* was enacted in 2019 to launch three-years of increased funding for PreK, special education, teacher pay, and other programs: $255 million in 2019-2020; $355 million in 2020-2021; and at least $370 million in 2021-2022 (Maryland General Assembly, 2019). It is anticipated that in its 2020 session, the Maryland Legislature will introduce additional changes including proposed revisions to special education funding.

Section 2.1. Assessment of how all LSS/PAs spend their special education funds and allocate their teaching and family support services staff

This section describes how Maryland LSS/PAs spend their special education funds and allocate their teaching and family support services staff through an overview of spending in Maryland and spending data for the LSS/PAs, followed by a profile for each of the four public agencies describing their funding structures, staffing plans, and budget processes.

Research questions:

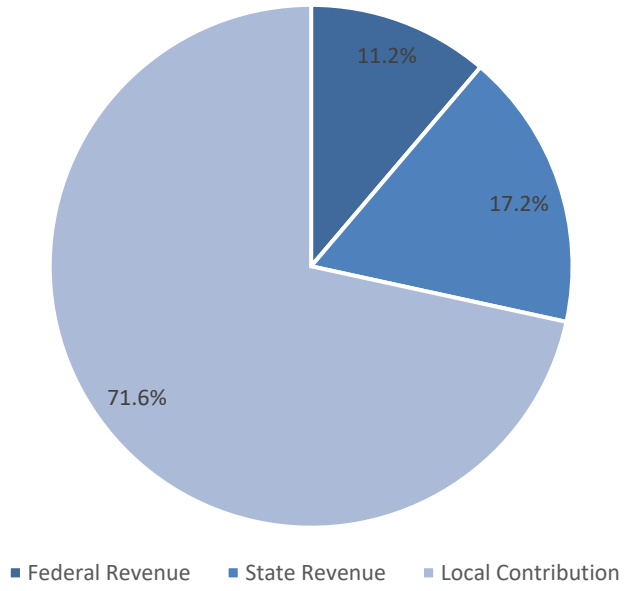
- What revenues (federal, state, and local) are dedicated to the education of students receiving special education in Maryland?
- Do these revenue patterns differ across the types of LSS/PAs? What types of spending do these revenues support?
- On what do LSS/PAs spend these resources? What proportions and amounts are dedicated to labor, non labor, and other spending? Do these patterns differ among LSS/PAs?
- What types of staff are employed to support students receiving special education? What are the caseloads? Do staffing and caseload patterns differ among LSS/PAs? How much time is it estimated that general education teachers spend supporting students receiving special education? Does this differ among LSS/PAs?

Overview of Spending and Staffing for Special Education in Maryland

Funding allocated to and by LSSs

In fiscal year 2018, Maryland spent a total of $1.780 billion toward special education, or $17,374 per special education student. Of this, $1.657 billion, or $16,169 per special education student, was revenue and local contributions for LSS/PAs. This included $185.9 million in federal revenue, or $1,814 per special education student; $284.9 million in state revenue, or $2,781 per special education student; and $1.186 billion in local contributions, or $11,575 per special education student. Exhibit 32 shows the percentage of each of these sources of revenue or local contribution.

Exhibit 32. State Revenue, Federal Revenue, and Local Contribution for Special Education, 2018



Source: MSDE, Annual Financial Report, FY 2014–2018.

Similar to other states, local contributions make up the majority of resources dedicated to special education. In Maryland, LSSs contributed 71.6% of the resources required to support the defined needs of students receiving special education in their school systems. This local contribution does subsume revenues that were allocated by the state to LSSs via other components of the state aid funding formula, for example, foundation grants. The researchers were unable to obtain this component's statewide proportion to local contributions, as the practice varies, but did review Maryland's IDEA Maintenance of Effort (MOE) Compliance Template & Certification for a small sample or LSSs for the 2017–18 state fiscal year. According to those reports, across the small sample of LSSs, other state funding sources supplied between 18% and 49% of the local contribution component.

Other state funding for special education

In addition to the formula funding for LSSs for students receiving special education, Maryland provides additional resources for the support of students with disabilities, including:

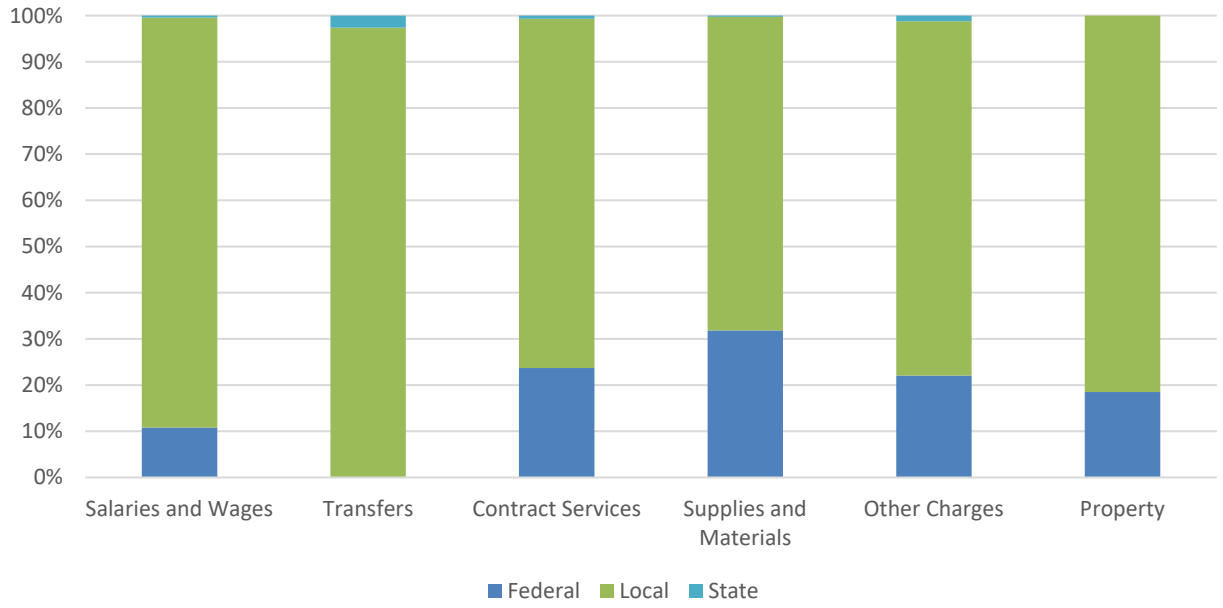
- $101.8 million for nonpublic school and agency placement: This allocation supports placements made by IEP teams into nonpublic schools or agencies that serve the unique needs of students with disabilities. This amount of money constitutes the state's contribution as part of the reimbursement program for the placement of these students per COMAR section 13a.05.02.14. This is not funding for students on IEPs who are parentally placed in private and parochial schools. Note that there is no federal funding for nonpublic placements. This amount of resources was not subject to investigation by the researchers per the original scope of the study.

- $21.7 million for the transportation of students receiving special education: This allocation is provided to LSSs to supplement the cost associated with transporting students whose IEPs require specialized transportation from their home to educational location, including a nonpublic school.

Spending data

Digging deeper into the revenue distribution patterns for LSSs, Exhibit 33 shows how federal and state revenue and local contributions are distributed across object codes for students receiving special education. For the purposes of this analysis, the researchers were unable to distinguish between expenditures of state revenue and of local contribution. This dynamic makes it difficult to understand the allocation choices and to calculate the actual amount of state support that was spent on special education and related sources. Interestingly, federal resources are used more substantially in categories such as contract services (23.7%), supplies and materials (31.8%), and other charges (22.1%) compared with their overall proportion of 11.8%. In these instances, they represent twice or almost three times as much relative to overall contributions.

Exhibit 33. Special Education Spending Object by Revenue Source, 2018

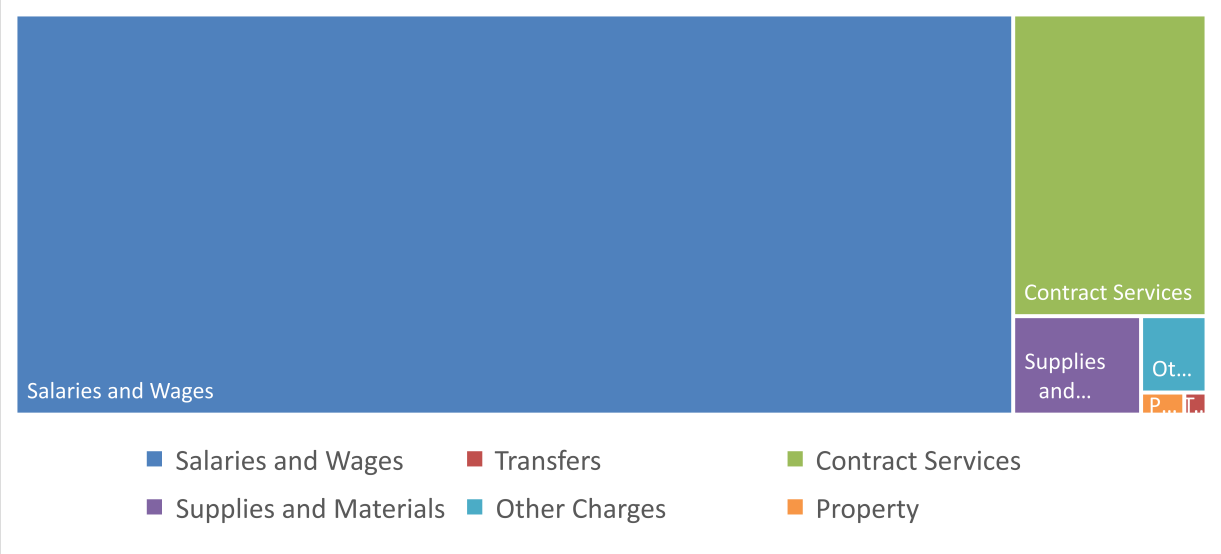


Source: MSDE Annual Financial Report, FY 2014–2018.

Exhibit 34 provides a breakdown of the proportion that each object code makes of the total spending on special education in LSSs. Compared with overall spending on public education in Maryland, in which 89% is composed of salaries and wages for instructional professionals, a large proportion of special education spending in Maryland, 77.4%, is dedicated to salaries and wages. Departing from typical spending patterns for overall spending in public education, there are sizeable resources that are

dedicated to transfers ($265.2 million, or 16.0% of the total) and contract services ($85.6 million, or 5.2% of the total). Within the transfer object code, the majority was dedicated to nonpublic agencies, comprising $232.0 million of the total $265.2 million. The remaining was dedicated to state schools and other special education placements. This observed spending pattern is not uncommon for spending within special education, as school districts will typically access other services either through transfers or contracted services to gain access to expertise that enables the school system to meet the needs of the students as outlined in their IEPs.

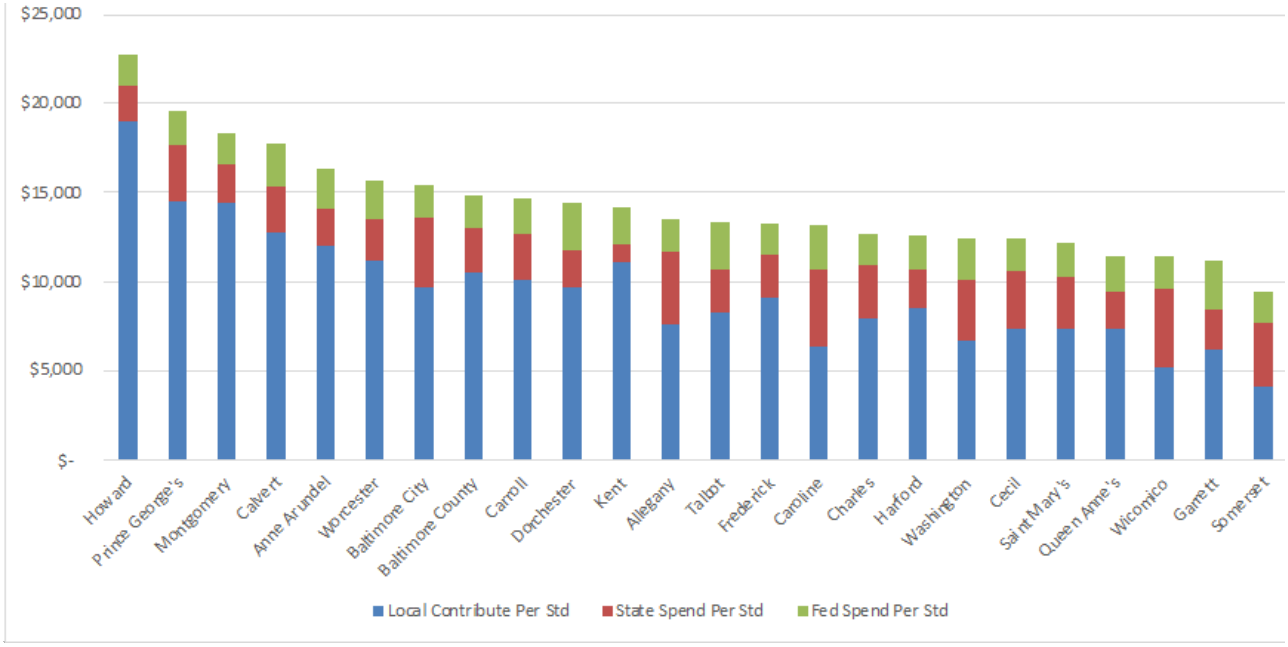
Exhibit 34. Special Education Spending by Object Code, Amount, and Proportion, 2018



Source: MSDE Annual Financial Report, FY 2014–2018.

Exhibit 35 shows the total revenues per student in special education by LSS. In fiscal year 2018, the statewide average revenue and contribution per student in special education was $16,169, with a range of $9,446 to $22,761. Much of the variation in spending can be attributed to the differences in local appropriations for special education. Federal revenue makes up about 12% of the statewide average special education spending, with an average of $1,911 per student in special education and a range of $1,715 to $2,753. State revenue makes up nearly 17% of funding and has a larger range than federal, with a low of $956 per student in special education and a high of $4,450. This leaves local revenue to provide nearly 72% of all special education funding. The lowest-revenue local district raises $4,112 per student in special education, whereas the highest-revenue district raises more than $19,000 per special education student. The statewide per-pupil average is $11,588. Spending per student in special education is highly correlated with each local district's per-pupil revenue, a correlation of nearly 1.0, where 1.0 is perfect correlation.

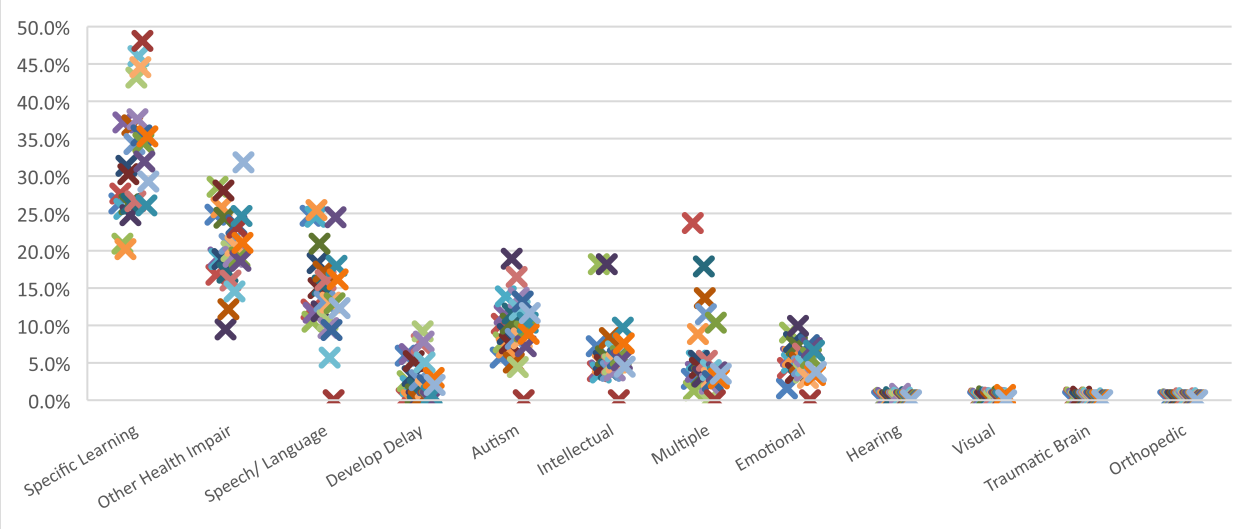
Exhibit 35. LSS Special Education Revenue by Source, Ranked by Highest to Lowest Revenue per Student, 2018



Source: MSDE Annual Financial Report, FY2014–2018. MSDE End-of-Year Attendance Files, SY2014–2018.

The LSS/PAs also serve students with a broad range of types of disabilities in their schools. Exhibit 36 provides a range, by type of student disability, of the proportion of the special education population served by the LSS/PA. As previously discussed, the largest proportions of most LSS/PAs serve students with specific learning disabilities, followed by students with other health impairments and speech/language disabilities. Further, some classifications of disability category display a much higher range than others. For example, the Specific Learning category of disabilities displays the largest range, from 20% to 47.5%, followed by Speech/Language and Multiple, each with a range of 25 percentage points. Not all categories of disabilities appear in every LSS/PA. Given this variation, it may be expected that as the complexity and proportion of need increases, the necessary revenue would also grow to match such a need. However, researchers found a weaker correlation (0.5145) between the amount of revenue per student in special education and the count of the categories of disability served by the district. A stronger correlation (0.8933) was found between the overall student membership of the LSS/PA and the count of the categories of disability served by the district. This stands to reason, as the overall size creates an opportunity to take advantage of economies of scale and offer support for students who require specialized treatment (e.g., deaf-blindness, orthopedic disabilities, a traumatic brain injury, etc.) that a smaller system would be unable to bear the cost to support.

Exhibit 36. Type of Disability as a Proportion of Total LSS/PA Special Education Population, Grades K–12, 2018



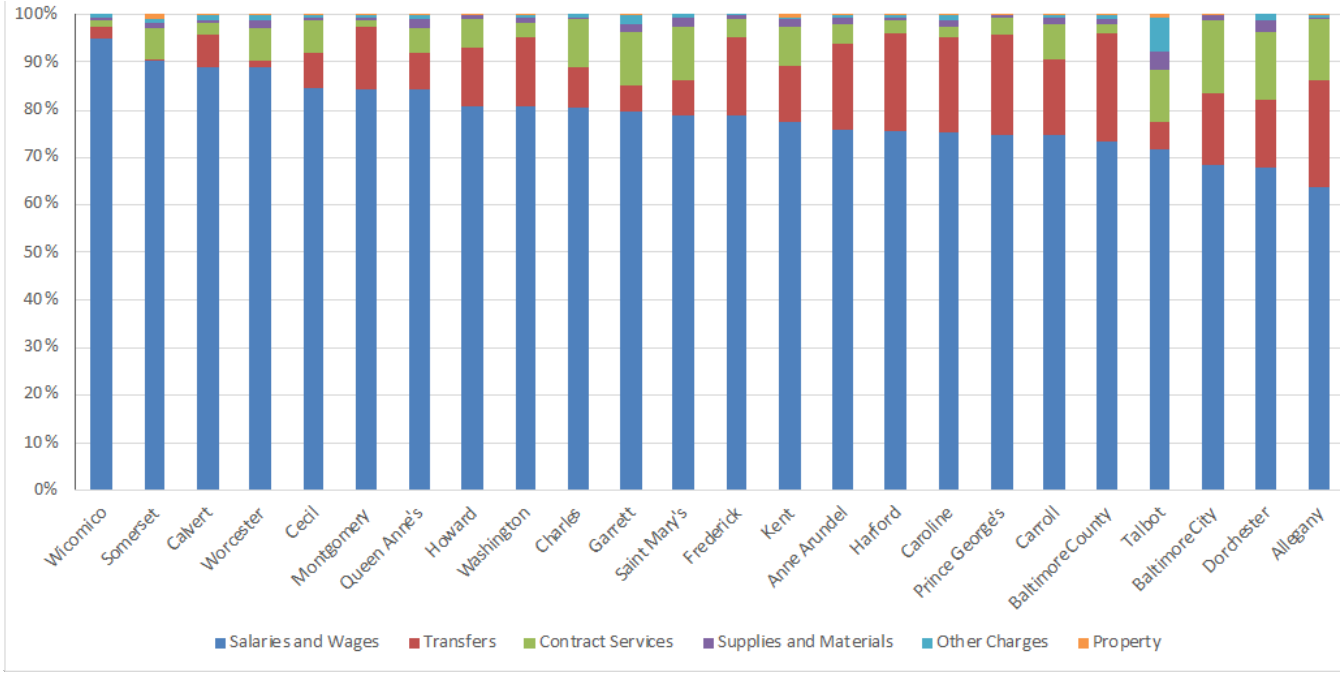
Source: MSDE, Maryland Online Individualized Education Program (MOIEP) Data. SY2015 through 2019; Baltimore County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Anne Arundel County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Howard County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Wicomico County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018

Such observable patterns suggest that the revenue provided for students with disabilities in Maryland is not aligned to the type of disability. This is explained above, in a discussion on the state's current funding formula for students with disabilities.

Maryland's LSSs use these revenues to provide services to students receiving special education through a number of specific resources. Exhibit 37 and supplemental tables in Appendix 2 show the expenditures per student with a disability for a number of expenditure areas. The majority of spending is on salaries and wages, at 77% of all expenditures. Transfers, which are mostly dollars for nonpublic placements, are the next-highest expenditure area at 16% of all special education expenditures, and contracted services account for 5%. In total, the three expenditure areas account for nearly 99% of all special education expenditures.

Though the three areas account for nearly all of statewide special education expenditures districts, they have very different percentages from one district to another. The highest percentage of salaries is 90%, and the lowest is 64%. One district spends 23% of total special education expenditures on transfers; the lowest percentage of transfers is just 1%. Similarly, the lowest percentage of contracted services is 1%, the highest is 15%. The differences in how districts utilize special education resources is likely related both to their ability to provide certain services within the district and to choices made on how to best serve students. It is also important to remember that each district has a different distribution of students receiving special education and a different amount of resources to utilize.

Exhibit 37. Special Education Spending per Student by School District and Object, 2018



Source: MSDE Annual Financial Report, FY2014–2018; MSDE End-of-Year Attendance Files, SY2014–2018.

Salaries and wages

Further investigation of the state's spending on salaries and wages for special education shows several emergent patterns of the type of staff that are employed to support students with disabilities. Exhibit 38 provides a breakdown of LSS/PAs' $1.28 billion in spending in this object category. Although the majority of resources are spent directly on the compensation of certified teachers (56.1%), other certified staff (20.5%), instructional aides and assistants (13.9%), and administrative, supervisory, and principal staff (6.9%), other spending occurred in both staff development and substitutes. However, staff development in total represents only 0.3% of the total spending on special education. Such low amounts of funding relative to the overall compensation spending for certified teachers may be one of the contributing factors to challenges in the retention of special education teachers. By comparison, overall spending for staff development as a proportion of total spending on salaries and wages in Maryland is 0.9%, or three times that of the investment for special education staff. Substitutes for these staff also constituted a small proportion — 2.3% of the total — with the majority made up of substitutes for certified teachers. This pattern may reflect a general practice in special education that if the teacher is absent from the special education classroom, then the instructional aide assigned to the classroom will oversee the class for that day.

Exhibit 38. Special Education Spending on Salaries and Wages Object Code, 2018

Object Code Category	Total Amount	Percentage (%)
Salaries & Wages	-	-
Certified Teachers (instruction)	$720,214,586	56.1%
Other Certified Staff (instruction support services)	$263,260,642	20.5%
Administrative & Supervisory	$76,513,313	6.0%
Principal	$11,552,411	0.9%
Instructional Aides & Assistants	$178,646,208	13.9%
Staff Development	-	-
Staff Development for Certified Teachers	$1,748,793	0.1%
Staff Development for Other Certified Staff	$704,212	0.1%
Staff Development for Instr. Aides & Assistants	$46,855	0.0%
Staff Development for Substitutes	$643,599	0.1%
Substitutes	-	-
For Certified Teachers	$28,555,282	2.2%
For Admin & Supervisory	$185,233	0.0%
For Principals	$903,991	0.1%
GRAND TOTAL	**$1,282,975,123**	**100%**

Source: MSDE, Annual Financial Report, FY 2014–2018.

The "Conclusions and Recommendations" section of this report provides additional detail and information about the variation in these spending patterns, presented at the state level here. Further, those patterns are analyzed alongside other information, such as the composition of the special education population as well as the educational environments in which they are included.

Exhibit 39 shows 2018 staff data by LSS/PA for the types of staff who often fulfill these roles: guidance counselor, nurse, psychologist, and social worker.

Exhibit 39. Students per FTE by LSS/PA for School Psychologists, School Social Workers, Nurse/Hygienist/Health Professionals, and Guidance Counselors, 2017–18

Students per FTE , by LSS	School Psychologist	School Social Worker14	Nurse/Hygienist/ Health15	Guidance Counselor
Allegany	1,157	8,102	0	312
Anne Arundel	1,207	2,944	0	368
Baltimore City	537	399	0	924
Baltimore County	1,278	1,499	627	369
Calvert	1,245	3,088	603	368
Caroline	1,820	0	559	321
Carroll	1,434	24,945	635	280
Cecil	2,090	0	472	293
Charles	799	0	0	340
Dorchester	749	1,497	0	299
Frederick	1,517	1,639	0	288
Garrett	1,214	0	344	304
Harford	1,051	3,678	593	369
Howard	779	0	820	347
Kent	1,831	0	0	458
Montgomery	1,418	7,793	0	323

[14] Those LSS/PAs with zeros (0) likely use some other type of resource support to provide school social workers that were not captured in the annual financial report data analyzed by the researchers. This distinction has been verified through interviews with program and fiscal staff in various LSS/PAs with zeros (0) listed in this table.
[15] Ibid for nurse/hygienist/health-based staff.

Students per FTE , by LSS	School Psychologist	School Social Worker14	Nurse/Hygienist/ Health15	Guidance Counselor
Prince George's	1,345	15,888	623	347
Queen Anne's	1,978	0	537	376
Saint Mary's	1550	0	487	381
The SEED School	0	0	181	0
Somerset	1374	2747	338	343
Talbot	2216	1108	0	295
Washington	2179	1147	0	404
Wicomico	1583	1017	548	219
Worcester	1587	0	394	302

Source: MSDE Staff Salary Files, SY2014–2018; Note: Position categories are based on those included in the 2017–18 Maryland Staff Reporting System Specifications and Procedures Manual, and the relevant number is included in the table.

In the analysis of the staffing plans, the researchers identified a range of ratios for speech language pathologists to IEP students, from 1:40 to 1:60. It was impossible to tell how many school psychologists were providing services in special education. Psychologists generally play a critical role in both general and special education. In general education, they have the expertise to help set up and maintain multi-tiered systems of support, as described above, as well as to play a strong role in problem-solving and pre-referral interventions. In special education, they are responsible for leading the evaluation and re-evaluation of students' eligibility for special education, as well as for completing functional behavioral assessments and establishing positive behavioral support plans and other behavioral intervention plans, including those that outline the use of conditional procedures (such as seclusion and restraint).

The use of Board-certified behavioral analysts (BCBAs) in Maryland schools seems to be emerging, which is positive. In other areas of the country, use of BCBAs has been established for more than a decade. Evidence of LSS/PAs including BCBAs in their special education staffing was found in only eight LSS/PAs, and the numbers of FTEs are small. Baltimore County reported the highest number, with six FTEs. Frederick reported four FTE BCBAs and clarified that these are employed to support all students with behavioral challenges, not just those who receive special education. (This is considered a best practice.) Harford and Prince George's County each reported two FTE BCBAs, with Prince George's County using Medicaid dollars to pay for its BCBAs. In Calvert County, the staffing plan contained a note that their SECAC recommended additional FTE BCBAs and a school psychologist, although none were noted in the actual plan.

Regarding the use of paraprofessionals, the researchers saw a common practice and also read about it in staffing plans: the practice of hiring part-time, temporary paraprofessionals to do the difficult work of

providing individualized support to students with the most intensive needs. This approach can decrease the effectiveness of services and unnecessarily stress both the system and the child. The number of FTEs of special education paraprofessionals ranges from zero in JSES schools to 1,381 in Montgomery County.

Profile: Maryland School for the Blind

Maryland School for the Blind, a statewide resource center, is one of the public agencies designated by the state to serve a small population of students that have severe visual impairments. The school has a rich and deep history in the state dating back to 1853 when it was first established as the Maryland Institution for the Education of the Blind (MSB, 2019). The single school campus is located just northeast of Baltimore in the suburban town of Nottingham, Maryland. It serves approximately 207 students, from infancy through 21 years old (MSB, 2019). Of those students who attend school regularly, 79% are classified as having multiple disabilities, and the balance are classified as having a visual impairment. All students are referred by their residential LSS/PA, evaluated, and assessed by the admissions team as having near or complete blindness. Approximately 44% of the students are residential (92 students), and the other 56% are nonresidential. Residential students stay overnight during the week and return home on the weekends. As stated in the school's annual financial statements for the fiscal year 2017 and 2018, "[T]he School serves more than 846 students each year throughout the state in their homes, schools, and communities through special, time-limited programs provided on campus." Nonresidential students are on campus during school hours. In aggregate, Maryland School for the Blind serves approximately 1,053 students per year. The school offers four primary, on-campus services:

- General academic program for students who are on a diploma track;
- Functional academic program for students who need significantly modified instructional standards;
- Specialized program for students who have multiple disabilities plus blindness; and
- Specialized program for students who have autism and blindness.

For the purposes of this study, the researchers looked at preschool and school-aged services. However, there are also itinerant services and services on campus for infants and toddlers, too.

Funding Structure

Maryland School for the Blind is one of the public agencies that is largely funded directly by the General Assembly of Maryland. According to the school's Annual Financial Statement for Fiscal Year 2018 and 2017, the state provisioned 85% of all the school's revenues in fiscal year 2018 (MSB, 2019). There are numerous sources of revenue that support this school. However, the four primary contributors include the main grant, an enhanced services grant, federal fund allocations, and in-state tuition from LSSs. Exhibit 40 provides details on these revenue sources and the Maryland education code associated with such allocations.

Exhibit 40. Revenue Sources for the School for the Blind, Fiscal Year 2018

Revenue and Other Support	FY 2018 Total ($)	FY 2018 per Student ($)	Relevant Sections of Maryland Education Code (if applicable)
State appropriation	$23,018,459	$21,860	Main grant based on §8-317 of the Annotated Code of MD
Sponsored projects	$1,135,005	$1,078	Most IDEA funds (Title 34 §300.705 (b) Code of Federal Regulations)
Enhanced services	$4,636,151	[16]	Supplemental grant on §8-315 of the Annotated Code of MD
Tuition (in-state)	$1,285,311	$1,221	LSS contribute §8-310, §8-415 of the Annotated Code of MD
Extended school year	$533,310	$506	Independent fundraising by the school
Private gifts	$1,105,471	$1,049	Includes a temporarily restricted gift of $465,590
Direct outreach service	$678,935	$645	N/A
IRC book reimburse	$122,056	$116	N/A
Other income	$88,445	$84	Includes a temporarily restricted amount of $19,999
Net assets released	$0	$0	$802,811 transfer from temporarily restricted to unrestricted

The largest proportion of funds for this school is from the main grant that provided $23.02 million in support, or approximately $21,860 per student. This main grant is a line-item appropriation from the General Assembly. The main grant is calculated using a three-year rolling average of enrollment in the school. The next-largest amount is the enhanced services grant, which in fiscal year 2018 provided $4.6 million in support, or approximately $4,403 per student provided under Code of Maryland (COMAR) 8-310.1, which is made up of funds from MSDE as well as the child's resident county. These enhanced services provide funding support above and beyond the main grant to meet the needs of students requiring one-on-one support. The third largest source of funds is in-state tuition from LSSs, which supplied $1.29 million to support state institutions in fiscal year 2018, or approximately $1,221 per student. The formula that generates the in-state tuition from the LSSs is memorialized in Maryland statute.

[16] The enhanced services are a per-student grant and allocation that does not benefit all students. Therefore, a per-student figure was not included for this line item.

Exhibit 41 presents the expenditure categories for the school. In total for the fiscal year 2018, the school spent $33.04 million, or $31,379 per student. Although this amount is high compared with the average special education spending by LSS/PAs in the state, it reflects the set of resources to support this student population.

Exhibit 41. Expenditure Categories for the School for the Blind, Fiscal Year 2018

Program and Supporting Services	FY 2018 Total ($)	FY 2018 per Student ($)	Relevant Sections of Maryland Education Code (if applicable)
Program Services	-	-	-
Education	$14,453,400	$13,726	Primary delivery of instruction and instruction support
Residential	$3,893,171	$3,697	Spending for housing of students throughout the school year
Educational support	$4,154,611	$3,946	Support for students such as occupational therapy, etc.
Outreach	$1,356,352	$1,288	
Nutrition	$786,159	$747	
Resource services	$657,564	$624	
Supporting Services	-	-	-
General administration	$3,721,066	$3,534	Educational administration and principals
Physical facilities	$3,549,298	$3,371	
Fundraising	$470,651	$447	

Staffing

As might be anticipated, such levels of funding result in much lower staffing-to-student ratios. In many cases, students require one-on-one staffing for severe medical and/or behavioral needs. Students are also provided with assistive technology when appropriate, such as a computer, a tablet, or other personal device. Exhibit 42 provides a breakdown of the 162 full-time equivalents employed at this school by their position type and program.

Exhibit 42. Staffing for the School for the Blind, Fiscal Year 2018, FTEs

Staff Type	Early Childhood	Multi-disability Blind	Autism Blind	Functional and General Academic	Physical Education	Other
Principal/Assistant Principal	1	1	1	3	-	-
Teacher	7	8	7	26	2	-
Instructional Aide/Assistant	11	19	17	31	2	-
Orientation/Mobility Specialist	-	-	-	-	-	11
Music, Career Education, Library	-	-	-	-	-	10

The other primary driver of the higher spending per student compared with other LSS/PA spending on students with disabilities is that the school's expenditures include $3.55 million, or $3,371 per student, on physical facilities.

Budget Process

Decision-making for budgeting and allocation of staff is different from that of traditional school districts because of its unique purpose and funding structure as a state agency and a residential school. The budget is for the entire "school," which includes not only the on-campus education program, but also the residential program, the extensive range of student services, early learning, and statewide outreach services. The six school directors (of Academics, Finance, Security, Outreach, Residential, and Related Services), with input from the four principals, determine the budget, staffing, and allocation of resources, with final approval by the superintendent. Staff and resources are allocated to the education program based on the needs of students as outlined in their IEPs.

Profile: Maryland School for the Deaf

Maryland School for the Deaf, a statewide resource center, is one of the public agencies designated by the state to serve a small population of students that have severe hearing impairments. The school's discussion of their mission and activities in their 2018–19 staffing plan states, "We believe that our mission of providing a linguistically, culturally, and academically rich environment is achieved as the school and community actively combine their efforts to respond to the ever-changing needs of our students and our increasingly complex society." The school, which was established in 1868 (MSD, 2019),

has two campus locations. The first campus is located just southwest of Baltimore in the suburban town of Columbia; the second is located farther west, in Frederick. The school serves approximately 511 students across both campuses, all of whom have IEPs. Of these students, 49% have deafness as a primary disability, another 35% have multiple disabilities, and the remaining 15% are hearing impaired. Approximately 25% of the students are residential (128 students), and the other 75% are nonresidential across both campuses. Residential students stay overnight during the week and return home on the weekends. Nonresidential students are on campus during school hours. The school offers primary academic programming from elementary through high school. These programs support students in making progress toward a regular high school diploma or certificate of completion. For the purposes of this study, we looked at services for preschool and K–12 students. However, there are also services on campus for infants and toddlers.

There is a strong deaf culture operating in this school; and within deaf culture, students who are deaf are not thought of as having a disability. Rather, they are thought of as needing a different language from spoken English in order to learn. This philosophy sets this school apart from other LSS/PAs. For these students, the alternative language (i.e., not English) is the visual language American Sign Language (ASL). Students who are deaf and who also have other disabilities are thought of as "deaf-plus." This impacts special education budgeting in that not all leaders and staff believe that deaf education is equivalent to special education.

Funding Structure

Maryland School for the Deaf, as a state-operated program, is one of the public agencies that is largely funded directly by the General Assembly of Maryland and is funded like a state agency. The Maryland Department of Management and Budget recommends an appropriation based on constraints of the entire state budget. The funding is provided based on the legislated funding formula for state residential schools, which in turn is based on a per-pupil amount calculated from a four-year average. Capital funds are available, when requested by the school, for projects around campus. According to the school's 2018–19 staffing plan, the state provisioned $31.5 million for the school in a state line item appropriation. The school also receives federal IDEA Part B and Medicaid funds.

There are funds for "enhanced services" that the MSDE and the sending counties provide, under COMAR 8-310.1. These funds are largely for one-to-one paraprofessionals to support students whose needs go beyond available staffing and are directed toward specific students. The rates are set by the MSDE based on education costs in each county. The number of students requiring enhanced services, and thereby generating enhanced services funds, has been rising steadily since the inception of the funding source, with a total of three across the two campuses in 1998–1999 to a total of 49 in 2017–2018. When this funding is generated to cover enhanced services at Maryland School for the Deaf, the funds are a reflection of each student's resident/sending county's rates.

Staffing

Like all LSS/PAs, Maryland School for the Deaf completes a rigorous staff planning process, based on student performance objectives developed through a self-study of 2010 and standards shared through the accreditation process for schools for the deaf. The staff planning process is rich with stakeholder

input. Exhibits 43 and 44 present the staffing patterns at the Frederick campus from the 2017–2018 staffing plan, as an example.

Exhibit 43. Frederick Campus Staffing Patterns of Service Providers of Special Education Services and Related Services, Including Paraprofessionals, 2017–2018

Frederick Campus	Teachers	Teacher Aides	Class Size: Range	Class Size: Avg.	Administrative Support
Elementary (Ages 5–12) Students = 97	15 FT 1 FT Art 1 FT ASL	4 FT 8 FT ES 3 PT	4–12	6.5	1 each of Interim Assistant Principal, Clerical Aide, Reading Specialist, and Behavioral Support Specialist
Middle School (Ages 11–15) Students = 56	9 FT	3 FT ES	3–12	7.5	1 Interim Assistant Principal
High School — Academics (Ages 14–21) Students = 135	17 FT	1 FT AEP 12 FT ES 1 PT ES	2–12	7	1 each of Assistant Principal, Clerical Aide Behavior Support Specialist, and Program Coordinator
Career Tech Education (Ages 11–21) Students = 193	9 FT	1 FT 3 FT ES	3–14	8.5	One each of Assistant Principal, Clerical Aide, and ILS Specialist
Physical Education (Ages 5–21) Students = 327	3 FT	2 FT 1 PT	4–22	13	One each of Athletic Director, Assistant Director, Athletic Operational Coordinator, Program Coordinator, Team Leader (11 months), and Trainer
Totals	55 FT	34 FT 5 PT	-	-	Sum of the total staff named above

Exhibit 44. Frederick Campus Staffing Patterns of Related Service Providers for Special Education, 2017–2018

Related Service Staff — Frederick Campus	Full Time	Part Time	Hourly	Number of Students Served (Caseload)
ASL Teacher	3	-	-	Entire school population, other students as determined by IEPs
Audiological Services	1	1	-	All students as determined by IEPs
Behavior Support	3	-	-	Entire school population (one for each department)
Occupational Therapy	1	-	-	Determined by IEPs, direct student services and consultative services for classroom staff
Physical Therapy	-	1	-	Determined by IEPs, direct student services and consultative services for classroom staff
Mental Health Counseling	3	-	-	25+ students as determined by IEPs; other students as needed 1.5 counselors in high school and 1 in middle school
Psychiatric Counseling	-	-	1	Works with students and staff as needed
School Psychologist	1	-	-	Entire school population, other students as determined by IEPs
Reading Specialists	1	-	-	Works with Elementary students as determined by IEPs
Speech Services	4	1	-	Determined by IEPs, direct student services and consultative services for classroom staff
Transition (HS)	3	-	-	Entire population ages 14–21
Program of Enhanced Services Supplemental Aides	23	3	-	26 students as determined by IEPs
Employment Specialists	4	-	-	18–21 students
Guidance Counselor	1	-	-	High school students only
Social Worker	1	-	-	Entire school population, other students as determined by IEPs

Most of the school staff speak ASL. For the purposes of evaluating students for continued eligibility, some of the testing must be done in ASL, which means that qualified staff are even more difficult to find. When school leaders were interviewed about related services personnel, for example, it was learned that the school has one school psychologist for 300 students and another for more than 100 students. Both speak ASL. One is deaf, so ASL is the individual's primary language. The other has a deaf education background. The school has one BCBA shared for both campuses. The BCBA is also the director of Maryland School for the Deaf's Enhanced Services.

Budget Process

In May, the school submits a budget figure to the Maryland Department of Budget and Management (DBM) for the school year that will start a year from then. As specified in Maryland School for the Deaf's 2017—2018 staffing plan, the budget figure is determined by a minimum funding formula that is based on a weighted four-year average enrollment. There is a mechanism for requesting additional funds. In July, the DBM provides an estimate of revenue, and the school develops a budget proposal that it submits to the DBM formally in September. In January, the proposal is finally recommended to the governor and the General Assembly.

The school leaders (Orioles Leadership Team, or OLT) meet to discuss needs and to kick off the budgeting process. The OLT consists of the superintendent, personnel director, chief operating officer, campus principals, dean of Student Affairs for the Frederick Campus, and special assistant to the superintendent. The superintendent, principals, CFO, and human resources staff make decisions (not the special education director). In the education program, they have the ability to move "PINS" from a teacher aide to a teacher to the different campuses, to a different department. They get an allotment of salaries. They do this a year behind: They look at what happened this year and plan for the next year.

Profile: The SEED School

As of October 1, 2018, there were 60 students receiving special education at the SEED School. Most have a specific learning disability (45%), other health impairment (27%), or an emotional/behavioral disorder (10%).

Located on the western edge of Baltimore city, the SEED School is a boarding school for middle and high school students from across the state who are at risk due to poverty, single-parent homes, and/or incarcerated parents. Students access the school via a lottery system. The SEED School has experienced significant administrative turnover, with new leadership practically every year. However, staff that have filled leadership positions have come into those roles with significant experience and longevity with the SEED School and its programs. Researchers noted that the atmosphere in the school is warm and the teachers all know the students. This is a college prep school, and the students are given support to choose appropriate colleges given their disabilities, and SEED School staff continue to follow them through college.

There is not a student intervention team process or a multi-tiered system of support, or MTSS, in place. From interviews and focus groups conducted at the SEED School, the researchers learned that arrangements for substitute teachers to cover for classroom teachers so that they can attend IEP

meetings are often overridden. Special education leaders and staff shared concerns that there is not a clear understanding of special education across the school leaders and teachers and that students' needs and accommodations, as documented in their IEPs, are sometimes disregarded. For example, students who require extra time on tests have been penalized for taking too long by having points taken away for missing the next class. The school is not meeting targets for math and English language arts proficiency for students with disabilities.

Funding Structure

The SEED School has approximately a $17 million annual budget, but this figure includes both the residential portion and the education portion. There are about 400 students, with approximately 10% identified as needing an IEP. The school receives a per-pupil allocation based on the amount that the MSDE calculates for each resident (sending) school district. There are 14 staff people in special education, representing a combination of teachers and paraprofessionals. At times, requests for needed additional staffing are denied because of insufficient resources and competing priorities.

The school receives about $60,000 per year in federal pass-through (special education) dollars, along with about $35,000 in discretionary funds to improve secondary transition and access, equity, and progress. Title I is paying for three paraprofessionals this year. Medicaid billing generates about $75,000 each year, but half of this amount must be returned to the state. The SEED School does not receive family support services funds from the MSDE. But it does receive other discretionary dollars. Funds targeted to secondary transition planning and access, equity, and progress have enabled the school to provide college tours and internships for students who are on IEPs and have helped increase instructional capacity of the school's staff.

The funding formula for the Seed School, as a Maryland public boarding school, mandates that the school will receive funding equal to 85% of whatever that jurisdiction spent on per-pupil education. In 2008, the Maryland legislature passed a bill for the boarding portion, which is a line item mandating that the school will be notified of grant awards from the MSDE. But ultimately it comes down to where the students are from (cost per student times 85%).

As a residential school that draws from the entire state, the SEED School receives no local funds. But $500,000 to cover special education comes from the general fund, and the school generates $600,000 to $700,000 per year through fundraising. However, those funds are not specifically for special education.

Staffing Structure

The SEED School has some unique staffing and budgeting challenges due to its size, funding structure, and at-risk student population. For example, it is difficult to fill related services positions because the school does not have a need for full-time coverage. To address the needs, it has started subcontracting related service providers from nearby school systems instead of using an agency and has started holding teacher recruitment fairs and using agencies to recruit special education teachers.

Budget Process

The special education budget is developed as part of the school's entire budgeting process. Each department submits a budget. One CFO said, "Special education gets the same consideration as anyone else." The process looks at the biggest gaps between current funding and current needs and attempts to fill that gap. Special education is a subset of the academic budget. The special education director first takes her budget needs to the school's director of Academics to make a case for the need. The CFO and principals believe the school is able to meet the needs of the students who receive special education. The head of the school has the final say on all budgets, but the CFO also plays a major role. If cuts need to be made, they are not made to FTEs. Rather, they are made to summer trips, college trips, and so on. And then fundraising ensues to try to cover those items.

The SEED School's CFO noted two unique challenges related to the DEI/SES funding and general supervision activities. Initially, one of the discretionary grants came midyear without advanced warning, making it difficult to plan comprehensively for how to allocate spending. Also, special education fiscal monitoring, and especially the documentation of LEA maintenance of effort (LEA MOE), isn't differentiated for residential schools. Since accounting records are not kept in a way that aligns easily with requirements for documenting LEA MOE, this presents a challenge for the SEED School to demonstrate compliance.

Profile: Juvenile Services Education System Schools

The Juvenile Services Education System operates 13 schools in juvenile service facilities across the state. The system is operated out of the MSDE. The Maryland Department of Juvenile Services historically operated its own schools, but the General Assembly passed a law in 2004 transferring the responsibility to the MSDE. It took nine years for the entire transfer to be finalized in 2013. The facilities have a broad range of purposes and sizes. Students are placed in juvenile services facilities by court order. Across all 13 facilities, approximately 5,000 students receive educational programming annually.

For this study, researchers visited Backbone Mountain Youth Center, a boy's facility in rural Garrett County, and Thomas JS Waxter Children's Center, a detention facility for girls in Laurel. As of October 1, 2018, there were a total of 134 students with disabilities, ages 6–21, receiving special education in JSES schools and 67 students with disabilities, ages 6–21, receiving special education in adult correctional facilities.

On January 4, 2019, Professor Peter Leone, University of Maryland, College Park, published an article in the *Baltimore Sun* that highlighted strengths and challenges of the state's current approach to educating incarcerated youth. The researchers noted some of the same strengths and challenges during their visits to two JSES schools. Some are outside the scope of this study. But two relevant concerns were unanimously shared by staff interviewed at Waxter Children's Center: (1) the inadequate space for classrooms and school administration and (2) the difficulties of procuring educational materials (for testing and instruction) in a timely manner caused by state-level procedures that are inefficient.

Students experience school within the larger community of each facility. The capacities of each of these facilities are small, ranging from J. DeWeese Carter Youth Center with a capacity to serve 14 students to Baltimore City Juvenile Justice Center with a capacity to serve 120 students. The median capacity is 42.

Each of these facilities has a primary mission. Seven are "detention" facilities. Six are "placement" facilities. A detention facility provides a secure facility to detain a young person when he or she is involved with the courts and the young person is determined to be a risk to herself/himself or others. Maryland law requires juvenile courts to detain youths in the least restrictive setting possible; therefore, many are detained at home in the custody of their parents or placed on community supervision. A placement facility is where children and youths are housed, educated, and cared for when they have been committed to the Department of Juvenile Services (DJS) for corrections or treatment or both. The DJS has a goal of only using incarceration when necessary for public safety.

Although education is the right of each young person placed in these facilities, it is not the primary goal. Consequently, the school experience is overshadowed by the primary goals of the facility, typically, safety and security. One example is how students are grouped together for security purposes, which are often dictated by the constructs of the residential programming, rather than academic abilities and needs. Students with and without IEPs are typically placed together, with limited options available for pullout services.

Funding

The Juvenile Services Education System is administered by the MSDE, in collaboration with the state's juvenile services agency. Like LSS/PAs, JSES schools receive special education pass-through funding from the DEI/SES. JSES schools submit a count of students receiving special education in its facilities. The DEI/SES provides discretionary grant funds for family support services, secondary transition, and access, equity, and progress and provides the large pass-through grant, $200,000 to $220,000. JSES schools also receive federal funds in the amount of $800,000 for neglected and delinquent youth. This is quite a bit more than the IDEA pass-through funds.

Each JSES school has a principal, classroom teachers, and special education teachers. Residential advisors or correctional officers are also present during the school day and can be found in classrooms. They should not be mistaken for paraprofessionals. Since their purpose is safety and security, it is not typical to see them interacting with students around academics.

In JSES schools, the schedule is year-round, and there are very few days off for teachers — only the major holidays. This schedule does not deter job applicants in rural areas because the pay is based on the scale paid in larger metropolitan areas. But the JSES schools in and near the urban and suburban communities where teachers are paid relatively well cannot compete with the LSSs for teachers. Also contributing to special educator frustration in JSES schools is that they are pulled off the job to substitute if a general educator is absent. In addition, they are not notified until they walk into work that day.

Staffing Structure

The overall budget comes from the legislature through an appropriation. If additional funds are needed, the agency can make an "over the target request" for inclusion in the governor's proposed budget. The total student population has been going down each year — over the past five years, it has decreased

from about 5,000 to about 4,200 — so such a request has not been made since 2015. In the past, requests have been made for additional "PINS" (approval and funding for full-time certified staff).

The proposed budget for operating the JSES schools is based primarily on spending from the prior year. JSES school leaders look at the needs of the special education population and determine how to allocate spending on professional development and testing materials. The schools do not receive their own discretionary dollars. The funds are allocated by the headquarters based on the needs of the school. For example, at Backbone Mountain, long-term placement for boys is receiving some of the grant funds to put some secondary transition services in place, including career exploration, a new vocational program under development, and visits to and enrollment in classes at the local community college. The school staffing plan is based on size/capacity of the facility, which translates to number of students possible on any given day. JSES school officials provided researchers with documentation on the provision of federal funds for the following services totaling $209,617 in fiscal year 2019:

- $100,250 for contracted services
- $102,225 for supplies and materials, including a reading inventory, a transition-planning inventory, a test of academic achievement, and psychological testing protocols
- $7,142 for transfers (indirect costs)

Exhibit 45 breaks down the JSES contracted services. These are small consultant contracts that are available, up to the hours listed, when needed for individual students.

Exhibit 45. Breakdown of JSES Schools' Contracted Services

Speech Services	Counseling Services	Psychology Services	Physical or Occupational Therapy	Tutoring Services	Vision or Hearing Services
250 hours	350 hours	200 hours	25 hours	300 hours	25 hours
$95/hour	$95/hour	$95/hour	$95/hour	$95/hour	$95/hour
$23,750	$33,250	$19,000	$2,375	$19,500	$2,375

Conclusions and recommendations

Conclusion 2.1.1: LSS spending on students with disabilities is more closely related to the wealth of the LSS and local revenue than to need of the students.

The statewide per-pupil average is $11,588. Spending per student in special education is highly correlated with each local district's per-pupil revenue, a correlation of nearly 1.0, where 1.0 is perfect

correlation. The provision of services to a student with a disability in terms of resource allocation may be more dependent on their geographic location than on their needs.

Recommendation

As reported in Section 2.5 and Appendix 3 the researchers found that the distribution of resources mechanism is not aligned to student needs. The researchers propose a model that would more accurately direct dollars based on students' disabilities and their established needs

Conclusion 2.1.2: There is a mild correlation between the size of the LSS and the amount of expenditures for contracted services or out-of-LSS transfers.

Small LSSs appear to be spending disproportionately more money for specialized services due to the lack of an economy of scale for services for low-incidence disability categories. Researchers further address this consideration with a recommendation to establish a high-cost pool or regional services, in Section 2.2.

Conclusion 2.1.3: The structures of the PAs prevent appropriate comparison to the other LSSs and application of the same recommendations.

Given both the unique revenue streams for and funding structures of each public agency, the direct comparison between LSSs and public agencies is not appropriate. However, the resource needs for public agencies appear to need a similar increase as LSSs given the similarly low educational progress for students with disabilities. Researchers took this variable into consideration when developing the recommendations in Section 2.5 for increased funding to both LSSs and PAs.

Conclusion 2.1.4: Given current financial reporting requirements, it is not possible to separate the total state investment in special education from the local investment.

Recommendation

Maryland should make transparent the level of state special education resource investment in Maryland schools and LSSs to increase understanding about how state funding is helping to offset inequities in local contributions to school systems. In order to do this, the state could take steps such as the following:

- Modify its annual financial reporting to include a mechanism for LSSs to clearly report the amount of local and state revenues used for special education expenditures.
- Enable an online side-by-side comparison feature that can show explicitly how state funds are helping to offset the lack of revenue-raising capacity in low-wealth communities.

Section 2.2. State policy scan of weights, including single and multiple weights, weights based on individual categories and clusters of disability category, and weight based on severity of student disability

Introduction and research questions

This section of the report examines how other states provide funding for students with disabilities. The researchers examine the various ways states fund special education, including within their base allocation, through a formula, or through a categorical or reimbursement model. Information in this section provides context for both the examination of performance and funding approaches (see Appendix C) and the researchers' final recommendations. The researchers' policy scan was focused on addressing the following research questions:

- How do other states fund special education?
- Do other states use single funding weights, multiple funding weights, weights that are based on individual or clusters of disability categories, weights based on severity of students' disabilities or needs, or a combination thereof?

Literature review

The application for an annual grant of federal funds under IDEA requires states to meet certain eligibility requirements, including a requirement that states continue to make available at least the same amount of state financial support from one year to the next for the education of children with disabilities (34 CFR §300.163(a)). The state maintenance of financial support (MFS) requirement is intended to protect the state contribution toward the education of children with disabilities from year to year. A large percentage of funds made available by the state are ultimately distributed to LEAs for the purpose of providing FAPE to students with disabilities through services outlined in their IEPs. Although states are required to maintain their financial support from year to year, they do have flexibility in how funds are made available to meet the requirement.

Each state has a mechanism for calculating and distributing state funds for special education. Although every state is different, there are two common approaches: (1) incorporate special education funds into the state's foundation, or base, funding for the broader education system or (2) develop a separate or categorical funding stream for special education.

In a *foundation* approach, the state determines an amount of money that LEAs need in order to provide education to all students. States can incorporate special education into the foundation funding so that the total amount an LEA receives includes state support for students receiving special education and related services under IDEA, but the funds are not a separate allocation.

In a *separate* approach, the state makes funds for special education available to LEAs as a separate funding stream. The funds may be a categorical add-on to the foundation amount or a separate fund entirely. These additional funds for special education are allocated through several different funding mechanisms, including formulas using a single weight/dollar amount and multiple weights/dollar amounts; a resource allocation model; categoricals; reimbursement; and a hybrid approach combining characteristics of different mechanisms. Each of these allocation mechanisms requires a count of students. How amounts are calculated varies: based upon actual counts of students with disabilities; a U.S. census–based approach that assumes a set percentage of students with disabilities; or a hybrid approach to counting students. A detailed review of the special education funding mechanisms used in each state is included in Appendix 5: State by State Special Education Funding Formula and Weightings Summary, and conclusions from the review are included in this section.

Specific formulas used to determine the amount of foundation funds and separate funds can be complicated, and adjustments after implementation of the formulas can reduce or raise the final amount of state support. One common adjustment is called "local share." As described above for Maryland, the local share requirement means that LSSs provide a certain amount of local funds toward total funding and the state covers the remaining amount. The amount that an LSS or LEA contributes varies by state and may be determined by local property values, income, or other factors. Local funds might come directly from the LEA through its tax revenue; in some cases, all LEAs submit their local revenues to the state (i.e., state levy), which then are redistributed back to LSSs based on district wealth or other characteristics. There also may not be an explicit local share requirement within the redistribution model.

Methods

For the national policy scan, researchers reviewed special education funding policies in each state by first examining available policy data collected nationally, including resources from the Education Commission of the States (2019), EdBuild (2019), and Dr. Deborah Verstegen (2018). Researchers then reviewed policy summaries from each state department of education or state legislature as well as statutory language. For each state, researchers identified how students are counted, which funding mechanism is used, and if a supplemental funding pool for high-cost students was made available.

State special education funding mechanisms

Examining other states' special education funding programs provided an understanding of the differences in how each state approaches special education funding while working to meet shared IDEA requirements. The researchers carefully examined the funding policies of all 50 states to understand:

- **How students with disabilities were counted**, including whether actual special education student counts, actual U.S. Census counts of all students, or average counts of students were

used and whether the state disaggregated students for funding purposes into different categories based upon disability, need, or service level.

- **Which funding allocation mechanism was used**, including whether special education funding was provided to local systems within the state's foundation/base funding allocation, through an additional formula or categorical approach, through a reimbursement model, or through some type of hybrid approach. For states that use a supplemental funding formula, the researchers further identified the specifics of the formula (single or multiple weights/dollar amounts or a resource allocation model).

- **If a supplemental high-cost funding pool was also made available**. In addition to each state's general approach to funding special education, states may also provide additional funding to local systems to help offset the costs for exceptionally costly programs for students with disabilities.

From the review of documentation from and about all 50 states, the researchers identified the following common special education funding mechanisms:

- **Within foundation:** Resources for special education are provided as part of the foundation funding for each LEA using an assumed percentage of students with disabilities (U.S. Census–based approach).

- **Formula/categorial** (divided into four sub-mechanisms):

    - **Single weight/dollar amount:** Funding is provided by a single weight or dollar amount applied to all students with disabilities, regardless of disability or need.

    - **Multiple weights/dollar amounts:** Funding is provided through either multiple weights or dollar amounts based upon student disability or need level.

    - **Resource allocation model:** Specific staffing and nonpersonnel resources are allocated based upon the number of students with disabilities.

    - **Categorical:** Designated funding for students with disabilities that is fully funded by the state. Distribution of these dollars varies by a given state's mechanism and can vary based on availability of funds.

- **Reimbursement:** Funding is based upon reimbursing LEAs for prior-year special education expenditures, typically at amounts up to a set percentage (actual student counts).

- **Hybrid:** Funding is provided using a combination of the above approaches.

It is important to note that state policies are subject to interpretation and could be classified in different ways by different reviewers. The research team reviewed all available national sources and made its own interpretation based upon this review and past experience. Another consideration when reading this section and the detailed information in Appendix 5 is that the researchers reported weights and dollar figures as the *additional* amount above base funding. For example, Maryland currently provides a

weight of 0.74 for special education above base funding. The researchers would report this weight as 0.74, whereas a different source may label this weight as 1.74, including the 1.0 base amount allocation.

Exhibit 46 summarizes the different approaches states take to fund special education in terms of how they count students and their general funding mechanism and is followed by further details on the states using different counts and funding mechanisms.

Exhibit 46. States by Count and Allocation Mechanism for Special Education Funding (2018–19)

Count	Within Foundation	Formula with Single weight/ dollar amount	Formula with Multiple weights/ dollar amounts	Formula/Categorial -- Resource Allocation Model	Categorical	Reimbursement	Hybrid
Actual	(0)	LA, MD, MO, NC, NH, NY, OR, WA (8)	AZ, GA, IA, IN, KY, MA, ME, OH, OK, SC, TX (11)	DE, NM, TN, VA (4)	CO, HI, PA, UT (4)	KS, MI, MN, NE, WI, WY (6)	FL, MS, NV (3)
Census	AR, CT, RI, WV (4)	ND (1)	NJ (1)	AL, ID, IL (3)	CA, MT (2)	(0)	(0)
Hybrid	(0)	(0)	AK, SD (2)	(0)	(0)	(0)	VT (1)

Within Foundation

Four states (Arkansas, Connecticut, Rhode Island, and West Virginia) provide special education resources as part of their foundation, or base, funding; this mechanism relies on using a U.S. Census–based approach that assumes that a certain percentage of students within that base will need special education services each year. Each of these states also provides supplemental funding for high-cost programs. High-cost funding pools are addressed in detail below.

Formula

Single student weight or dollar amount

Nine states use a single weight or dollar amount to fund special education. Under this method, LEAs receive the same amount of supplemental funding for each student in special education, regardless of the actual cost or resources required to serve the student. The specific supplemental weight or dollar amount based on special education status varies widely between states. Maryland uses this method with a single supplemental weight of 0.74; New York uses a weight of 1.41. Alternatively, New

Hampshire provides a supplemental dollar amount of about $2,000 per student with a disability, and North Carolina provides just over $4,000 per student with a disability.

Multiple student weights or dollar amounts

Rather than providing a single weight for all students in special education, 14 states provide multiple student weights, based on defined levels of student need or placement in specific disability categories. For states that provide resources by disability category, approaches range from providing a specific differentiated weight for each of the 13 disability categories defined in IDEA, like in South Carolina and Virginia, to collapsing specific disability categories into a smaller set of combined disability categories. For example, Ohio bases its weights on student disability, but has collapsed the 13 IDEA categories into six categories. Kentucky has different weights for three categories of students with disabilities, based upon incidence levels (low, 2.35; moderate, 1.17; and high, 0.24).

Resource allocation model

Seven states, including Alabama and Delaware, primarily use a resource allocation model to fund students with disabilities. Under such a model, states distribute resources (e.g., for FTEs for teachers, paraprofessionals/teacher aides, specialists, technology items) instead of dollars, based on the number of students identified as students with disabilities. These can be based strictly on student counts or counts can be weighted, as in the formula mechanism. For example, in Delaware, staffing allocations are based upon three student category tiers (basic, intensive, and complex) determined by the level of service required in each student's IEP.

Categorical

Six states provide funding for special education as a fully state-funded, designated categorical amount. Distribution of these dollars varies by a given state's mechanism and can vary based on availability of funds. For example, Utah uses a block grant distribution funding mechanism under which the amount allocated is based on averages of the prior five years, with a growth factor.

Reimbursement

Six states use cost reimbursement methods to provide funds to local agencies for special education. The states generally define eligible cost categories and the percentage of costs that will be reimbursed by the state. Wyoming is the only state that reimburses 100 percent of the cost of educating students with disabilities, though it recently capped reimbursement at the amounts provided in 2018–19. The other states, such as Kansas, Michigan, and Minnesota, that reimburse costs do so only up to certain percentages or dollar amounts, which are set in advance and communicated to local systems.

Hybrid

Finally, four states use a hybrid approach that combines elements of the different mechanisms noted above. For example, Florida uses a hybrid approach that provides differentiated funding to five categories of students with disabilities using a "matrix of service" that determines the overall nature and intensity of service needed; students in levels 1–3 are funded through a categorical approach, and students in levels 4 and 5 are funded through weights.

Supplemental funding for high-cost programs

In addition to the general special education funding approach for each state summarized above, 26 states provide supplemental funding for high-cost programs for students with disabilities. For example, New Jersey reimburses districts for students with disabilities whose costs exceed $40,000 in a public school placement or $55,000 in a private school placement. Louisiana provides additional high-cost funding for students with disabilities whose cost to educate exceeds a threshold of three times the average per-student expenditure. In Connecticut and West Virginia, specific state special education funding is exclusively for very high-cost programs, with the remainder of resources assumed to be addressed in the base funding allocation. Appendix 5 provides detailed information on high-cost funds for all 50 states.

Conclusions and recommendations

Conclusion 2.2.1: Most states use actual counts of students to allocate special education dollars.

Most states (36) fund special education based upon actual counts of students with disabilities, though five states (Nevada, North Carolina, Oregon, Utah, and Washington) cap the funding for students with disabilities counts at a certain rate. Twelve states use multiple categories based upon actual student counts in specific disability categories (such as Arizona, Oklahoma, and South Carolina) or tiered need/service level (such as Iowa, Kentucky, and New Mexico).

Of the remaining states, 11 use a U.S. Census approach instead, meaning a set identification rate of special education is assumed statewide. For example, Alabama funds special education at an assumed rate of 5% of a district's average daily membership. Alaska, South Dakota, and Vermont use a hybrid approach to counting students. In Alaska, funding is provided for two categories of students with disabilities — non-intensive and intensive — which are counted differently (U.S. Census count and actual count, respectively). South Dakota uses an assumed percentage of students in its mild disabilities category (census), then actual student counts in other categories. Vermont uses a U.S. Census approach for its primary resource model allocation, then also has a supplementary reimbursement amount based upon actual student counts/expenditures to ensure a 60/40 state-local split.

Recommendation

Given the large number of states using actual counts, the lack of any evidence of harm from using child counts, and the results from the cost functions study described in this report, Maryland can continue to use an actual count of students with disabilities in its formula for allocating special education funds.

Conclusion 2.2.2: There are a variety of methods for differentiating the allocation of funds for special education.

Most states differentiate funding based on either disability, disability category, or student need. A study of state weights clearly shows that differentiating resources results in improved outcomes for students with disabilities.

Recommendation

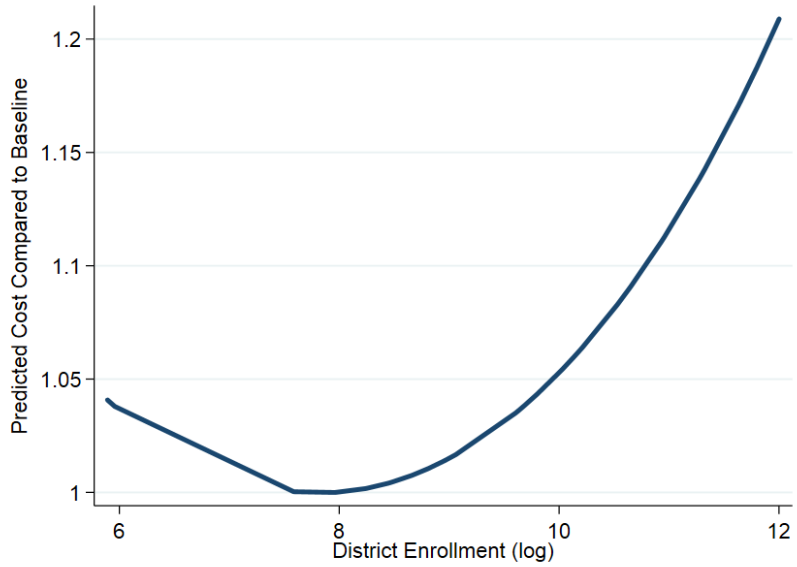
As described in detail in the conclusions and recommendations following sections 2.4 and 2.5, Maryland should differentiate the allocation of resources for special education. Mechanisms and data-based justifications for differentiation of resources are explored further in the cost function analysis in Section 2.5.

Conclusion 2.2.3: Maryland currently does not have a high-cost pool to offset exceptionally costly needs-driven programming for students with disabilities. Policymakers should consider the benefits of offsetting exceptional costs through a high-cost pool.

Although Maryland does have a mechanism for providing additional resources to serve students with disabilities who cannot be served in a public placement, it does not have any other mechanism to assist with exceptionally costly programming within an LSS. Most states have a mechanism for providing supplemental resources to local systems to fund high-cost programs, and many define high cost as a factor of the average cost for a student with a disability, such as five times or three times the average amount.

An observed trend in economic literature is that as organizations produce more units, their marginal costs (i.e., the cost of producing each unit) tend to go down, except at a very large scale of production (Silvestre, 1987; Canback, 1998). This is often described by a concept known as “economies of scale,” which refers to the notion that as an organization grows in size, it is able to produce more efficiently, and thus its marginal costs to produce each additional unit tend to decline. The exception occurs when production gets to an extremely large scale. At this point, due to the inherent cost of managing the scale of operation, marginal costs increase again (referred to as “diseconomies of scale”). Previous research has confirmed that diseconomies of scale occur within very large public school districts (Robertson, 2007). The results of the cost function analysis suggest that this concept applies to public school district operations, as does previous research (Augenblick, Myers, & Silverstein, 2001; Andrews, Duncombe, & Yinger, 2002). As the number of students goes up, the cost to produce the same academic growth goes down, except in very large LSSs, where the marginal costs begin to creep up again. This conclusion is illustrated in Exhibit 47.

Exhibit 47. Cost to achieve equivalent outcomes as district enrollment increases



Source: Authors' calculations based on cost function model analysis

The researchers do not suggest a specific policy direction for the state about the organization and appropriate size of LSSs. Rather, it indicates that in Maryland, the relationship between the scale of LSS operations and per-pupil cost is consistent with previous research findings and should be considered as a factor when funding LSSs to deliver educational services for students. For example, the state could align its funding allocations for LSSs — both small and large — to ensure challenges related to economies of scale are offset by the funding allocations. Alternatively, the state could support LSSs to achieve economies of scale by developing shared services within regions. Existing practices in parts of the state in areas to share contracts for transportation or specialized related services could serve as models for increased cost sharing.

As reported in Section 2.1, researchers found an inverse correlation between the size of an LSS and the amount of money transferred to support nonpublic placements in Maryland. This finding indicates that smaller LSSs are more likely to lack sufficient resources to meet the needs of some students in a public placement. They may also lack the economy of scale to provide specialized services that may be available in larger LSSs.

Recommendation

Maryland should explore the creation of a high-cost pool to offset expenses for exceptionally costly programming (including defining "high cost"). This approach may help to offset exceptional costs, especially for smaller LSSs. Given the large variability in size, by enrollment, of LSSs in Maryland, policymakers should also consider potential opportunities for smaller LSSs to pool costs for costly services or programs with other LSS/PAs in their geographic regions. Some states have created economies of scale by establishing regional service centers.

Section 2.3. International policy scan of effective funding and resource allocation decisions for students with disabilities

Introduction and research questions

This section of the report examines how other countries provide funding for students with disabilities. The researchers examined the framework within which various countries provide resources for students with disabilities. The researchers' policy scan was focused on addressing this question:

- How do other countries fund and support special education, including across the spectrum of students' disabilities and severity of needs?

Methods

For the international policy scan, the researchers reviewed the available information from the set of countries identified by the Center for International Education Benchmarking at the National Center on Education and the Economy (NCEE) as high performing: Canada, Estonia, Finland, Hong Kong, Japan, Netherlands, New Zealand, Shanghai-China, Singapore, South Korea, and Taiwan. The researchers reviewed the information collected by the NCEE for each country; additional sources that collected cross-country information about education funding and special education, including the European Agency for Special Needs and Inclusive Education, Organization for Economic Cooperation and Development (OECD), and World Bank; and each country's national education agency. For each country, the researchers first attempted to understand the country's general policies for educating students with disabilities and then attempted to understand its specific approach to funding students with disabilities, including funding sources, distribution methods, and funding mechanisms.

Underlying differences in special education practice between the United States and other countries

As the researchers reviewed the available information about special education funding in other countries, it became clear that there are differences in how these countries identify and provide services to students with disabilities that must be considered.

There is wide variation in how students are identified as having disabilities across countries

The United States, on average, identifies about 13% of students as students with disabilities, while identification rates for the other countries examined ranged from 4% to 38%. Largely, this difference is because each country has different definitions of what special education means and which disability groups would be considered eligible for special education or other specialized services. For example, in Finland, where 38% of students are considered to have special needs, the term is used very broadly to mean any student that needs additional educational supports at some point, whereas other countries with rates much lower than the United States only identify students with significant physical or intellectual disabilities and not students with learning disabilities or speech delays.

There are significantly different requirements for supporting students with disabilities across countries

Requirements for educating students with disabilities are federally mandated in the United States through IDEA and further defined in each student's IEP. It is important to recognize that many other countries do not have similar requirements to IDEA, and some countries may not set *any* service requirements at the national level. Canada is one such country. It does not have national requirements for special education; instead, requirements are separately set by each province. In other countries, expectations are different from the United States in terms of inclusion, the use of an IEP equivalent, special education being free and appropriate, and the age range for which educational services are provided. For example, in many countries, the push to include students with disabilities in mainstream settings has been underway only for the past 10 to 20 years, so many students still are not only served in separate classrooms, but also in separate special schools.

Other available resources for students and families significantly augment the design of support for students with disabilities

Finally, it cannot be overlooked that many of these countries have national health care systems or provide other wraparound supports for students with disabilities and their families that reduce the burden on the education system. Another consideration is that since special education is not necessarily fully funded in other countries, some costs may fall to families.

Each of these differences impacts the cost of providing services to students with disabilities and therefore makes comparisons between other countries and the United States challenging. As such, the researchers focused on the general approaches for funding special education in order to identify a number of illustrative examples of the differences in funding approaches in three key areas:

- Who pays for special education?
- How is that funding distributed?
- What is the specific mechanism for allocating funding?

Who pays for special education?

In the United States, funding for special education is split between federal, state, and local sources that also provide the funding for the broader public education system. This is not necessarily the case in other countries and is likely related to the individual governance structure of each country and each country's system, or lack of system, for providing comprehensive public education. In Hong Kong, Shanghai-China, and Singapore, special education is funded nationally. In Finland, funding for special education is split between the national and local level. Local authorities pay about 58% of the cost of basic education. Students with disabilities are also provided additional supports and services either through the LEA or, separate from the public education system, through their local municipality. In Canada, the majority of support and services available for students with disabilities are provided by provincial and territorial governments. Special education funding varies throughout Germany, with funding provided at the national, Lander (state equivalent), or local district level at different rates.

How is funding for special education distributed?

How funding is distributed by national and local sources also varies. For countries that do not fully manage special education at the national level, most LEAs are responsible for allocating funds. The Netherlands is an example of a country that has differed from this typical distribution method, and the country's approach has evolved significantly over the past two decades. In 2003, the country implemented a "backpack" funding model whereby funding followed students in special education to the school of their choice; then in 2014, the Netherlands shifted its funding approach again to instead provide funding through 152 regional alliances of mainstream and special schools. This latest shift for the Netherlands reflects the reality that economies of scale in service delivery for a segment of the student-aged populations crosses international boundaries and is an important factor when considering how best to distribute resources to maximize their impact on students.

What is the specific mechanism for allocating funding?

The researchers found that funding allocation mechanisms in other countries are similar to those used in the United States, including providing specific staff resource allocations, specific dollar amounts, or weighted funding. In Hong Kong, schools are provided with teachers and special education coordinators based upon their student population. In Estonia, the Ministry of Education provides a subsidy for each student that has special education needs based upon the student's specific characteristics and needs; this subsidy does not financially distinguish between students with disabilities in mainstream inclusion settings and students in separate settings. In Ontario, Canada, special education funding is allocated using a three-tiered funding model based upon levels of student need. In British Columbia, Canada, funding to provide support for students with learning disabilities, mild intellectual disabilities, and moderate behavior needs is included as part of the basic education allocation, with supplemental funding provided for students with more severe disabilities. Singapore uses weighted funding, assigning a weight of 1.5 times its base student funding level for students in special education who are in inclusion settings and a weight of 3.0 for students who have significant physical or mental disabilities for placement in special schools.

Conclusions and recommendations

Given how special education practice, funding sources, and other available resources for students with disabilities differ between the United States and other countries, the researchers did not reach any conclusions that are pertinent to the research questions and therefore do not make any recommendations for Maryland based on the international special education policy scan. It should be noted that it does appear to be common practice in other countries to differentiate support based on student need, which supports many of the report's recommendations presented in Sections 2.4 through 2.6.

Section 2.4. State weights study

Introduction and research questions

In this section, the researchers report on the analysis of the association between three state funding policies and student achievement gains in literacy, numeracy, and seven measures of social-emotional skills. The focus is on three aspects of state funding: the distribution of revenue for special education programs on the actual count of students with disabilities, different mechanisms for the distribution of revenue for special education (e.g., single or multiple weights categories, etc.), and the amount of revenue per pupil for students with disabilities.

These features were chosen because they vary sufficiently across states, can reasonably be expected to impact student achievement, and are easy to alter from a policy and regulatory standpoint.

Researchers focused on these questions:

- Do states with higher levels of funding for students with particular disabilities see higher levels of literacy, numeracy, and social-emotional development in students who have those disabilities?
- Do states that differentiate funding by disability category see higher levels of literacy, numeracy, and social-emotional development in students with disabilities?
- Do states that provide funding based on the actual count of students with disabilities see higher levels of literacy, numeracy, and social-emotional development in students with disabilities?

The outcomes of interest are limited to literacy, numeracy, and seven dimensions of social-emotional development: self-control, task persistence, approaches to learning, working independently, interpersonal skills, externalizing problem behaviors, and internalizing problem behaviors. These measures were chosen because they represent diverse aspects of child development, are commonly used in social science research, and were gathered repeatedly in the 2011 Early Childhood Longitudinal Study of Kindergarten (ECLS-K 2011) data (as described below). Data availability also drove the decision to focus on elementary school development, as the ECLS-K 2011 data do not include students in middle and high schools.

From the state policy scan presented in Section 2.2, the researchers know that states differentiate levels of funding provided for students with disabilities based on multiple factors, including disability category, severity of need, and setting in which services are provided.

The state weights study required a national dataset for the comparison of educational progress and functional outcomes for students. Although the ECLS-K does provide data by disability category for children in the study, it does not provide information on other measures of severity of need; on the types, amounts, and intensities of services provided to students with disabilities; or on the settings in which students received special education services. As reported in Section 2.5, the researchers did

consider these items in the exploratory factor analysis based on Maryland data despite the inability to study the effect across states.

The scope of this study is necessarily limited and does not represent the full range of special education finance or outcomes that may be of interest to policymakers. Most saliently, the researchers do not analyze how finance policies alter the quality of either the special education teachers or the pedagogical environment in which students with disabilities spend their time. Though such issues may be highly relevant, the challenges of testing multiple hypotheses with a modest sample size forced us to restrict our analysis to the following specific questions.

- Do states with more generous funding for particular disability categories see higher levels of literacy, numeracy, and social-emotional development in students who have those disabilities?

Higher per-pupil revenues for students with disabilities should translate into better and more tailored learning environments, which should consequently enhance student development. The researchers assess the relationship between per-pupil revenue for each of the 13 disability categories and the relative progress of students within those categories on standardized tests of literacy and numeracy, as well as on seven measures of social-emotional development.

- Do states that differentiate funding by disability category see higher levels of literacy, numeracy, and social-emotional development in students with those disabilities?

It is widely recognized that different disability categories may require distinct educational interventions and that these distinctions come with different costs. A single amount of revenue for each child, regardless of disability, is unlikely to adequately meet the needs of children who have disabilities that are more costly to address. Consequently, the researchers assess the relationship between differentiation and the relative progress of students with disabilities on standardized tests of literacy and numeracy, as well as seven measures of social-emotional development.

- Do states that provide funding based on the actual count of students with disabilities see higher levels of literacy, numeracy, and social-emotional development in students with disabilities?

In an effort to stem “over-identification”, whereby students are misidentified as having a disability by districts seeking to maximize revenue, many states provide a fixed amount of funding for students with disabilities rather than revenue based on the actual count of students with disabilities. These fixed amounts are based on some model of predicted need, but variance between the predictions and the actual number of students with disabilities may result in underfunded districts and lower performance for those students. The researchers assessed the association between providing funding based on actual counts of students with disabilities and the relative progress of students with disabilities on standardized tests of literacy and numeracy, as well as seven measures of social-emotional development.

Literature review

Policymakers and researchers are interested in the impact of special education funding models on practitioner behavior and learning outcomes for students with disabilities. Funding models that incentivize or disincentivize certain behavior at the practitioner level can be leveraged to help states impact practice and, theoretically, student outcomes.

Sigafoos, Moore, Brown, Green, O'Reilly, and Lancioni (2010) conducted a review of studies that investigated the impact of special education funding models. In the review, they considered four primary challenges related to investigating the impact of funding models: (1) the ambiguity in special education identification — eligibility categories are not always clear, nor are they consistently applied; (2) the impact of external factors on rates of identification — for example, teacher quality or socioeconomic status; (3) the ambiguity in terms relevant to the funding models — for example, how to define the term *discretionary* and consistently apply it; and (4) the challenge of establishing causation — studies provided useful information on perceptions of funding reforms rather than causal analysis. The authors concluded that none of the funding models identified in the review had a consistent impact on the cost of special education, the number of students identified for services, or the educational achievement of students. The authors suggest that a purely U.S. Census–based model may, in fact, be the best option, as it is relatively simple and mitigates adverse incentives.

Census-based models are thought by some to reduce incentives to over-identify students as students with disabilities generally or with a specific disability, because funding rates are not impacted by the number of students with disabilities or the type of students with disabilities enrolled in an LEA. Weighted models are generally thought to incentivize practitioners to identify students on the margin of eligibility for special education and to identify students on the margin of a low- or high-need eligibility category as high need. Although empirical research is limited, studies have suggested that switching to a census-based system may indeed reduce identification rates for students with disabilities and remove incentives to qualify students for specific eligibility categories (Dhuey & Lipscomb, 2001; Tuchman, 2017).

In addition, states can develop strategies that promote cost stability and protect LEAs from the wide variations and fluctuations of special education costs. One strategy is to build funding policies based on the assumption that special education costs are more predictable across a geographical area or state than they are at the local level. A common way to harness this strategy is through state-run high-cost pools. State-run high-cost pools provide additional funding to LEAs facing a high-cost educational program or legal expenses. High-cost pools protect a portion of funds allocated for the education of students with disabilities, and then the SEA distributes these funds, often through an application process or formula with state-defined parameters and definitions, when unforeseeable high costs arise, thereby protecting qualifying LEAs from local volatility.

Although Tuchman (2017) found that a switch to census-based formulas increased the percentage of students with high-need disabilities in nonpublic schools, the author also concluded that decoupling funding and student characteristics through the census-based system increased district reliance on the state high-cost pools. LEAs subsequently found more students eligible for high-cost and more-restrictive placements, services that were better able to qualify for the high-cost pool (Tuchman, 2017).

Data and methods

Researchers used the 2011 Early Childhood Longitudinal Study of Kindergarten to answer the research questions in this section. The ECLS-K is advantageous because it starts tracking students at the onset of their kindergarten year. In larger national data sets, such as the National Assessment of Educational Progress, it is only possible to observe performance at a static moment in a child's schooling (fourth grade or eighth grade, for example). Little is known about their family life, cognitive ability, and social-emotional development prior to elementary school. For reasons more fully articulated below, the lack of pre-elementary data will hamper the ability to draw any causal conclusions from analyses such as this because family background and student development prior to kindergarten can covary with state K–12 funding policies. The ECLS-K 2011 also includes a rich set of outcomes lacking in national data – in particular, standardized measurements of social-emotional learning (SEL). These are especially important variables for assessing how school finance policies impact elementary school students with disabilities in a durable manner, as SEL measures are more predictive of academic success and labor market performance than traditional measures of cognitive achievement.

The ECLS-K 2011 data also include information on children's disabilities. For 11 disability categories, the team only coded a child as having that condition if the child's family answered affirmatively to the relevant question in any of the survey waves in which the question was asked. For the 12th category, Multiple Disabilities, the researchers created a binary variable that is recorded as a 1 if the child's family marked "Yes" for more than one disability category. The final analysis set did not include students in a 13th category, which identifies students with deafness and blindness.

The drawback of the ECLS-K 2011 is the limited sample size. With only 2,100 students with disabilities, the power to detect effects in the range typically found in school finance research — .1 to .2 standard deviations — is quite low. Consequently, this analysis should be considered suggestive in the sense that many substantively important effects may not be statistically distinguishable from zero and only the largest effects may be found.

The treatment variables come from information gathered on state policies, as detailed in Section 1.

The primary variables for the study are as follows:

- **Differ:** a binary variable for which 1 means state revenue is differentiated by type of disability and 0 means otherwise.
- **Actual:** a binary variable for which 1 means that state revenue is provided for the true count of students with disabilities and 0 means otherwise.
- **Per-Pupil Revenue:** a continuous variable equal to the amount of revenue (in thousands) that each state provides for a given ECLS-K 2011 student's disability category.
- **English Language Arts:** a standardized continuous measure of literacy skill, with a mean of 0 and standard deviation of 1 for the entire ECLS-K 2011 in each survey wave.
- **Math:** a standardized continuous measure of numeracy skill, with mean of 0 and standard deviation of 1 for the entire ECLS-K 2011 in each survey wave.

- **Self-Control:** an ordinal measure, derived from teacher reports of student behavior on a 1:4 scale, with higher scores representing students displaying higher levels of self-control. Reliability coefficients are near .80 for most survey waves.
- **Interpersonal:** an ordinal measure, derived from teacher reports of student behavior on a 1:4 scale, with higher scores representing students displaying higher levels of interpersonal skills (prosocial behavior). Reliability coefficients are near .86 for most surveys.
- **Ext Prob Behavior:** an ordinal measure, derived from teacher reports of student behavior on a 1:4 scale, with higher scores representing students displaying greater externalizing problem behaviors (e.g., class disruption). Reliability coefficients are near .88 for most survey waves.
- **Int Prob Behavior:** an ordinal measure, derived from teacher reports of student behavior on a 1:4 scale, with higher scores representing students displaying greater internalizing problem behaviors (e.g., anxiety). Reliability coefficients are near .78 for most survey waves.
- **Approach to Learning:** an ordinal measure, derived from teacher reports of student behavior on a 1:4 scale, with higher scores representing students displaying higher levels of enthusiasm and engagement with education. Reliability coefficients are near .91 for most survey waves.
- **Works Independently:** an ordinal measure, derived from teacher reports of student behavior on a discrete 1:4 scale, with higher scores representing students having greater independence in their work.
- **Task Persistence:** an ordinal measure, derived from teacher reports of student behavior on a discrete 1:4 scale, with higher scores representing students having greater persistence in their work.

In order to make more plausibly causal claims about the relationship between state funding policies and student development, the researchers control for observed student outcomes and characteristics at the onset of kindergarten. The social, economic, and biological processes that sort children with disabilities into particular categories are likely correlated with state policy decisions in a manner that would create bias in naïve estimates of their impact on student development. For example, it may be that states that provide more generous funding for students with disabilities attract the families who are most able and willing to relocate in response to their child's disability, and such families may make other investments that enhance their child's development before the child enters kindergarten. In this scenario, a naïve correlational analysis would attribute to the state funding policy what actually should be attributed to family investments.

ECLS-K 2011 is advantageous in that it includes assessments of children at the onset of kindergarten, before state policies could reasonably have had an impact. For reference, note that state finance reforms over the past three decades have taken an average of 10 years to increase student test scores .18 standard deviations (Johnson & Tanner, 2018, pp. 45–47). By controlling for each child's literacy, numeracy, and social-emotional development prior to entering the school system, the researchers purge the impact of estimates of bias due to unobserved family or child characteristics that influenced the child's development prior to kindergarten. They also control for family characteristics such as marital status, parental education, parental age, and labor market participation. Binary indicators for each type of disability are also included in the set of controls.

The primary regression model is in this equation:

$$Outcome_{is} = \alpha + \beta_1 * Treat_{is} + \sum_{j=2}^{k} \beta_k * Control_i^k + e_i \quad (1)$$

where Outcome is the relevant test, or SEL measure, for the i^{th} student, Treat is the relevant policy variable for the i^{th} student in state s, Control is a vector of student outcomes and family characteristics measured at entry to kindergarten, and e is an idiosyncratic error term. The researchers run this model for each spring wave in the data, from kindergarten to third grade for SEL outcomes and from kindergarten to fourth grade for literacy and numeracy. Standard errors are clustered at the state level and are robust to heteroskedasticity. The researchers use the weights provided by the ECLS-K 2011 to adjust for the sampling strategy and generate estimates that are closer to population average treatment effects. Missing data are not particularly prevalent, eliminating the need for any imputations. Due to lower sample size, the researchers did not make any adjustments for multiple hypothesis testing.

The researchers tested three major variables to determine the effect on education progress and functional outcomes:

- Revenue per pupil (amount of money invested)
- Whether allocations were based on actual child or census counts
- IDEA disability category

The results of these tests are reported in detail in Appendix 5 and, as they apply to the recommendations in this report and the cost adequacy study in Section 2.5, in the conclusions and recommendations below.

Conclusions and recommendations

Overall, the researchers found modest effects of all three policy variables on a variety of student outcomes.

Conclusion 2.4.1: Although differentiating revenue by disability category does not provide a full picture of the severity of student need or intensity of services needed, differentiating revenue by disability category leads to higher numeracy outcomes and some improved social-emotional development.

First, differentiating revenue by type of disability appears to have little association with literacy skills, but does have a stronger correlation with gains in numeracy – gains that grow as students progress through elementary school. Exhibits 5-1 and 5-2 (see Appendix 5) contain the estimated effects of differentiation. The results for literacy are small and statistically insignificant across all grades. The results for numeracy become statistically significant and meaningful (0.1 standard deviations) in first grade and grow through fourth grade.

As for social-emotional development, differentiation is associated with gains in four of the seven constructs in the early grades: interpersonal skills and approaches to learning, working independently, and task persistence in kindergarten. The sizes of the effects are modest, from roughly 0.2 standard deviations of task persistence to 0.01 standard deviations of approaches to learning. Three SEL skills are associated with higher per-pupil revenue in kindergarten: self-control, interpersonal skills, and externalizing problem behaviors. The effects, although statistically significant, are quite small at 0.01 standard deviations or less.

Recommendations

To increase education and functional outcomes for students with disabilities, Maryland should consider moving from a single weight allocation model to differentiated weights and should consider the inclusion of disability categories in some way as a factor for differentiation, given the positive correlation to improved numeracy outcomes. The cost function model described in Appendix 3 and applied in Section 2.5 differentiates the allocation of special education funding based on groupings of disability categories and a student need factor that is based on state IEP data.

Conclusion 2.4.2: Providing revenue to LSSs based on actual count of students enhances numeracy throughout elementary grades.

Providing revenues to LSSs based on the actual count of students with disabilities (as opposed to a fixed amount per district or a census count) is associated with more than a 0.1 standard deviation increase in numeracy in third and fourth grades. As with Conclusion 2.4.1, this effect appears to grow throughout elementary school with the pronounced positive, strong correlations in third and fourth grades.

Although the literature warns that use of the actual count could lead to the over-identification of students with disabilities, including in specific disability categories, this study found that educational outcomes for students in those states that use actual counts are improving during the formative elementary school years.

Recommendation

Consistent with Maryland's strategic plan, which values improving educational outcomes for students with disabilities, the researchers recommend that allocations be made based on the actual count of students.

Section 2.5. Cost adequacy study

Introduction and research questions

The conclusions and recommendations in this section draw on evidence provided by the education cost function analysis. The cost function analysis is one of several methods commonly used in the area of school finance research. In this context, this analysis was used to determine the appropriate level of funding that is adequate for students with disabilities in Maryland. These levels of funding account for variation in the need of the student population and identify desired outcomes for those students. Specifically, this section addresses the following research questions:

- How does the level of student need within a given school population of students with disabilities influence the appropriate level of funding?
- What is the appropriate level of funding for all LSS/PAs to provide students with disabilities in Maryland with an equal opportunity to achieve?

The conclusions presented at the end of this section summarize key aspects of the study results and provide background understanding on the cost function analysis and how it informs the recommendations provided in the subsequent section.

Literature review

Special education funding: Adequacy

Special education presents a unique challenge in the study of educational adequacy. Programmatically, students with disabilities, unlike other students, are entitled to an individualized education program (IEP). The IEP process and subsequent contractual document is the mechanism by which members of the IEP team determine educational adequacy on the individual level (Harr, Parrish, Chambers, Levin, & Segarra, 2006). Although IDEA does not explicitly define educational adequacy, U.S. Supreme Court rulings have further clarified the FAPE requirement. Most recently, the Supreme Court opinion in *Endrew F. v. Douglas County* (2016) clarified that to meet the FAPE requirement "a school must offer an IEP reasonably calculated to enable a child to make progress appropriate in light of the child's circumstances." The phrase "appropriate in light of the child's circumstances" reflects the notion that not all students can be expected to progress at the same rate and the quote implies variation in their ability to catch up to their general education peers. Further, it is implied that the Supreme Court did not intend to ensure that 100% of all students with disabilities would be able to achieve proficiency based on state standards.

Cost cannot legally be a limiting factor in the education of students with disabilities. According to IDEA, the cost of services should not determine the extent to which they are or are not included in the IEP if they are needed to enable a child to make appropriate progress. In light of these respective programmatic and fiscal factors, unique to special education, the field largely conceptualizes the

adequacy of funding by the extent to which it enables LEAs to cover the costs of services as outlined in students' IEPs (Harr et al., 2006). This study aims to introduce various techniques that establish cost for adequacy on actual need rather than the cost to cover identified services.

Previous research has found that studies using resources (inputs) – i.e., professional judgment and evidence-based cost studies –are better suited to including students with disabilities (Harr et al., 2006). However, a limiting factor of these methods is that they cannot be reliably used to predict the amount of resources necessary to achieve specified education outcomes. Ultimately, the authors suggest that expenditure data may provide the most accurate measure of educational adequacy for students who receive special education given the professionally informed context (the IEP) in which special education services are determined. However, the authors caution that the extent to which an LEAs general education program can meet the needs of students with disabilities will impact the services required in the IEP. The quality of an LEAs general education is therefore tied to its special education expenditures and adequacy should be considered in this holistic context. (Harr et al., 2006).

A thorough descriptive understanding of special education expenditures might lend itself to further adequacy studies, but at the state level, comprehensive cost data are difficult to find, and when these data are available, they are often not comprehensive and lack a sufficient level of detail (Griffith, 2015). As a result, precisely measuring the current costs of providing special education services to children to inform the adequacy of funding across eligibility categories and levels of service is challenging. Up to this point, the most recent comprehensive, national collection of special education cost data was the Special Education Expenditure Project (SEEP) more than 15 years ago (Chambers, Shkolnik, & Perez, 2002). This study directly addresses this challenge in the research literature through the methodological approach used.

Special education funding: Equity

Directing funds to students with the greatest need can offset the wide variation in the expenditures for students with disabilities, including variation in the rates of identification across LEAs. Some funding systems provide additional funds for students based on characteristics presumed to drive a student's services and therefore predict cost such as a student's eligibility category.

Chambers et al. (2004) found that eligibility category explains only about 10 percent of the variance in special education expenditures. In the study, the authors compared the variance in expenditures explained by eligibility category with an alternative index (ABILITIES Index) designed to assess a range of characteristics across several domains of functioning. The authors concluded that the ABILITIES Index was a more sensitive measure of a student's needs and a better predictor of cost. It was able to explain an additional 15 percent of the variation in expenditures when combined with student's background information and community/regional characteristics.

The Special Education Expenditure Project (2002) included a descriptive analysis of the patterns of special education spending across district demographics: urbanicity, district size, median family income, and student poverty levels (Chambers, Parrish, Esra, & Shkolnik, 2002). These data lend valuable insight to questions of equity across schools, helping researchers better understand how districts with confounding challenges, like high rates of poverty, cope with cost pressures. The study found mixed results for spending in high- and low-poverty districts, with results suggesting that high-poverty districts

spend relatively more on students with disabilities than on general education students compared with low-poverty districts. No statistically significant difference was found between spending in rural and urban districts. The study found that small districts spent the most on special education, both in the percentage of overall spending on special education and spending in comparison to students not identified as needing special education.

Capturing variation in the level of student need among students with disabilities

It is evident from the prior literature that the needs of students with disabilities are diverse in nature and scope. Educating students with disabilities requires developing an education program specific to each student's unique, innate characteristics and skills. Any attempt to summarize these needs into a reduced selection of categories or a scale must be reconciled with the individualized nature of serving these students.

Specifically, the IEP team is charged with evaluating each student's needs independent of their peers with common characteristics. Therefore, one would not expect students with the same primary disability or specific set of skills to *necessarily* receive the same services or, consequently, the same allocation of resources. Further, each student is re-evaluated frequently with the goal of adjusting services according to the student's needs *at the time of re-evaluation*, potentially making further adjustments to the resources allocated to the student. To some extent, this type of adjustment happens for all students if the instructional program is ineffective, but the formal nature of the IEP process exacerbates the challenge of establishing valid, common summary measures of student needs and progress made in meeting those needs.

As noted in the prior section, policymakers grapple with this challenge when determining the policy mechanisms by which state funding is allocated for the purposes of educating students with IEPs. Many states use a weighting system to account for the additional resource needs within the subpopulation of students with disabilities, in some cases further separating these students based on a measure of intensity of need or service. These approaches to providing funding for students with IEPs implicitly assume that these students have additional needs requiring additional resources, and that these needs are accurately captured in the applied weight(s).

Notwithstanding the prevalence of this type of weighting system, evidence for the appropriateness of a particular weight or set of weights is limited. In fact, the most prominent study examining this topic, the SEEP study, finds available measures, including disability category, lacking in their ability to explain differences in student resource needs. Drawing on a prior measure of student skills, the ABILITIES Index, the authors document misalignment between the severity of needs reflected in the ABILITIES Index and the identified primary disability, showing that students with the same disability have varied index values, while for students with differing disabilities index values may be the same (Chambers et al., 2004).

With Chambers et al. (2004) in mind, the researchers examined the extent to which a variety of aspects of a student's IEP are explained by the assigned disability category. Specifically, this includes the number of services assigned to a given student. While imperfect, this aspect of a student's IEP serves as the most reasonable proxy available for the level of a student's resource needs.

The researchers found that, in general, the explanatory power of a student's disability category was similar to the results in the SEEP study. Based on a regression of the student's IEP data on disability category, a student's disability explains 22.7% of the variation in the number of services assigned to a student. This is compared to the SEEP study, which found disability category explained only about 10% of the variation in student-level spending. While our finding suggests the explanatory power of disability category in Maryland, in more recent years is higher than in the SEEP analysis, it also illustrates that disability category does not fully explain differences in student resource needs.

Methods and data sources

Below is a review of the methods and data sources used in the cost adequacy study investigation.

Data sources

The quantitative analysis leveraged data from multiple state data collection sources. These data sources included the following: (1) annual financial report (AFR) data, (2) the MSDE individual staff salary data, (3) MSDE attendance files (end-of year-membership), which include student demographic data, (4) public data on school and district characteristics, and (5) Maryland Online IEP data, including data contained in the IEP form. Note that some of the LSS datasets were provided directly to the researchers as a result of the LSS not participating in one or more of the aforementioned data systems. Exhibit 48 outlines the years of data obtained by dataset with a subsequent brief discussion of each of the data reports, including the years of data provided, categories of data made available, and exceptions to the information provided. Additional information on each of these data sources can be found in the methods overview section of this report in the Introduction.

Exhibit 48. Quantitative Data Sources by Fiscal Year, 2014 to 2018

Quantitative Data Source	FY14	FY15	FY16	FY17	FY18
LSS's Annual Financial Report Data (MSDE)	X	X	X	X	X
Individual Staff Salary Data (MSDE)	X	X	X	X	X
Student-level Attendance Files (MSDE)	X	X	X	X	X
Student-level Assessment Data (MSDE)		X	X	X	X
School-level Graduation Data (MSDE)	X	X	X	X	X
Public School District Characteristics Data (NCES)		X	X	X	X
Student-level IEP Data (Maryland Online IEP)		X	X	X	X
Students-level IEP Data (Files from Five LSS's)		X	X	X	X

Methods

The cost function analysis requires quantitative datasets, such as school spending, student demographic, school and community characteristic, and student outcome data in order to construct a statistical model that produces statistically significant results estimating the relationship between spending and educational outcomes. The data sources referenced in the previous section were a primary source of information and their definition and structure are consistent with prior investigations by the researchers (Taylor, Willis, Berg-Jacobson et al., 2018; Willis et al., 2019). And, as discussed previously, up to this point there have been clear limitations in assessing the adequacy of funding for students with disabilities stemming from data limitations. In particular, access to consistent student outcome datasets beyond traditional measures such as student assessments and graduation rates is limited. However, the researchers – leveraging Maryland's online IEP system – were able to construct such a measure. The section below provides further rationale and detail on this approach.

Defining operating expenditures

The cost model below uses a constructed measure of "operating expenditures," which includes the day-to-day expenses of LSSs and schools, such as salaries, benefits, purchased services, and supplies and materials. Some categories of expenditures were not considered to be operating expenditures.[17]

The aggregate amount of expenditures beyond general education per student spending is what is commonly referred to as excess cost, or those expenditures spent above and beyond the average per-pupil spending for all students. The calculated average per general education student for 2017-18 was $8,024.[18] This figure comprises state and local operating expenditures.

Similar to other states, local contributions make up the majority of resources dedicated to special education. In Maryland, LSSs contributed 71.6% of the resources required to support the defined needs of students receiving special education in their school systems. This local contribution does subsume revenues that were allocated by the state to LSSs via other components of the state aid funding formula (e.g., the basic foundation grant). The researchers were unable to obtain the amount of the local contribution that this component comprises statewide, as the practice is varied. For example, across a small sample of LSSs for which data was available, other state funding sources supplied between 18%

[17] After first restricting to expenditures and the Current Expense Fund, these excluded categories include transfers; capital outlay; food services; transportation services; fixed charges (except for employee benefits); adult education; and community services. Finally, charter schools were excluded from the analysis. Therefore, the expenditures reported represent K–12 operating expenditures in traditional schools. The inclusion and exclusion categories in this study are consistent with prior, similar analyses.

[18] This calculation is derived from the Selected Financial Data – Maryland Public Schools: 2017-18 Part 3 – Analysis of Costs. http://www.marylandpublicschools.org/about/Documents/DBS/SFD/2017-2018/SFD20172018Part3.pdf. In order to equate these publicly reported figures to the operating expenditures definition for state and local spending the following calculations were made. Total non-federal state cost per pupil belonging figure of $13,051 was taken less the following categories of spending: special education ($1,385), student transportation ($683), and fixed charges ($2,958) located on page 6. Further details report that these figures do not include expenditures for adult education, equipment, state share of teachers' retirement, interfund transfer, and outgoing transfers.

and 49% of the local contribution component.[19] Exhibit 49 provides a further breakdown of operating revenue.

Exhibit 49. Revenue for Special Education by Source, 2017-18

Funding Source	Total Revenue or Contribution ($ in millions)	Average per-pupil spending	Percentage (%) of total
State	$284.9	$2,781	11.2%
Local	$1,186.3	$11,575	71.6%
Federal	$185.9	$1,814	17.2%
Total	$1,657.1	$16,169	100.0%

Source: MSDE, Annual Financial Report, FY 2014–2018; authors' calculations based on cost function model analysis.

Measuring the success of students with disabilities consistently and for the purpose of distribution of funding and accountability for spending

As with all public funding, there is an obligation to ensure that education funding is being used effectively and for the purpose set forth by the legislature. In Maryland this includes ensuring funding is sufficient to meet the standard for educational quality established in the state constitution, and that educational outcomes provide sufficient evidence of equal opportunity for all students.

Given this obligation, estimating the level of resources appropriate to serve students with disabilities requires outcome measures that demonstrate necessary services have been sufficiently provided to achieve the intended outcomes. Identifying such outcome measures is not a simple matter for the general education population and is only more complex and contested within the population of students receiving special education services. Given the nature of students' disabilities and the individualization of educational objectives and plans, many students requiring special education are not necessarily able to demonstrate their learning through standardized assessments.

Other measures used to determine outcomes for students with disabilities as a group were established by the U.S. Department of Education Office of Special Education Programs' (OSEP's) mandatory State Performance Plans and Annual Performance Reports. Through those reports, Maryland and other states have reported to OSEP annually since 2005 on multiple outcome and process indicators.[20]

[19] A review of Maryland's Individuals with Disabilities Education Act (IDEA) Maintenance of Effort (MOE) Compliance Template & Certification for the 2017-18 state fiscal year was used to draw a sample from those LSS's in which data was available.
[20] Examples include proficiency on statewide exams, graduation and drop-out rates, post-school outcomes including employment and enrollment in higher education and training programs, early childhood outcomes, parent satisfaction with

In addition to these data points, IEP teams are required to determine progress against each child's IEP goals annually, another potential measure of adequacy of services, and thus, of funding. In March 2017, the United States Supreme Court emphasized that "every child should have the chance to meet challenging objectives" (Endrew F. vs. Douglas County, 2017). This case raises the question of measuring appropriate progress or educational benefit. Individualized programs for students with disabilities must be designed to provide "educational benefit," which has been defined as present levels of performance from various sources, linked to goals and objectives; accommodations that address the student's disability; and specially designed instruction beyond what all students receive (Yell & Bateman, 2017).

Notwithstanding the above complexity of measuring educational benefit or student academic success, it must be independent of the location in which a student is served and thus available for all students and all service locations. No available measure currently meets the above standard perfectly. However, while imperfect, state standardized tests and graduation rates offer the most consistency and their validity is implicit in their use as part of the statewide accountability system. Further, these measures are reflected in the state strategic plan for measuring success among students with disabilities. Given the above, the researchers believe the use of these outcome measures to estimate an adequate level of funding is appropriate.

Establishing an additional outcome measure appropriate to students with disabilities

The researchers recognized the limits of these traditional measures, and with this in mind identified an additional outcome measure that complements the other measures. This measure is based on IEP goal progress and reflects the extent to which a student was able to make progress on their IEP goals over the course of a year. As Maryland's IEP Process Guide states, "Annual goals and their accompanying objectives/benchmarks define the focus of the specially designed instruction that the student will receive in order to enable him or her to make progress in the general education curriculum."[21] The guide further states that the goals must be aligned with the Maryland College and Career Ready Standards (or the Maryland Alternate Academic Standards).

To construct this measure, the researchers relied on the progress toward goal metric that underlies the multiple goals established for each student. There are five possible progress codes that IEP teams can report for students which include: (1) achieved, (2) making sufficient progress to meet goal, (3) newly introduced skill with progress not measurable at this time, (4) not making sufficient progress to meet the goal, and (5) not yet introduced. The manual notes that, "progress determination should be based on data." In looking at the distribution of the IEP progress towards goal measure, the qualifying categories to assess progress are contained in three of the five codes: achieved, making sufficient progress to meet goal, and not making sufficient progress to meet the goal. Across these codes, the

special education services and the IEP process, meeting the timelines outlined in IDEA for development of IEPs and transition from early intervention services as well as the numbers of mediation, complaints, and due process hearings that resolve disputes between parents and LSS/PAs.

[21] Maryland State Department of Education: Division of Early Intervention/Special Education Services. April 1, 2019. *Maryland Statewide Individualized Education Program (IEP) Process Guide.* Baltimore, MD. Accessed: November 2019. http://marylandpublicschools.org/programs/Documents/Special-Ed/IEP/MarylandIEPProcessGuide.pdf

majority of IEP teams marked "making sufficient progress to meet goal" representing approximately 73% of instances in the 2017-18 school year.

Importantly, IEP teams need strong evidence to suggest that the student is not making sufficient progress. This is supported by guidance from the state manual stating, "If the student is 'Not making sufficient progress to meet the goal', the IEP team must meet to discuss the student's lack of expected progress and the changes that will be made to the student's specially designed instruction (SDI) in order to improve the student's rate of progress."

With this in mind, the researchers relied on the variance within this progress code across students and schools to establish the measure. This new outcome measure is discussed in more detail in Appendix 4.

Creating a measure of student need beyond disability category

As discussed in the research literature and recognized by practitioners during the researchers' engagement in the state, disability category provides a dimension of student need but is limited in both its explanatory power and the lack of variance within disability category.

Exploratory factor analysis (EFA) is a statistical procedure used to discover unobserved (latent) constructs. Among the information available on a student's IEP, there is likely a network of relationships between designations. In fact, there may be specific designations, or components, that map to a single latent construct, such as "core academics" or "communication." For example, the focus area of Math Calculation may be common among students with the focus area of Math Problem Solving, or the focus area of Reading Comprehension may be more common among students with the focus area of Reading Fluency. Other, less intuitive relationships may also exist, such as between Speech and Language Articulation and Social Interaction Skills. However, there may be specific designations, or components, that map to a single latent construct, such as "core academics" or "communication." The number of components may be as many as needed to fully explain the construct. EFA allows for researchers to explore, statistically, whether observed IEP-based components relate enough to point to an underlying construct of student need.[22]

Notwithstanding its benefits, EFA proved a formidable method of investigating constructs that exist within the IEP-based needs assessment. Ideally, one would have both detailed categories of need identified and some consistent assessment of the severity of need for each. This type of information would provide enough variation student-to-student to better understand what particular needs relate most strongly. At present, these data were not available in the information provided to the researchers.

Severity of need is not assessed in a student's IEP in any district. The level of detail with which needs were identified varied significantly district-to-district. For example, a student in one district who is identified as needing help in Math Calculation, Math Problem Solving, and Math Reasoning could be identified in another district more generally as needing help in Math. As a result of this variation, it was

[22] EFA can also be used to examine relationships between constructs. For example, is there an association between "speech and language skills" and "writing skills"? The possibility that this sort of cross-construct association was incorporated into this study's factor analysis.

necessary for the researchers to iteratively develop measures working from more detailed information to less detailed information. Ultimately, it was the desire of the researchers to develop a measure that explains the needs of students within the IEP needs assessment.

In summary, the researchers were able to use EFA to identify specific areas of need within three broad categories: math, reading, and writing. These three areas proved to be the strongest along a variety of test measures, and the underlying components resulted from the triangulation of multiple approaches to conducting the EFA. This is expounded upon in Appendix 4.

Implementing the cost function analysis to determine the cost of an adequate education for students with disabilities in Maryland

The cost function analysis is a performance-oriented method that provides a systematic and statistically rigorous way to calculate the relationship between spending and education outcomes while controlling for differences in student needs, district characteristics, and geographic variation in cost. The Maryland education cost function was estimated using a stochastic frontier analysis (SFA). SFA is an estimation technique that allows for the possibility that the expenditures might exceed minimum cost for one of two reasons: random errors or inefficiency.[23] If there is no inefficiency, then SFA will yield the same model estimates as ordinary regression analyses. However, if there are inefficiencies, then SFA will yield a better prediction of the cost of education than will other estimation techniques. Because research has indicated that a variety of factors can lead to school district inefficiency, SFA is the most appropriate estimation technique for this analysis.[24] What follows is a further explanation of an approach that contributes to the literature – a method and approach that directly addresses previously cited limitations from the SEEP study and associated publications. This approach thereby offers insight to Maryland not before seen in this field of study.

Formally, the cost function model used in this analysis can be expressed as:

$$\ln E^* = \ln C(w_1,\ldots w_k; z_1,\ldots z_k; y, N \mid \beta) - \ln N + v + u(x,\delta) \qquad (1)$$

where E* is observed expenditures per pupil in the school, w_1 are input prices, z_1 are quasi-fixed inputs including environmental factors, y is a vector of outcomes, N is the number of students, ß is the cost parameter vector to be estimated, v is the random noise component representing exogenous random shocks (e.g., noisy private construction outside on testing day), and u is the one-sided error term that is a function of factors impacting inefficiency (x) and a parameter vector (δ).

The design of the equation (1) treats school enrollments and outcomes — both of which are influenced by the decisions of school administrators — as independent variables, raising concerns about possible

[23] Specifically, it assumes that the random errors consist of two parts, a standard two-sided random error that may be positive or negative and is zero on average and a one-sided error that is always positive or zero. The greater the one-sided error, the further a school is from the minimum and the more "inefficient" its spending.

[24] For example, see Belfield and Levin (2002); Dee (1998); Gronberg, Jansen, Karakaplan, and Taylor (2015); Duncombe and Yinger (2005); Grosskopf, Hayes, Taylor, and Weber (2001); Kang and Greene (2002); and Millimet and Collier (2008).

endogeneity (i.e., a relationship between the explanatory variables and the error terms).[25] This analysis follows a control function approach to address the potential endogeneity of the outcome and enrollment measures.

The key strength of a cost function over alternative methods is that it is able to use the observed experiences of nearly all public schools in the state, rather than relying on a sample of experiences or settings whether by way of a selected group of practitioners (i.e. professional judgment), a selected sample of schools (i.e. successful schools), or a selection of research studies tested in a small number of environments, in some cases outside of the state (i.e. evidence based).

Another benefit of the cost function is its ability to take into account the impact of how aspects of environmental context can influence the relationship between spending and outcomes, often referred to as "cost factors." A few of the key cost factors included measures of a school's level of student need, its operational scale, and the local regional costs relative to other parts of the state.

With respect to student need, it is well-established that students with greater needs require different and often more resources to achieve a target outcome, thus impacting spending. It is also well-established that a school operation (i.e. school) that is larger in scale is able to pay less per student than a smaller operation to provide the same opportunities (i.e. economies of scale). Finally, the cost to purchase the same resource will vary regionally due to differences in cost-of-living or local economy, also impacting this relationship. These cost factors are discussed in more detail in Appendix 4.

Conclusion and recommendations

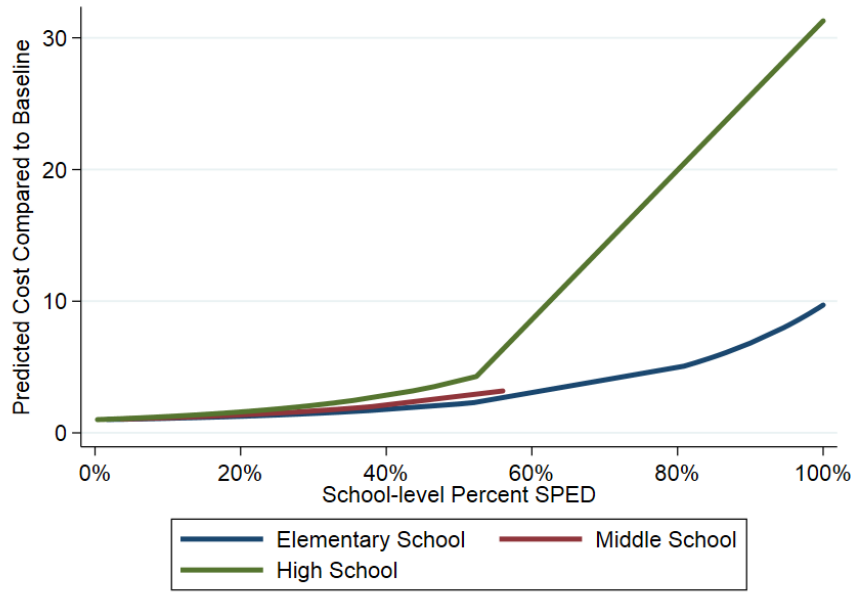
The conclusions and recommendations presented below are derived directly from the results of the cost function analysis. For further detail on the model results including the statistical significance of introduced variables of the cost model please see Appendix 4.

Conclusion 2.5.1: Greater concentrations of students with disabilities increase funding needs.

The cost function analysis suggests that the cost per-pupil generally increases as the proportion of students in special education increases. This relationship is displayed in Exhibit 50 below, separated by school level (elementary, middle and high school).

[25] For example, see the discussions in Duncombe and Yinger (2005, 2011); Imazeki and Reschovsky (2004); and Gronberg, Jansen, and Taylor (2011a).

Exhibit 50. Costs of educating students with disabilities as proportion of students increase



Source: Authors' calculations based on cost function model analysis

The cost for high school students grows exponentially and faster than for elementary schools. The researchers believe this is occurring because of a larger proportion of low-incidence and high cost services necessary for those students to access a differentiated curriculum and single-subject courses as compared to elementary school. Further, as discussed earlier there are large proportions of high-incidence disabilities (e.g., development delay and speech and language disabilities) that do not cost as much per student.

Recommendations

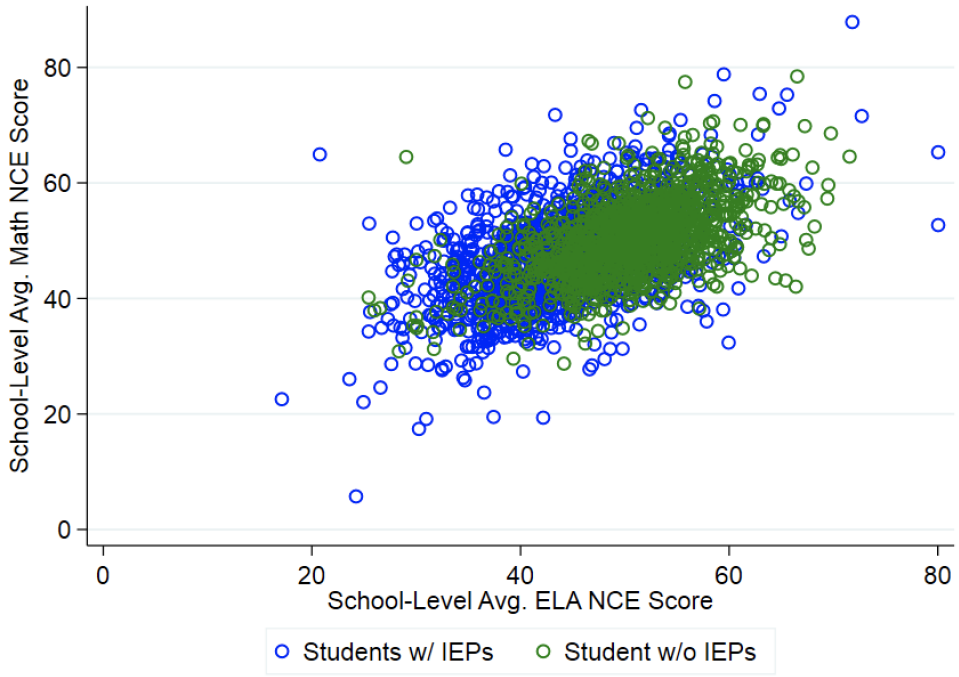
This statistically significant relationship between the predicted cost compared to baseline and the proportion of students with disabilities in a school setting suggests that Maryland should apply this factor in some form to their funding formula for special education. This is discussed in further detail in Conclusion 2.5.4.

Conclusion 2.5.2: Students with IEPs have varied rates of growth in ELA and math by school.

The researchers constructed a school-level academic growth measure (referred to in this report as a conditional normalized curve equivalent (NCE) score) for both ELA and math. This growth measure was calculated for both students with IEPs and students without IEPs. This was important in the context of the study because in constructing the cost estimates for the cost adequacy study, the researchers needed to be able to identify the amount of growth necessary for students with IEPs to catch up with students without IEPs. The researchers find a positive correlation between ELA and math outcomes for

students with IEPs as well as students without IEPs. This is consistent with previous research showing the correlation between performance on ELA and math assessments, given the necessity of a student to be able to read in order to access content in mathematics.

Exhibit 51. School-level average math by ELA NCE score, 2017-18



Source: Authors' calculations based on cost function model analysis

This chart displays the clear, overall lower performance levels for students with IEPs compared to those without IEPs. Yet, there are band of schools in the upper right-hand quadrant that appear to be exceeding average growth for students with IEPs in both math and ELA.

Recommendations

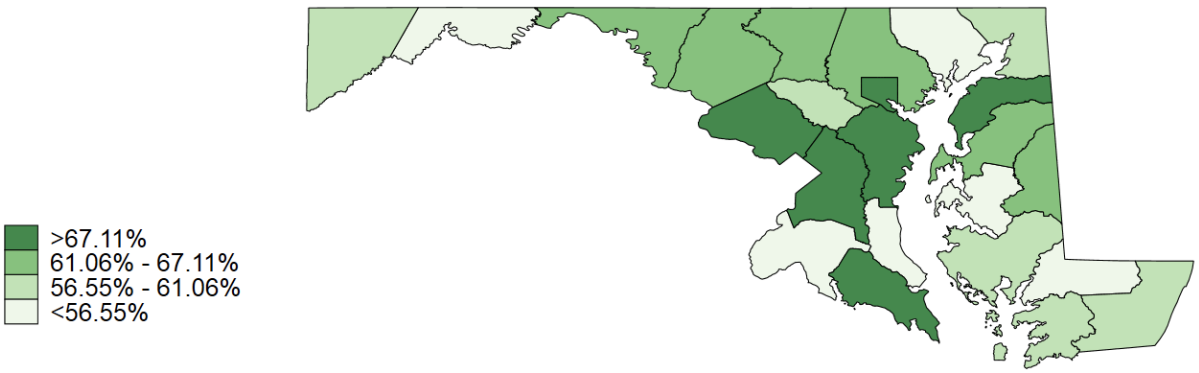
Schools that are exceeding the average ELA and math NCE scores, once accounting for student needs, may serve as examples of effective practice for which the results of this study can be used, in combination with learning visits to such school environments, providing the opportunity for practitioners to explore, document, and transfer effective practices from one learning environment to another.

Conclusion 2.5.3: There is an observable and variable need within disability categories on the basis of reading, math and writing.

As described in the methods, prior research into the resource needs of students with disabilities suggest that these needs vary substantially within disability categories. This points to the value of another

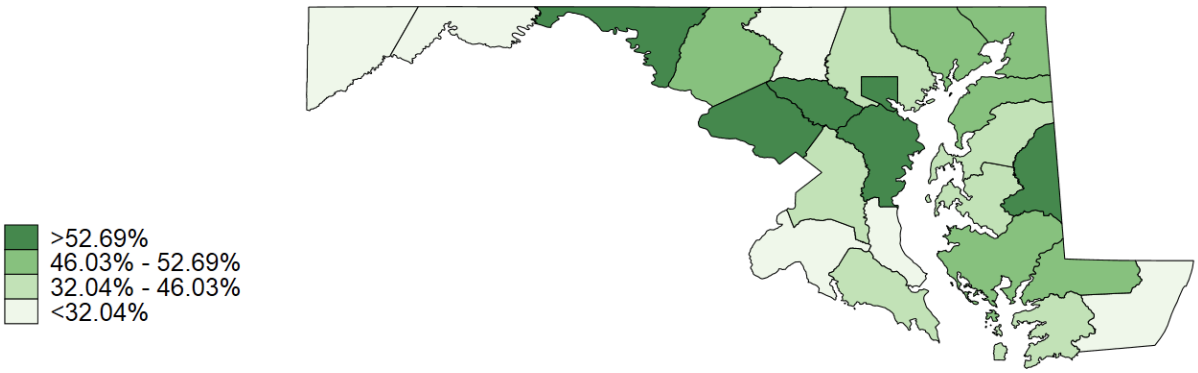
measure of student need within students with disabilities that complements disability category. The researchers were able to use EFA to identify specific areas of need within three broad categories: Math, Reading, and Writing. These three areas proved to be statistically robust along several test measures, and the underlying components resulted from the triangulation of multiple approaches to conducting the EFA. Exhibits 52, 53, and 54 display the variation in the percentage of students identified with needs in each of these three categories by district. The darker green represents a more pronounced and concentrated need within the school district among students with disabilities. The scale is 0% to 100%.

Exhibit 52. Variation in Reading Student Need for Students with Disabilities, 2018



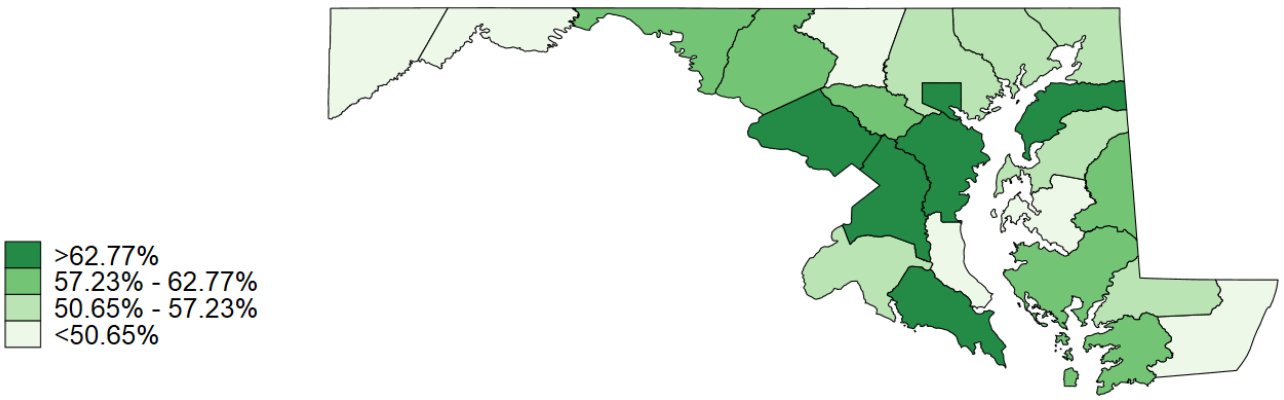
Source: Authors' calculations based on cost function model analysis

Exhibit 53. Variation in Writing Student Need for Students with Disabilities, 2018



Source: Authors' calculations based on cost function model analysis

Exhibit 54. Variation in Math Student Need for Students with Disabilities, 2018



Source: Authors' calculations based on cost function model analysis

The variation in student needs according to this analysis displays some clear areas of need across Maryland LSSs. Consistently, LSSs such as Montgomery, Prince George's, Baltimore City, and Anne Arundel are in the top quartile of need.

Recommendations

Researchers used data collected by Maryland for all students' IEP data to conduct an analysis that provided positive delineation across various academic categories. In an effort to more distinctly direct resources to students with higher needs within the students with disabilities population, Maryland should use these need categories as a component for the distribution of funding, in combination with category of disability cost and the concentration of students with disabilities in school settings, further discussed in Conclusion 2.5.4.

Conclusion 2.5.4: Weightings by groups of disability category, and supplemented by reading/math and writing need, appropriately account for student need among students with disabilities.

The primary focus of the cost model was to determine the variation in resource needs of students with disabilities in order to effectively differentiate the allocation of resources. To ensure the final cost estimates took this variation into account, three types of measures were introduced:

- Overall population of students with IEPs
- The population of students with disabilities within each disability category
- The population of students identified in three broad categories of needs developed through the factor analysis discussed in Conclusion 2 and further explained in Appendix 4.

The cost model produced significant and positive effects of cost by the overall population of students with IEPs, as discussed earlier. The cost model also produced significant and positive effects of cost by disability category. That is, disability categories had meaningfully different associated coefficient estimates that imply different levels of cost associated with students in that category. The researchers ranked the coefficient results from the cost model from highest to lowest and grouped disability categories based on similar coefficient results. This approach stands to reason because it groups categories according to the size of their associated additional cost. Exhibit 55 provides the disability categories and their associated summary category. Appendix 4 provides the statistical results and coefficients for each of the summary categories.

Exhibit 55. Groupings of Disability Categories by Associated Cost Model Coefficient Estimates

Disability Summary Category	Disability Category
Highest Cost	Orthopedic Impairment Traumatic Brain Injury
High Cost	Emotional Disability

Disability Summary Category	Disability Category
	Hearing Impairment/Deaf/Deaf-Blind[26]
Medium Cost	Autism
	Developmental Delay
	Intellectual Disability
	Speech or Language Impairment
Low Cost	Specific Learning Disability
	Other Health Impairment
	Visual Impairment
	Multiple Disabilities

Each of these summary categories produced a weight, with the highest weight assigned to the Highest Cost summary category, the next highest weight assigned to the High Cost summary category, and so on. Again, this stands to reason, as the cost on the basis of the typical level of services and type of service are higher for those disability categories in the Highest Cost summary category than for those in the Low Cost summary category. For example, students with an orthopedic impairment may more often require equipment and assistance to prepare them for learning in the classroom, compared with a student with a specific learning disability who is more often in a general education setting and may be provided some additional push-in support from a resource specialist or an instructional aide.

However, as the researchers understand, and as various stakeholder groups in Maryland reinforced, differentiating only on the basis of disability category still leaves an unanswered question about the variation of student needs within the disability category. In order to address this issue, researchers used the constructed student need variable outlined in Conclusion 2.5.3 as the basis to differentiate resources by need within the summary disability categories identified in the table above. In order to do this, the researchers introduced a measure of three types of student need to signal need beyond the amount designated by the disability category grouping alone: functional (other) need, reading and/or math need, and writing need. Determining the proportion of students within each cost grouping of disability categories allowed the researchers to generate marginal, necessary cost increases above the disability summary category weights to recognize the costs associated with the functional goals for a student with disabilities, but also to recognize the academic needs associated with the student. Exhibit 56 displays the proposed weights by disability summary category (rows) by the need category (columns).

[26] The disability categories of hearing impairment, deaf, and deaf-blind were combined into a single category due to their likeness in the student's functional need and their low number of students in those categories not provide sufficient statistical power to establish weights.

Exhibit 56. Weights for Types of Needs within Grouped Disability Categories

Disability Summary Category	Functional (Other) Need	Reading and/or Math Need	Need Percent (%)	Writing Need	Need Percent (%)
Highest Cost (Orthopedic Impairment, Traumatic Brain Injury)	2.8779	2.8353	71%	2.8929	46%
High Cost (Emotional Disability, Hearing Impairment/Deaf/Deaf-Blind)	1.4885	1.4832	45%	1.4900	50%
Medium Cost (Autism, Developmental Delay, Intellectual Disability, Speech or Language Impairment)	1.2396	1.2825	58%	1.2500	46%
Low Cost (Specific Learning Disability, Other Health Impairment, Visual Impairment, Multiple Disabilities)	1.2089	1.1382	94%	1.2132	61%

Source: Authors' calculations based on cost function model analysis

The last step in the process of constructing the weights was to regress the results of the weightings within the functional (other) need, reading and/or math need, and the writing need against one another to produce four weights expressed by the summary disability category. Exhibit 57 presents the results of those analyses including the final weights.

Exhibit 57. Proposed Weights to be used in Maryland's Funding Formula for Students with Disabilities

Proposed Weight Displayed by Summary Disability Category including Need Factor	Weight
Highest Cost (Orthopedic Impairment, Traumatic Brain Injury)	2.8504
High Cost (Emotional Disability, Hearing Impairment/Deaf/Deaf-Blind)	1.4846
Medium Cost (Autism, Developmental Delay, Intellectual Disability, Speech or Language Impairment)	1.2926
Low Cost (Specific Learning Disability, Other Health Impairment, Visual Impairment, Multiple Disabilities)	1.1426

Source: Authors' calculations based on cost function model analysis

Recommendation

Evidence from the state-by-state scan, the state weights study, and the cost function analysis all suggest that Maryland should implement differential weights for funding special education instead of the single weight used in the current funding formula. Further, the cost function analysis demonstrates the ability to incorporate student need on the basis of reading, math and writing need into the calculation of weights by disability summary category. Maryland should use these weights to distribute the current state revenue allocation for special education and the proposed increase in funding identified as ongoing investments below. The calculation for the application of these weightings in Maryland are presented in Section 2.6 below.

Conclusion 2.5.5: Closing the academic achievement and graduation gaps between students with disabilities and all students requires short-term and ongoing investments beyond current Maryland investments.

In order for the state to meet the requirements of adequacy in special education, it needs to increase funding in two ways: (1) make short-term investments over the next ten years to reduce the gap between students in special education and their general education peers, and (2) in tandem, provide additional ongoing funding (i.e., funding that would be maintained during and after ten years of short-term investment) to ensure that once students reach desired performance targets, this growth will be maintained. Accordingly, after the short-term investment period — assuming all students are performing to the best of their ability and the students' circumstances — the state would focus on maintaining the ongoing funding levels.

This study presents several options for the new short-term investments over ten years and new ongoing investments in the K–12 education system to provide the state with options for improving the distribution and adequacy of funding for supporting students with disabilities. In considering the level of funding necessary to achieve the standard of an adequate education, it is important to consider the conclusions of this section in tandem with the conclusions from other sections of the report, particularly those that recommend additional and differentiated support to LSSs to more effectively use their resources to support students with disabilities. For example, if the state only invests additional dollars in special education without changing the mechanisms for distributing funding to LSSs and without the increased differentiated support and monitoring tools to ensure LSSs effectively implement evidence-based practices with fidelity, then it is less likely that the desired student outcomes will be achieved.

To determine the adequacy of education funding, student performance thresholds need to be used — such as statewide graduation rates, statewide percentages of students meeting state standards in English Language Arts (ELA) and Math, and IEP goals progress — as benchmarks for observing the costs associated with students and schools achieving those results. Through the course of this investigation, the state did not specifically identify such thresholds. Therefore, the adequacy component of this study, and thereby this conclusion, presents various possible thresholds of performance and calculates the financial investments required to meet these targets. Specifically, the researchers identified financial investments linked to achieving student performance levels identified in the ESSA state plan and those

necessary to reach adequacy requirements. The adequacy results also presume that the state will incorporate recommendations associated with the distribution and implementation of evidence-based practices to maximize the effectiveness of the state's additional investment. The results for each of these target threshold scenarios are reported in Appendix 4.

After reviewing the various possible threshold scenarios and, based upon the cost model and the use of the ongoing and short-term scenarios, the researchers recommend increasing funding over the next ten years as described in Exhibit 58.

Exhibit 58. Proposed Ongoing and Short-term Increase in Funding Support for Students with Disabilities

Total Short-term and Ongoing Increases (made over 10 years) Compared to Current Spending for Special Education	Current (2017-18)	**Ongoing Increase per Year**	**Annual % Diff. with Ongoing Increase per Year**	**Average Short-term Increase per Year**	**Annual % Diff. with Short-term Increase per Year**
Estimated state spending and local contribution ($ in millions)	$1,471.2	$75.4	5.1%	$218.9	14.9%
Per-pupil cost estimate ($)	$14,356	$775	5.1%	$2,252	14.9%

Note: Dollar values are in June 2019 terms. Adjusted for inflation to 2019 dollars use the Bureau of Labor Statistics cost price index (CPI) calculations over the period July 2018 to July 2019. These figures would need to be further adjusted for inflation over the next 10 years.
Source: Authors' calculations based on cost function model analysis

Recommendation

Maryland should invest the additional amounts of resources noted in Exhibit 57 above according to the type of investment, ongoing or short-term, as identified.

Section 2.6. Recommended funding formula to adequately fund growth for students with disabilities in Maryland

The researchers employed a mixed-methods research design to combine analyses of quantitative and qualitative data sources to study the IEP process and the adequate funding level for students with disabilities in Maryland. Given the conclusions throughout this report, the researchers recommend an increased investment in and revised formula for calculating support for students with disabilities in Maryland. This section provides a description of the revised formula, supported by evidence and data reported in Sections 2.4 and 2.5.

Summary of study conclusions

The MSDE DEI/SES has a robust system of technical assistance that provides useful support to LSS/PAs to improve results for children with disabilities (Conclusion 1.1.1). MSDE has demonstrated that through technical assistance and supports to LSS/PAs, it can change practice. For example, MSDE DEI/SES has prioritized and successfully increased the proportion of children with disabilities placed in the regular education classroom for the majority of the school day (Conclusion 1.1.2) and is a leader in the country in ensuring students have access to general education.

The main focus of the DEI/SES Strategic Plan is to close the gap in outcomes between students with disabilities and all students in Maryland. However, assessment and graduation data show that the gap persists for students with disabilities. In 2017–18, only 11.25% and 11.5% of students with disabilities were proficient on ELA and math exams, respectively. By comparison, the statewide proficiency rates for all students were 37.0% for ELA and 46.0% for math. These data suggest that current levels of services and programming are closing the gap and producing improved academic achievement for students with disabilities.

The Maryland Online IEP system provides a valuable statewide tool that facilitates consistent and compliant IEP development (Conclusion 1.2.2). The IEP data in MOIEP can inform policy and programmatic decisions, including this recommended formula, given the mandatory participation in and high levels of compliance with the requirements for IEP development observed therein. The researchers reviewed data from nearly 100,000 students across multiple years to learn more about the needs and achievement of students with disabilities in Maryland.

The researchers' review of current LSS spending on students with disabilities found that LSS spending is currently more closely related to the wealth of the LSS and local revenue than to needs of the students (Conclusion 2.1.1). Maryland's current funding formula for students with disabilities provides funding for each student with a disability based on one assigned weight for disability category and does not differentiate by any additional factors. The state weight study (Section 2.4) found that although differentiating by disability category does improve numeracy and some social-emotional outcomes, such

differentiation alone does not provide a full picture of the range of student needs within disability categories. The study also found that providing revenue to LSSs based on actual counts of students enhances academic outcomes.

To appropriately account for the needs of students with disabilities within Maryland, the weights presented in the recommended formula were calculated, through the cost function, based on three conclusions: (1) greater concentrations of students with disabilities increase funding needs (Conclusion 2.5.1); (2) weighting funding by groups of disability categories, sorted by cost, leads to improved outcomes (Conclusion 2.4.1); and (3) differentiation based on student need in the areas of reading, math, and writing addresses the range of need within disability categories (Conclusion 2.5.4).

Recommended Funding Formula

The researchers used the study conclusions derived from their review of the literature and Maryland's IEP process, along with multiple quantitative methods including exploratory factor analysis and a cost function study, to develop a recommended funding formula for students with disabilities in Maryland for the next 10 years. If the recommended increases are made and the funds are distributed by the mechanisms described in this section and if the funds from the increase are used to implement evidence-based strategies, then the formula should result in improved academic achievement and functional outcomes for students with disabilities.

The cost function study used multiple data points including performance, spending, and student need (as calculated from multiple IEP data points) to identify two types of increased investment are needed to adequately close the academic achievement gap for students with disabilities in Maryland. The cost function study calculated the required investment amounts to achieve the desired academic and functional outcomes in the model: improved graduation rate, performance on statewide ELA and math tests at the same proficiency rates as all students, and sufficient progress to meet IEP goals. The recommended model is based on the state's ESSA plan and, when funded at the recommended rates, meets the goal of bringing the performance of students with disabilities up to the goal set for all students. Specifically, this includes proficiency levels of 67.8% in math and 71.3% in ELA, by 2030. With respect to graduation rate, the state aims for students with disabilities to reach a four-year cohort graduation rate of 74.9% by 2020.

Recommendation 2.6.1. Make a series of short-term investments in supplemental interventions for students with disabilities that go beyond their special education services to close the achievement gap between students with disabilities and all students.

To meet the proficiency and graduation goals for all students with disabilities, a series of short-term investments must be made over the next 10 years to provide supplemental interventions to students with disabilities beyond the special education and related services provided through their IEPs. Although these supplemental interventions should coordinate with and build on the services in a child's IEP, these interventions are provided in addition to FAPE for accelerated growth toward academic achievement. A

framework for evaluating levels of evidence for strategies and more information on evidence-based strategies drawn from the MSDE DEI/SES Strategic Plan are presented in Recommendation 2.6.4.

As described in Recommendation 2.6.4, Maryland must take steps to ensure that these funds are used for evidence-based strategies and that they are targeted toward students with disabilities who will receive the most benefit from supplemental intervention. Decisions about who would benefit from supplemental services should be data-driven and made by local school leadership teams.

The researchers recommend providing a total of $2 billion in short-term funding over the next 10 years, at the annual rates shown in in Exhibit 59. Scaling up over the next two years will allow the state to develop a system for identifying the LSSs to which funds will be allocated and for targeting groups of students to receive supplemental intervention.

Exhibit 59. Amounts of Short-Term Investment, by Year

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Short-term investment	$52M	$152M	$227M	$277M	$277M	$277M	$277M	$277M	$152M	$51M

For the short-term investments, the researchers recommend that the investments be tracked with a separate fund code and reported separately on both budget and expenditure reports submitted to the state by LSSs. It is important that the funds be tracked separately and that the LSS be able to demonstrate to the MSDE and the General Assembly that the investment was used for its intended purpose.

The researchers recommend that the General Assembly or the MSDE impose these additional restrictions on the use of the short-term investments:

- The short-term investments must be used to supplement and not supplant the current educational program of each student (i.e., they must be used for interventions beyond their special education and related services).
- The short-term investments must be used to supplement and not supplant current school improvement initiatives.
- The short-term investments may only be used to provide interventions to students who are identified as students with disabilities or whom the LSS has identified as being at risk for being identified as a student with a disability.
- The short-term investments may not be used to provide special education and related services. All interventions provided using the short-term investments must supplement the special education and related services required by a child's IEP for FAPE. Children will not have an individual entitlement to any supplemental interventions that go beyond the IEP.

Federal maintenance of effort requirements

There are two important federal requirements that the MSDE and LSSs must consider as they increase their investments both in both special education and related services and for supplemental interventions to close the academic achievement gap, that, as recommended by this section, are provided in addition or on top of FAPE for students with disabilities. The IDEA regulations at 34 CFR §300.163(a) require that states continue to make available at least the same amount of state financial support from one year to the next for the education of children with disabilities. Each state must report annually the total amount of funds made available for special education and demonstrate that it has maintained the level available in the previous year. Although a state may report the amount in total or per capita, allowing for a reduction in funds made available when there is a decrease in the number of children identified as students with disabilities, there are no other waivers or exceptions that allow a state to reduce the amount made available.

LSSs are subject to a similar LEA maintenance of effort (MOE) requirement at 34 CFR §300.203. An LSS meets the MOE compliance standard if it does not reduce the level of expenditures for the education of children with disabilities made from either state and local funds, or local funds only, below the level of those expenditures from the same source for the preceding fiscal year. The LEA MOE test also can be done by using total amounts expended or per-capita amounts expended. The LEA MOE test does include exceptions, including for the reduction in the number of students with disabilities.

As the state of Maryland and LSSs increase investments in special education and in closing the achievement gap, they should consider the potential ramifications of those increases, as they will be responsible for maintaining that level of effort unless these investments result in a decrease in the number of students identified for special education or other allowable exceptions. The additional fiscal and programmatic restrictions on short-term investment funds described in recommendation 2.6.4 will help ensure that funds are spent not on special education, but on additional interventions for students aimed at closing the achievement gap.

Recommendation 2.6.2: Increase the overall investment in Maryland's special education funding formula and allocate the increased funding to LSSs by applying multiple weightings based on groups of disability category, supplemented by reading/math and writing need within the category groups, to actual student counts.

In addition to the short-term investments, the cost study found that an increase to the ongoing funding for students with disabilities of $74 million per year is needed in order to ensure ongoing student growth for each student with an IEP. In the context of student growth, that means that every student with an IEP is achieving average annual growth for each year of instruction. Thus, this maintenance of average annual growth is the minimum standard for ongoing funds. These funds are for special education and related services specifically and will likely be counted toward maintenance of effort at both the local and state levels. As shown in Exhibit 60, the ongoing funds will apply equally each year, an annual increased investment of $74 million.

Exhibit 60. Amounts of Ongoing Investment, by Year

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Ongoing investment	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M	$75.4M

The amounts of the total, short-term, and ongoing investments recommended for the next 10 years compared with the amount invested in 2017–18 is presented in Exhibit 61.

Exhibit 61. Total Amounts of Increased Investments Compared to Current Investment

Total Short-term and Ongoing Increases Compared With Current Spending for Special Education	Current (2017–18)	Ongoing Increase per Year	Annual % Diff. with Ongoing Increase per Year	Average Short-term Increase per Year	Annual % Diff. with Short-term Increase per Year
Estimated state spending and local contribution ($ in millions)	$1,471.2	$75.4	5.1%	$218.9	14.9%
Per-pupil cost estimate ($)	$14,356	$775	5.1%	$2,252	14.9%

Note: Dollar values are in June 2019 terms. Adjusted for inflation to 2019 dollars use the Bureau of Labor Statistics cost price index (CPI) calculations over the period July 2018 to July 2019. These figures would need to be further adjusted for inflation over the next 10 years.
Source: Authors' calculations based on cost function model analysis

Consistent with the conclusions above, the recommended formula uses actual student counts to calculate the allocation of state funds to be provided to each LSS. The recommended grouping of disability categories by cost paired with the assessment of need within disability is a statistically significant model for increasing academic and functional outcomes for students with disabilities if additional funds are used to support evidence-based practices including high-quality general education instruction.

Exhibit 62. Proposed Weights to Be Used in Maryland's Funding Formula For Students with Disabilities

Proposed Weight Displayed by Summary Disability Category Including Need Factor	**Weight**
Highest Cost (Orthopedic Impairment, Traumatic Brain Injury)	2.8504
High Cost	1.4846

Proposed Weight Displayed by Summary Disability Category Including Need Factor	Weight
(Emotional Disability, Hearing Impairment/Deaf/Deaf-Blind)	
Medium Cost (Autism, Developmental Delay, Intellectual Disability, Speech or Language Impairment)	1.2926
Low Cost (Specific Learning Disability, Other Health Impairment, Visual Impairment, Multiple Disabilities)	1.1426

The construction of these weights, as previously discussed, is derived from statistical modeling that assesses various characteristics of the current composition of students with disabilities including: (1) proportions of students in grouped disability categories; (2) proportionate student academic needs in the areas of reading, math, and writing; and (3) the concentrations of students with disabilities at the school level. The proportions of need are based on the results of the cost function analysis that drew data from the past two years for all Maryland students with disabilities. It is not necessary to conduct such analyses every year. Therefore, the researchers suggest that these weightings be put in place for at least the next five years, at which point the MSDE could conduct these analyses again and recalibrate the weightings as described in Conclusion 2.5.4.

Simulation of a revised funding formula for students with disabilities

This simulation demonstrates how the state would implement the recommendations in this section, taking a step-by-step process, beginning with the current fiscal year 2020 (FY20) assumptions (see Exhibit 63). This simulation uses Maryland's FY20 base funding amount of $7,244 per student to demonstrate how resources would be allocated using this formula. For the sake of this simulation, the count of students with disabilities is 100.

Exhibit 63. Step-by-Step Instructions to Simulate Proposed Funding Formula for Students With Disabilities

Step	Calculation or Value	Notes
1. Identify base funding for the upcoming fiscal year.	$7,244 per student	FY20 base funding
2. Identify actual count of students with disabilities.	100 students	Actual count figures are from prior year October 30 U.S. Census count.
3. Determine the disability category for each of the students identified in step 2.	2 students in highest cost; 0 students in high cost; 49 students in medium cost; 49 students in low cost	Actual count figures also identify disability category for the student.

Step	Calculation or Value	Notes
4. Multiply base funding by category weight by count of students in that category. Repeat for each of the four disability categories.	(Base funding x disability category weight) x count of students in disability category = Sum of funding for that disability category	This step would be repeated for each disability category then summed to a total.
5. Sum the total from all four calculations to determine the total allocation to the LSS.	Very high cost = $20,648 x 2 = $41,296 High cost = $10,754 x 0 = $0 Medium cost = $9,363 x 49 = $458,787 Low cost = $8,276 x 49 = 405,524 **Total = $905,607**	

Source: Authors' calculations based on cost function model analysis

For the current and increased ongoing investments in special education, as recommended in under Conclusion 1.1.3, the MSDE should develop more rigorous mechanisms for evaluating fidelity of implementation of evidence-based practices. The MSDE should be prepared for this to elicit negative feedback from LSS leadership, who are currently provided significant autonomy on implementation of the IEP process and the provision of instruction across general and special education. Accountability and guidance must be provided collaboratively from MSDE special education and general education leadership. The state's special education Strategic Plan provides a road map of clear linkages from the state to LSS leadership, yet there is a lack of clarity around how resource allocation patterns occur to support schools in their implementation of support for students with disabilities. Further, the cost function analysis shows a clear misalignment of the use of existing resources to achieve the desired outcomes for students with disabilities.

The study did not review the MSDE's processes and procedures for fiscal monitoring and recommends the state revisit those procedures to better evaluate research allocation patterns. This monitoring, which should be connected to programmatic monitoring, is most effective when driven by and differentiated based on a risk assessment on multiple indicators including outcomes indicators that indicate additional monitoring and support when an LSS is not improving the academic achievement and functional outcomes for students with disabilities.

Recommendation 2.6.3. Apply equivalent projected cost increase for students with disabilities in PAs

As discussed in Section 2.1, the structure of the other public agencies prevents appropriate comparison with LSSs. However, the statistical modeling does enable an extension of the cost estimates from the LSS to the cost estimates based on the disability category and student need profile. Exhibit 64 presents the estimated increases for each public agency for whom budget information was made available to the researchers. The recommended adjustment will be made based on the proportion of students who are students with disabilities.

Exhibit 64. Recommended Increases for Maryland Public Agencies Based on FY2018 Information

Public Agency	Current 2017–18 ($)	Projected Increase ($)	Total Projected Amount ($)
School for the Blind	$23,018,459	$1,838,627	$24,857,086
School for the Deaf	$31,000,000	$4,997,473	$35,997,473
SEED School	$5,000,000	$240,000	$5,240,000

Source: Authors' calculations based on cost function model analysis

Recommendation 2.6.4. Provide additional accountability and guidance for local systems to effectively align resources with local students' needs, prioritize a small number of foundational, high-impact practices, and implement evidence-based practices with fidelity.

Fiscal Accountability

The MSDE has structures in place to ensure accountability for funds currently allocated for special education. Fiscal monitoring is a part of the differentiated framework discussed in the introduction to this report (see Introduction, Exhibit 1). However, as noted in Section 2.1, the state does not have a mechanism for requiring LSSs to report the actual amount of state-appropriated funds that are budgeted and expended for the education of students with disabilities. The researchers reinforce the recommendation that the MSDE modify its annual financial reporting requirements to separately report on state and local revenues for special education and how they are budgeted and spent. This will enable the state to more clearly track and study its investment in special education.

Programmatic Accountability

The outcomes of closing the achievement and graduation gaps predicted by the cost function exercises will be realized only if the short-term and ongoing investments are effectively used to implement evidence-based practices. Equally important to tracking and accounting for the appropriate use of state investments, the researchers recommend increasing programmatic accountability and guidance for local systems to effectively align resources with local students' needs and implement evidence-based practices with fidelity.

Use of short-term investments

The intention of the short-term investment funds is to improve academic achievement of students with disabilities in a school to the same rate of achievement as all students. Thereby these funds would be used to support the academic progress of students with disabilities beyond the requirements of a Free and Appropriate Public Education (FAPE). This will only be accomplished through general education

teachers' shared ownership for their achievement and by ensuring that children have early, consistent access to high quality first, or core, instruction.

The MSDE should require that the short-term investments be used only to provide evidence-based practices to students who are identified as students with disabilities or whom the LSS has identified as being at risk for being identified as a student with a disability. The MSDE should create a planning and evaluation process to review the plans for use of short-term investments and to review regular data from progress monitoring to determine whether the investments are effective. This planning and evaluation process could be unique or could be part of the MSDE school improvement planning process. If the latter, the MSDE should expect additional supplemental strategies to be added to the plan. It would not be in line with the purpose of the funding to use it to provide interventions currently in place, but funds could be used to expand an intervention shown to be effective in increasing outcomes for the targeted group.

Given the narrow purpose of the short-term investment, the MSDE should limit the use of funds only to interventions, activities, or strategies that are evidence based. The MSDE could adopt the definition of "evidence based" as established in the Elementary and Secondary Education Act (ESEA). Section 8101(21)(A) of the ESEA defines an evidence-based intervention as being supported by strong evidence, moderate evidence, promising evidence, or evidence that demonstrates a rationale (see below). Some ESEA programs encourage the use of evidence-based interventions supported by evidence that meets one of the lower levels, whereas others, including several competitive grant programs and Title I, Section 1003 funds, require the use of the higher levels of evidence to support evidence-based interventions. The following definitions should inform guidance on the use of funds:

"…the term 'evidence-based,' when used with respect to a State, local educational agency, or school activity, means an activity, strategy, or intervention that –

> *(i) demonstrates a statistically significant effect on improving student outcomes or other relevant outcomes based on –*
>
> > *(I) strong evidence from at least one well-designed and well-implemented experimental study;*
> >
> > *(II) moderate evidence from at least one well-designed and well-implemented quasi-experimental study; or*
> >
> > *(III) promising evidence from at least one well-designed and well-implemented correlational study with statistical controls for selection bias; or*
>
> *(ii) (I) demonstrates a rationale based on high-quality research findings or positive evaluation that such activity, strategy, or intervention is likely to improve student outcomes or other relevant outcomes; and (II) includes ongoing efforts to examine the effects of such activity, strategy, or intervention.*

Further guidance on selecting and evaluating evidence-based practices is provided from the U.S. Department of Education in *Non-Regulatory Guidance: Using Evidence to Strengthen Education Investments* (2016).

Focus of short-term investments

Based on the profile of Maryland students with disabilities and the literature review described in Sections 1.2 and 1.3 of this report, the researchers recommend focusing the short-term investment in three areas. However, as recommended in Conclusion 1.1.1, the state should consider differentiating the short-term investment amounts based on LSS results and progress data. As with other discretionary funds, while moving away from a formula-based distribution of funds may mean that every LSS/PA may not receive a proportionate share of funds for each of the imperatives, LSS/PAs that demonstrate readiness and a need for more intensive support may be able to make better progress if they receive additional funds under a prioritized, differentiated system approach.

As noted above, LSS general education and special education leadership should lead the implementation of these activities, in coordination with other school improvement strategies:

- *Increasing access to and the quality of first, or core, general education instruction at all grade levels*

  As general education teachers are increasingly more involved in educating students disabilities, their professional development is essential.

- *Increasing the use of differentiated instruction and responsive intervention frameworks work to improve student learning and prevent over-reliance on special education as a system of support for low-performing students*

  Research suggests that differentiated instruction and responsive intervention frameworks work to improve student learning and prevent over-reliance on special education as a system of support for low-performing students. A meta-analysis of large-scale models of RtI found that RtI implementation leads to improved systemic and student outcomes and prevents the overidentification of students as eligible for special education (Burns, Appleton, & Stehouwer, 2005). A quasi-experimental study of 24 teachers and 479 fourth graders of mixed ability found that students made more progress on reading and literacy when differentiated instruction methods were systematically employed, even when controlling for socioeconomic status (Valiandes, 2015). A research review of 13 studies evaluating the impact of Universal Design for Learning (UDL) suggests that UDL-based instruction has the potential to help teachers meet the academic needs of all students and to support the achievement of students with varied needs, but effect sizes ranged from small to large, with efficacy dependent upon fidelity of implementation (Ok, Rao, Bryant, & McDougall, 2016).

- *Intervening in preschool and early elementary intervention to earlier address the need for special education services*

  As recorded in the Strategic Plan, “intervening early with family-centered, evidence-based practices can change a child’s developmental trajectory and improve outcomes for children and families” (MSDE, 2016, p. 14).

The Strategic Plan (MSDE, 2016, p.14) provides an excellent summary of the literature around early intervention and the importance of a strong early intervention program, stating the following:

- We know intentionally engaging families as equal and informed partners supports families to know their rights, effectively communicate their child's needs, and help their child develop and learn.
- We know children learn best through natural learning opportunities in everyday routines and activities in home, community, and early childhood settings with typical peers.
- We know strong alignment across early childhood programs and systems creates seamless transitions to LSS/PAs. Ultimately, we know early childhood intervention and education works. The earlier services and supports are provided to a child and family, the greater the opportunity to close gaps.

Evaluation of short-term investments

The researchers recommend that Maryland assigns LSS leadership, composed of general education and special education leaders, with the responsibility to (1) ensure the funds are used for the intended purpose, and to (2) develop interim measures to demonstrate to the state that the strategies funded with the short-term investments will lead to improved academic achievement and functional outcomes for students with disabilities. Interim measures for evaluating effectiveness should be developed as part of the planning process.

Recommendation 2.6.5: As short-term investments lead to increased academic achievement for students with disabilities, the researchers predict that some students will exit special education and the number of students with disabilities may decrease.

Because of the high needs of current special education students across grades, the state should not anticipate a reduction in the number of students for a number of years. The state should prepare to adjust the formula based on the transition of students out of special education and consider the supports for those students who may need extra help to maintain higher achievement without special education services.

However, it is important for the state to understand that placing a ceiling or cap on the number of expected students with disabilities is not allowed as IDEA is an individual entitlement provided to every child who is an eligible child with a disability. Given the nature of many disabilities, it may be that, while students with disabilities are able to better achieve proficiency, they will remain in need of the accommodations and supports provided through special education.

Recommendation 2.6.6. As data become available on the effectiveness of the planned investments recommended by the Kirwan Commission, the state should consider whether those investments meet the student needs identified in this study and whether the recommended investments from this study may be partially offset by the investments instigated by the Kirwan Commission.

The scope of this study consisted of a comprehensive study of the IEP process in the state of Maryland, reports on the current spending for special education, and recommendations to adequately fund special education to ultimately improve academic achievement and functional outcomes for students with disabilities in Maryland based upon the state's current educational system. This study's recommendations were derived based on Maryland's current governance, finance, and education policy structures. As such, the report's recommendations assume the continuance of this system including the additional short-term and ongoing investments described in sections 2.6.1 and 2.6.2 above.

While the scope did not include predicting the impact and interaction between the study's recommendations and a redesigned education system based on the Kirwan Commission, the researchers recognize the ongoing and dynamic nature of improving state and local education systems and that information from this study would be beneficial to state decisionmakers as they consider implementing both this report's recommendations and the recommendations made by the Kirwan Commission.

Kirwan Commission recommendations

Since 2016, the Kirwan Commission has worked to reimagine the education system in Maryland and how it could be redesigned to meet world class standards. In January of 2019 the Kirwan Commission released its preliminary report[27] that, if fully implemented, should dramatically change the overall structure of the state's education system over the next 10 years. The changes recommended by the Kirwan Commission include policy changes and recommended funding increases in five areas:

- **Policy Area 1**: Early Childhood Education including providing prekindergarten for 80 percent of all four year olds and high needs three year olds;
- **Policy Area 2**: High Quality and Diverse Teachers and Leaders which looks to revamp teacher preparation in the state, implement a career ladder for teachers, provide additional planning time for all teachers, pay teachers more competitively, and provide training for all school leaders in the state;
- **Policy Area 3**: College and Career Readiness Pathways which provides pathways for all Maryland students to be college and career ready with an emphasis on career and technical education and expanded opportunities for students CCR ready in 10th grade;
- **Policy Area 4**: More resources to Ensure All Students are Successful which includes targeted resources for English language learners (EL), Compensatory, Special Education, and students in

[27] http://dls.maryland.gov/pubs/prod/NoPblTabMtg/CmsnInnovEduc/2019-Interim-Report-of-the-Commission.pdf

schools with high concentrations of poverty. This policy area includes a placeholder funding weight for special education students calculated on the current special education spending in the state.

- **Policy Area 5**: Governance and Accountability includes the establishment of an Independent Oversight Board to monitor the implementation of the Kirwan recommendations.

The Kirwan Commission believes that the implementation of these policy changes as well as existing and additional resources aligned with these policies will fundamentally change the outcomes for students in Maryland including students with disabilities. While this study could not fully evaluate the impact of the changes ushered in by the Kirwan Commission recommendations and those recommendations contained within this report, the researchers believe there are a number of areas of potential overlap in the goals of the recommended investments presented in this report and the goals of the investments proposed by the Kirwan Commission. Without data on the impacts of implementation of their recommendations, it is not possible to fully estimate the levels of resource overlap in all cases, but this section discusses potential overlap and areas the state should study to ensure investments are not duplicative.

Overlapping purposes and strategies

This report recommends two increased investments based on the review of the IEP process and adequate funding for students with disabilities. First, an increase to Maryland's ongoing special education funding to ensure that each student with a disability makes reasonable progress, in light of their individual circumstances, each year based on their IEP. Second, an increase by way of short-term funding intended to close the gap between students with disabilities and their general education peers as measured by statewide assessments, for each of the approximately 97,000 students with disabilities in Maryland currently receiving special education and related services.

The Kirwan Commission's recommendation for increasing the ongoing investment in special education (Policy Area 4) was to use a placeholder weight until the conclusion of this study. The researchers believe that the recommended increase in ongoing funding and the weights for distributing the state investment for special education are accurate and valid, based on the current status of the Maryland education system. The state should implement the recommended investment in ongoing funding until data are available demonstrating the Kirwan Commission recommendations have resulted in fewer students identified with a disability or that the needs of students with disabilities have changed, which the Kirwan Commission's report states could take multiple years.[28]

The most likely overlap between the recommendations in this report and the Kirwan Commission recommendations are between the short-term investments to close the gap for students with disabilities (Recommendation 2.6.1) and funding for Transitional Supplement Instruction (TSI) designed to provide resources for students not currently attaining proficiency on state exams. TSI is designed to provide some additional funding to the system now and then be phased out by FY 26 as other

[28] Maryland Commission on Innovation & Excellence in Education: Interim Report. January 2019. Page 87.

components of the Kirwan Commission recommendations are implemented. This designated funding is intended to address the needs of struggling learners in grades K-3.

While the researchers agree that these purposes are similar, the Kirwan Commission recommendations focus very heavily on the early grades while this study's recommendations are based on improving outcomes for every current student with a disability in Maryland, through grade 12. It is likely that the TSI funding and the short-term funding identified in this study include funds intended at bringing some of the same students to proficiency, but only a subset of those students. This is primarily because the adequacy study is building cost estimates on those students that are in grades assessed annually. The contribution of PreK and early grades is crucial because it ensures that as the state improves student proficiency each year, it's bringing students in tested grades to higher levels of proficiency over time, thereby offsetting the need for some of the one-time, supplemental funds recommended by this study. However, the system, as recognized by the Kirwan Commission, needs time to recalibrate and adjust practices to achieve such high outcomes. Below are some initial, preliminary analytical criteria that should be used by the researchers and Legislative staff to estimate more fully the overlap in costs identified by this study and those outlined in the Kirwan Commission's final recommendations to the Legislature.

Potential adjustments to the short-term and ongoing recommendations

The funds provided for TSI under the Kirwan Commission recommendations are intended to increase the academic skills of K-3 students that would allow students once they reach the 3rd grade to achieve proficiency on the statewide literacy assessment. Exhibit 65 below displays the percent of students in the 3rd grade that were below proficiency and the number of students with disabilities that were below proficiency in the 2017-18 school year.

Exhibit 65. Number and Percent of 3rd Grade Students Below Proficiency on Statewide Assessment, 2017-18

English Language Arts (ELA)	Below Proficiency (#)	Total Students Below Proficiency (%)
All Students	41,662	83%
Students with Disabilities	7,016	17%
Math		
All Students	39,457	83%
Students with Disabilities	6,714	17%

Source: MSDE student assessment data, 2017-18.

In short, 3rd grade students with disabilities currently make up approximately 17% of the population of total students that are not proficiency on the ELA and math assessments in the 2017-18 school year. The

researchers anticipate this means that some, but not all, of the dollars allocated for TSI purposes would be directed to students with disabilities under the definitions in the report.

Initial analysis on overlap of study short-term increase recommendations and Kirwan Commission

Currently, the Kirwan Commission is recommending that approximately $23 million be invested for TSI for the FY 21 school year, then $33 million for FY 22, and $46 million for FY 23 through FY 26.

This study's recommendations for short-term increases presume an approximate $22 million investment per grade between Kindergarten and 9th grade. The intention of the short-term investment funds is to improve academic achievement of students with disabilities in a school to the same rate of achievement as all students. Thereby these funds would be used to support the academic progress of students with disabilities beyond the requirements of a Free and Appropriate Public Education (FAPE).

The MSDE should require that the short-term investments be used only to provide evidence-based practices to students who are identified as students with disabilities or whom the LSS has identified as being at risk for being identified as a student with a disability.

While further estimation is required, initial estimates would show that an average overlap in cost of approximately $45 million per year. This figure is derived by analyzing the portion of funding dedicated by grade from the short-term increase (approximately $22 million per grade) and the amount dedicated in the Kirwan Commission to early intervention. In implementation this amount of overlap would be much less in the FY 21 year as compared to the FY 24 year. Further estimation and reconciliation are necessary.

Initial analysis on overlap of ongoing increase recommendations and Kirwan Commission

As it concerns the ongoing funding recommendation in this study and the placeholder that the Kirwan Commission placed in its recommendations for support to students with disabilities the researchers believe that there is also some overlap. This study recommends a $75.9 million increase per year ongoing. The Kirwan Commission has recommended a $65.5 million increase in FY 21 which is equivalent to FY 20. This figure would rise to $106.5 million by FY 24. The researchers were unable to reconcile several important factors for consideration such as the calculation of base cost, assumptions of student count, and presumptions about inflation. Such additional investigation will be necessary to identify the exact figure of overlap; however, the researchers do believe that there is some redundancy in cost.

In summary, there is some overlap between this study and the Kirwan Commission recommendations. If the General Assembly move forward with funding recommendations from the Kirwan Commission, then adjustments will need to be made to those recommendations to reconcile this study's estimates and those currently in the Kirwan Commission's report.

Future studies needed

This study evaluated Maryland's current governance, finance, and education policy structures for students with disabilities. While each of the Kirwan Commission policy areas described above could reasonably improve outcomes for students with disabilities, the researchers caution against delaying the recommendations made in this report based on projected outcomes from those recommendations.

In order to study the effect of both sets of recommendations on academic achievement and functional outcomes for students with disabilities, the state should ensure that both the short-term investments recommended in this report and the investments made based on the Kirwan Commission recommendations are carefully tracked and that an accountability mechanism is put in place to ensure that the funds are used for their intended purposes.

The Oversight Board will monitor implementation of the Kirwan Committee recommendations. It would be valuable for the results of this study to be analyzed against the information gained by the Oversight Board to see if adjustments could be made to these recommendations based on gains seen in the overall system over time.

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Appendices

Appendix 1. Data challenges and opportunities for improvement

With any study involving large administrative data sets, there are challenges with respect to data preparation. In general, the researchers made every effort to minimize the impact of any issues that arose while maximizing the data that could be included in the analysis. And with few exceptions the data provided by MSDE and other LSSs in Maryland was extremely clean and internally consistent. Most challenges related to in consistency across data sources rather than issues within any particular source.

There are two particular challenges discussed below in more detail that had a more significant impact on our analysis. A few key identified opportunities for improvement with respect to the available data are outlined as well.

Online IEP Data Misalignment

The issue of misalignment between IEP data accessed through the Maryland Online IEP system and data provided through district-specific online IEP systems is described in an earlier section. While there was some amount of inconsistency across all sources of IEP data, there was a particularly significant difference between Baltimore County and Montgomery County (prior to joining the MOIEP in 2017-18) and the other LSSs. Primarily, these two LSSs provided IEP data based on a snapshot of information gathered on October 1. This is in contrast to the other LSSs which based their collection on the end of the school year period, from July to June.

To mitigate this particular misalignment several steps were taken. First, to bring the misaligned LSSs in closer alignment with end of year data, the school year was assumed to be the school year prior to the collection date. For example, if the data were collected on October 1, 2017, then the school year was assumed to be 2016-17. This has the effect of capturing the year in which implementation of the IEP predominantly took place.

Second, a consistent, external source was identified, the MSDE attendance files. These data reflect student's in membership and identified for an IEP as of the end of the school year and was chosen as the common directory for all analyses using IEP data. The MSDE attendance data source was selected in part because it was recommended as a source for indicators of special service populations by MSDE over September 30 counts.

Using the MSDE attendance files as a common student directory, student data in the IEP files were matched to it at the student/year level. IEP data for any student identified for an IEP in the attendance files in a given year was preserved for analysis. Students with IEP data not found in the attendance file or not identified for an IEP in the attendance file were dropped. The only exception to this was IEP data for students served in a Public Agency. These services locations are not reported in the attendance files and thus were retained as a totally distinct group.

There was a subset of students (about 4.5%) identified for an IEP in the attendance files but not found in the IEP data in a given school year. About half of these students were in the misaligned LSSs Baltimore County and Montgomery County (pre-2017-18). The likely cause being that these students were in membership in these LSSs as of the end of the school year but no longer in these LSSs (or identified for an IEP) as of October 1. Thus, to capture IEP data for just these students, their prior year collection was used. For example, for a student in this circumstance in 2016-17 IEP data collected on October 1, 2016 was used, as opposed to October 1, 2017.

After making this change, the subset of students in this circumstance (i.e. identified for an IEP in the attendance file but not found in IEP data) was reduced to about 2% of students. One reason for this is that Anne Arundel County's local system does not report data for pre-kindergarten students and so IEP data for these students are not available. Aside from this, the root causes are not known. Several things are possibly contributing to this. First, it is possible that the scope of students in the IEP file is slightly misaligned with the scope of the attendance file in ways that are unknown to us. Another possibility is that a student was identified for an IEP very near the end of the year, but their IEP was not actually finalized until the next school year, resulting in this gap. Ultimately, whatever the reason(s), this mismatch represents a limitation in our ability to access IEP data for all IEP students in the attendance files. A review of the location and characteristics of these students reveals no evidence of systematic bias resulting from the missing information.

Inconsistently Defined Scope

In addition to misalignment within online IEP data sources, the researchers found that other sources of data provided similar information but with inconsistency in the scope of the collection. In other words, one data source would identify a particular measure within a different context than another, though this difference would not be apparent when accessing and reviewing the raw data.

The most salient example of this was found when comparing IDEA Section 618 Personnel data to the MSDE Staff data, both provided through the public report card files and through an individual-level salary file. Our understanding was that the Section 618 data could provide the subset of staff serving students with disabilities and when compared to the staff file, would allow us to calculate the percentage of staff time allocated to students with disabilities by particular position categories (e.g. School Psychologist, Nurse, etc.).

However, when compared to the MSDE Staff files it became clear that the FTEs in the Section 618 data were often greater than the overall staff FTEs in the MSDE file. After discussion with MSDE, it became clear that the Section 618 file included staff not reported in the MSDE file and, importantly, not distinguished in the Section 618 data. These additional staff are nonpublic staff serving students with disabilities within the district geographic area. Since the staff file could not provide the FTEs allocated to students with disabilities, and the Section 618 data included more staff than found in the staff file, it was impossible to use these sources in combination to calculate the desired percentage of time allocated to students with disabilities for all positions.

Opportunities for Improvement

In general, the challenges encountered in the preparation of state data for analysis relate to inconsistencies between data sources, whether within a common type of data (e.g. online IEP data) or across sources reporting related but distinct information (e.g. MSDE staff data and Section 618 data). Given this, the researchers would identify, in general, policies that bring state data into greater alignment as an avenue by which to improve state education data overall. Some particular suggested actions are provided below.

Establish Common Procedure for Reporting IEP Data by School Year

This would likely be made easier if all LSSs adopted the state online IEP system, the MOIEP. A common data system allows for efficient adoption of consistent business rules and collection procedures. Moreover, it would facilitate the implementation of statewide analyses that go beyond the commonly reported statewide data and require collecting and synchronizing online IEP data from all LSSs, as this study did.

However, even if multiple online IEP data systems remain, the state may consider providing guidance with respect to reporting IEP data by school year. Comparing statewide data over time is a cornerstone of educational research and data-driven decision making. This type of guidance would facilitate this type of analysis.

Reconcile the State Staff Data to Improve Transparency with Respect to Staff Serving Students with Disabilities

The ability for a stakeholder to determine accurately allocation of staff in specific position categories in a district relative to allocations to general education services is of great value. This might be accomplished by at a minimum identifying those FTEs associated with nonpublic settings within a district, so as to make the Section 618 data comparable to other state staff data.

However, there may be an opportunity to combine data sources and create more comprehensive reports that show the full complexity of staff serving students with disabilities.

Appendix 2. Supplemental Data Tables

Exhibit 2-1. Students with Disabilities as Percent of September 30 Enrollment: Five-year Trend – Grades K-12

	2016-17	2013-14			2017-18		
School System	Urban-centric Locale	All Students	Special Education	% of All Students	All Students	Special Education	% of All Students
Total State		***835,162***	***92,147***	***11.0%***	***862,333***	***97,233***	***11.3%***
Allegany	13-City: Small	8,299	1,252	15.1%	8,102	1,265	15.6%
Anne Arundel	21-Suburb: Large	75,964	6,703	8.8%	80,374	7,389	9.2%
Baltimore City	11-City: Large	78,543	12,741	16.2%	74,495	11,854	15.9%
Baltimore County	21-Suburb: Large	105,054	11,998	11.4%	110,147	13,429	12.2%
Calvert	41-Rural: Fringe	15,809	1,262	8.0%	15,438	1,319	8.5%
Caroline	42-Rural: Distant	5,233	532	10.2%	5,461	526	9.6%
Carroll	23-Suburb: Small	25,886	2,758	10.7%	24,945	2,703	10.8%
Cecil	41-Rural: Fringe	14,932	2,060	13.8%	14,628	2,149	14.7%
Charles	22-Suburb: Mid-size	25,554	2,327	9.1%	26,360	2,712	10.3%
Dorchester	42-Rural: Distant	4,507	435	9.7%	4,491	418	9.3%
Frederick	22-Suburb: Mid-size	39,588	3,960	10.0%	40,971	4,266	10.4%
Garrett	32-Town: Distant	3,739	393	10.5%	3,642	335	9.2%
Harford	22-Suburb: Mid-size	36,902	4,455	12.1%	36,780	4,555	12.4%
Howard	21-Suburb: Large	51,810	4,155	8.0%	55,731	4,880	8.8%
Kent	42-Rural: Distant	1,995	247	12.4%	1,831	269	14.7%
Montgomery	21-Suburb: Large	148,088	15,793	10.7%	157,424	17,500	11.1%
Prince George's	21-Suburb: Large	119,643	13,359	11.2%	127,110	13,751	10.8%
Queen Anne's	21-Suburb: Large	7,458	894	12.0%	7,517	770	10.2%
Saint Mary's	41-Rural: Fringe	16,881	1,552	9.2%	17,051	1,680	9.9%

	2016-17	2013-14			2017-18		
School System	Urban-centric Locale	All Students	Special Education	% of All Students	All Students	Special Education	% of All Students
The SEED School	11-City: Large	373	38	10.2%	362	52	14.4%
Somerset	32-Town: Distant	2,688	438	16.3%	2,662	421	15.8%
Talbot	32-Town: Distant	4,319	399	9.2%	4,431	430	9.7%
Washington	22-Suburb: Mid-size	21,878	2,003	9.2%	21,790	2,147	9.9%
Wicomico	13-City: Small	13,785	1,663	12.1%	14,243	1,683	11.8%
Worcester	32-Town: Distant	6,234	730	11.7%	6,347	730	11.5%

Source: Maryland State Department of Education. End-of-Year Attendance Files. SYs 2014-2018; Notes: (1) Figures represent totals for local school systems only. This does not include public agencies. (2) Special education numbers include: Eligibility 1, defined as a student with a disability served in a public school or placed in a nonpublic school by the public agency to receive FAPE, and (2) Eligibility 2, defined as a parentally-placed private school student with a disability receiving special education and/or related services through a service plan from the public agency.

Exhibit 2-2. Comparison of overall spending per student and spending per special education student, fiscal year 2018

School System	Expenditure Per Student	Expenditure Per Special Ed Student	Special Ed Students	Total Federal Revenue	Fed Spend Per Std	Total State Revenue	State Spend Per Std	Total Local Contribution	Local Contribute Per Std
All Public Schools	***$14,256***	***$17,043***	***97,233***	***$195,120,107***	***$2,007***	***$278,660,064***	***$2,866***	***$1,183,344,976***	***$12,170***
Allegany	$13,623	$14,143	1,265	$2,414,026	$1,908	$5,375,201	$4,249	$10,101,197	$7,985
Anne Arundel	$13,229	$17,868	7,389	$18,222,188	$2,466	$17,444,131	$2,361	$96,363,402	$13,041
Baltimore City	$15,215	$16,114	11,854	$23,244,790	$1,961	$47,620,423	$4,017	$120,147,078	$10,136
Baltimore County	$13,618	$15,542	13,429	$26,062,188	$1,941	$35,512,231	$2,644	$147,134,665	$10,956
Calvert	$13,619	$20,242	1,319	$3,713,899	$2,816	$3,775,706	$2,863	$19,210,196	$14,564
Caroline	$12,930	$14,239	526	$1,401,322	$2,664	$2,487,264	$4,729	$3,601,054	$6,846
Carroll	$13,484	$15,634	2,703	$5,744,046	$2,125	$7,161,415	$ 2,649	$29,353,472	$10,860
Cecil	$13,101	$12,720	2,149	$3,903,678	$1,817	$7,199,828	$3,350	$16,231,202	$7,553

School System	Expenditure Per Student	Expenditure Per Special Ed Student	Special Ed Students	Total Federal Revenue	Fed Spend Per Std	Total State Revenue	State Spend Per Std	Total Local Contribution	Local Contribute Per Std
Charles	$13,735	$14,450	2,712	$5,381,146	$1,984	$9,137,138	$3,369	$24,670,598	$9,097
Dorchester	$14,261	$15,082	418	$1,175,477	$2,812	$902,919	$2,160	$4,226,063	$10,110
Frederick	$12,593	$13,801	4,266	$7,826,672	$1,835	$10,884,789	$2,552	$40,163,743	$9,415
Garrett	$14,903	$12,685	335	$1,043,531	$3,115	$830,080	$2,478	$2,375,833	$7,092
Harford	$12,770	$12,860	4,555	$8,588,987	$1,886	$10,473,546	$2,299	$39,512,684	$8,675
Howard	$15,562	$24,925	4,880	$9,801,585	$2,009	$9,959,000	$2,041	$101,872,755	$20,876
Kent	$15,015	$13,251	269	$537,992	$2,000	$240,026	$892	$2,786,473	$10,359
Montgomery	$15,605	$19,097	17,500	$31,337,907	$1,791	$38,947,354	$2,226	$263,909,571	$15,081
Prince George's	$14,613	$20,022	13,751	$27,493,014	$1,999	$43,838,999	$3,188	$203,985,186	$14,834
Queen Anne's	$12,821	$12,916	770	$1,714,481	$2,227	$1,832,402	$2,380	$6,398,196	$8,309
Somerset	$15,427	$10,792	421	$832,515	$1,977	$1,733,014	$4,116	$1,977,935	$4,698
Saint Mary's	$13,027	$13,242	1,680	$3,549,927	$2,113	$5,199,768	$3,095	$13,497,118	$8,034
Talbot	$12,579	$12,524	430	$1,079,646	$2,511	$935,915	$2,177	$3,369,731	$7,837
Washington	$12,748	$12,891	2,147	$5,155,981	$2,401	$7,729,274	$3,600	$14,790,687	$6,889
Wicomico	$13,358	$11,747	1,683	$3,183,474	$1,892	$7,698,549	$4,574	$8,887,814	$5,281
Worcester	$17,330	$16,755	730	$1,711,634	$2,345	$1,741,093	$2,385	$8,778,325	$12,025

Source: Maryland State Department of Education. End-of-Year Attendance Files. SY 2014-2018; Maryland State Department of Education. Annual Financial Report. FY 2014-2018

Exhibit 2-3. LSS spending per special education student by type of expenditure, 2018

School District	Salaries and Wages	Transfers	Contract Services	Supplies and Materials	Other Charges	Property	Grand Total
Allegany	$8,991	$3,169	$1,838	$56	$87	$2	$14,143
Anne Arundel	$13,547	$3,214	$765	$248	$91	$3	$17,868
Baltimore City	$10,998	$2,434	$2,464	$201	$14	$3	$16,114

School District	Salaries and Wages	Transfers	Contract Services	Supplies and Materials	Other Charges	Property	Grand Total
Baltimore County	$11,386	$3,507	$348	$138	$151	$12	$15,542
Calvert	$17,967	$1,384	$533	$114	$179	$65	$20,242
Caroline	$10,680	$2,865	$332	$178	$146	$37	$14,239
Carroll	$11,692	$2,499	$1,105	$220	$110	$9	$15,634
Cecil	$10,765	$918	$850	$118	$41	$28	$12,720
Charles	$11,608	$1,215	$1,498	$71	$58	$-	$14,450
Dorchester	$10,225	$2,106	$2,211	$342	$199	$-	$15,082
Frederick	$10,875	$2,277	$515	$95	$38	$-	$13,801
Garrett	$10,097	$659	$1,482	$165	$269	$13	$12,685
Harford	$9,717	$2,615	$375	$81	$41	$31	$12,860
Howard	$20,151	$2,975	$1,538	$177	$80	$4	$24,925
Kent	$10,226	$1,581	$1,119	$204	$59	$63	$13,251
Montgomery	$16,078	$2,517	$264	$104	$82	$52	$19,097
Prince George's	$14,991	$4,142	$750	$80	$47	$13	$20,022
Queen Anne's	$10,858	$995	$691	$251	$117	$3	$12,916
Somerset	$9,726	$78	$688	$121	$91	$88	$10,792
St. Mary's	$10,446	$960	$1,499	$263	$74	$-	$13,242
Talbot	$8,976	$692	$1,404	$465	$927	$60	$12,524
Washington	$10,404	$1,878	$380	$155	$46	$27	$12,891
Wicomico	$11,139	$298	$145	$92	$74	$ -	$11,747
Worcester	$14,846	$251	$1,208	$219	$223	$7	$16,755
Grand Total	$13,195	$2,727	$880	$142	$81	$18	$17,043

Source: Maryland State Department of Education. End-of-Year Attendance Files. SY 2014-2018; Maryland State Department of Education. Annual Financial Report. FY 2014-2018.

Exhibit 2-4. LSS spending per special education student by type of expenditure, by Percentage of total spending, 2018

School District	Salaries and Wages	Transfers	Contract Services	Supplies and Materials	Other Charges	Property	Grand Total
Wicomico	94.8%	2.5%	1.2%	0.8%	0.6%	0.0%	100.0%
Somerset	90.1%	0.7%	6.4%	1.1%	0.8%	0.8%	100.0%
Calvert	88.8%	6.8%	2.6%	0.6%	0.9%	0.3%	100.0%
Worcester	88.6%	1.5%	7.2%	1.3%	1.3%	0.0%	100.0%
Cecil	84.6%	7.2%	6.7%	0.9%	0.3%	0.2%	100.0%
Montgomery	84.2%	13.2%	1.4%	0.5%	0.4%	0.3%	100.0%
Queen Anne's	84.1%	7.7%	5.4%	1.9%	0.9%	0.0%	100.0%
Howard	80.8%	11.9%	6.2%	0.7%	0.3%	0.0%	100.0%
Washington	80.7%	14.6%	2.9%	1.2%	0.4%	0.2%	100.0%
Charles	80.3%	8.4%	10.4%	0.5%	0.4%	0.0%	100.0%
Garrett	79.6%	5.2%	11.7%	1.3%	2.1%	0.1%	100.0%
Saint Mary's	78.9%	7.2%	11.3%	2.0%	0.6%	0.0%	100.0%
Frederick	78.8%	16.5%	3.7%	0.7%	0.3%	0.0%	100.0%
Kent	77.2%	11.9%	8.4%	1.5%	0.4%	0.5%	100.0%
Anne Arundel	75.8%	18.0%	4.3%	1.4%	0.5%	0.0%	100.0%
Harford	75.6%	20.3%	2.9%	0.6%	0.3%	0.2%	100.0%
Caroline	75.0%	20.1%	2.3%	1.2%	1.0%	0.3%	100.0%
Prince George's	74.9%	20.7%	3.7%	0.4%	0.2%	0.1%	100.0%
Carroll	74.8%	16.0%	7.1%	1.4%	0.7%	0.1%	100.0%
Baltimore County	73.3%	22.6%	2.2%	0.9%	1.0%	0.1%	100.0%
Talbot	71.7%	5.5%	11.2%	3.7%	7.4%	0.5%	100.0%
Baltimore City	68.3%	15.1%	15.3%	1.2%	0.1%	0.0%	100.0%
Dorchester	67.8%	14.0%	14.7%	2.3%	1.3%	0.0%	100.0%
Allegany	63.6%	22.4%	13.0%	0.4%	0.6%	0.0%	100.0%

School District	Salaries and Wages	Transfers	Contract Services	Supplies and Materials	Other Charges	Property	Grand Total
Grand Total	77.4%	16.0%	5.2%	0.8%	0.5%	0.1%	100.0%

Source: Maryland State Department of Education. End-of-Year Attendance Files. SY 2014-2018; Maryland State Department of Education. Annual Financial Report. FY 2014-2018.

Exhibit 2-5. Estimate of time students with disabilities spend in general education classrooms, by LSS, 2018

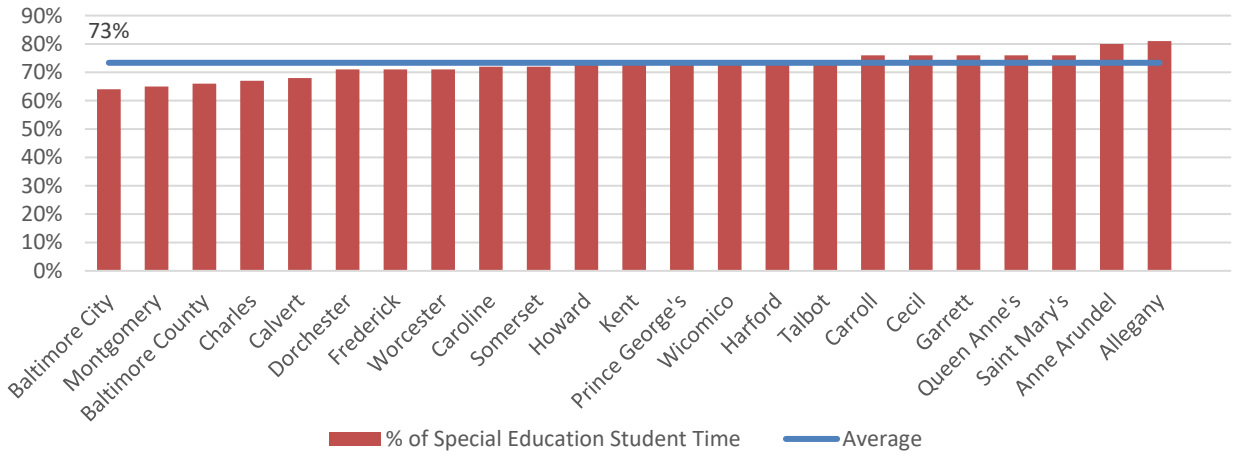
District	Total Salaries - Per-Pupil	Special Education Salaries Estimate #1 - Per-Pupil	Special Education Salaries Estimate #2 - Per-Pupil	% Difference Between Estimates	Special Education FTEs Estimate #1	Special Education FTEs Estimate #2	% of All GenEd Student Time	% of Special Education Student Time
Allegany	$7,750	$1,306	$1,853	42%	215.00	289.50	14%	81%
Anne Arundel	$7,387	$1,159	$1,458	26%	1645.60	2033.70	8%	80%
Baltimore City	$7,804	$1,669	$2,053	23%	1899.40	2330.70	10%	64%
Baltimore County	$7,583	$1,224	$1,561	28%	2359.50	2935.80	9%	66%
Calvert	$8,174	$1,437	$1,692	18%	406.80	462.40	7%	68%
Caroline	$7,598	$978	$1,294	32%	126.50	158.70	7%	72%
Carroll	$7,038	$980	$1,314	34%	487.10	631.60	11%	76%
Cecil	$8,286	$1,542	$2,045	33%	442.20	555.00	12%	76%
Charles	$7,562	$1,121	$1,422	27%	610.90	741.60	8%	67%
Dorchester	$8,057	$674	$965	43%	53.00	79.90	6%	71%
Frederick	$7,451	$1,070	$1,407	32%	1003.70	1217.20	9%	71%
Garrett	$7,045	$805	$1,090	35%	68.00	86.90	7%	76%
Harford	$7,057	$1,178	$1,538	31%	1075.80	1298.40	10%	74%
Howard	$9,806	$1,581	$1,966	24%	1567.30	1874.30	7%	73%
Kent	$7,394	$1,093	$1,549	42%	36.10	51.20	11%	73%
Montgomery	$9,376	$1,593	$2,003	26%	3738.00	4558.30	8%	65%
Prince George's	$8,274	$1,469	$1,795	22%	3235.60	3849.50	7%	73%

District	Total Salaries - Per-Pupil	Special Education Salaries Estimate #1 - Per-Pupil	Special Education Salaries Estimate #2 - Per-Pupil	% Difference Between Estimates	Special Education FTEs Estimate #1	Special Education FTEs Estimate #2	% of All GenEd Student Time	% of Special Education Student Time
Queen Anne's	$7,202	$1,007	$1,350	34%	149.50	190.50	8%	76%
Saint Mary's	$7,230	$953	$1,235	30%	320.70	397.50	7%	76%
Somerset	$9,789	$1,382	$1,915	39%	78.30	104.30	9%	72%
Talbot	$6,968	$852	$1,146	34%	77.60	100.30	9%	74%
Washington	$6,957	$935	$1,243	33%	437.60	549.50	8%	76%
Wicomico	$7,828	$1,134	$1,522	34%	414.30	513.70	9%	73%
Worcester	$9,842	$1,581	$2,039	29%	222.00	269.30	9%	71%

Source: Maryland State Department of Education. Staff Salary File. SY2014-2018; Maryland State Department of Education. Maryland Online Individualized Education Program (MOIEP) Data. SY2015 through 2019; Baltimore County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Anne Arundel County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Howard County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Wicomico County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018.

Exhibit 2-6 below shows the estimated percentage of time students on IEPs spend with their general education peers, by LSS/PA, from lowest to highest, with the average represented by the blue line.[29]

Exhibit 2-6. Estimated Percentage of Overall Time in General Education Settings for Students with IEPs, 2018



Source: Maryland State Department of Education. Staff Salary File. SY2014-2018; Maryland State Department of Education. Maryland Online Individualized Education Program (MOIEP) Data. SY2015 through 2019; Baltimore County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Anne Arundel County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Howard County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018; Wicomico County Public Schools. Online Individualized Education Program (OIEP) Data. SY2018.
Note: The minimum percentage in Exhibit 2-7 is set at 50% to better illustrate the variation, but it should be noted that the range is relatively small from around 65% to just over 80%, with most districts between about 70% and 75%.

[29] Specifically, this estimate assumes the median percent time in GenEd settings within each LRE GenEd category range, and 0% for all other categories. For example, students in the category of "Inside General Education – 80% or more" are assumed to be in these settings 90% of the time. Absent more detailed information on each student's actual time in these settings, the researchers chose to assume the median to minimize error above and below the assumed value.

Appendix 3: Cost model methods

There are four commonly used approaches to determine the resources necessary to achieve adequacy in the context of a state's educational system. In 2006, Harr et al. evaluated these approaches for determining special education adequacy in California. To this end, the authors conducted a review of adequacy studies that included students with disabilities. The authors found four common approaches to measuring educational funding adequacy (below) and provided a review of each as it relates to special education. The approaches are organized into two methods defined by Taylor et al. (2005): adequacy based on resources (inputs) and adequacy based on student performance (outcomes). The four approaches are defined by the authors as follows:

- *Professional judgment*: a resource-oriented method in which panels of educational professionals specify an array of services and resources they believe to be necessary for an "adequate" education.
- *Evidence-based*: a resource-oriented method in which researchers attempt to draw upon resource specifications that have been shown by research to be effective in improving student achievement.
- *Successful schools/districts*: a performance-oriented method in which researchers identify schools or districts within a state that are successful based on certain outcomes (e.g., aggregate performance on standardized tests, dropout rates, graduation rates) and estimate a base cost for these schools (or school districts) using their actual current basic expenditures.
- *Cost functions*: a performance-oriented method that provides a systematic way to calculate the relationship between spending and educational outcomes, controlling for differences in student needs, district characteristics, and geographic variation in teacher compensation.

Several confounding factors arose when the authors attempted to determine adequacy in special education using student performance data (e.g., successful school and cost functions): (1) the extent to which students with disabilities are (or are not) cognitively able to meet academic standards — some students may not meet academic standards regardless of investment; (2) the ambiguity in identification rates — schools have some flexibility in finding students eligible for special education or not, suggesting that a higher percentage of students identified with disabilities does not necessarily correlate to student need; and (3) the variation in the level of need for students in any given eligibility category (Harr et al., 2006). These challenges often led adequacy researchers to simply remove students with disabilities when providing recommendations and instead advise states to continue with their current funding approach (Harr et al., 2006).

The most comprehensive investigation of costs associated with supporting students with disabilities was the Special Education Expenditure Project (SEEP), which was completed in 2002. SEEP culminated in a series of descriptive reports using information from more than 9,000 students with disabilities across 1,000 schools in 45 states and the District of Columbia for the 1999–2000 school year. The researchers found that districts expended about $5,918 more per student on students qualifying for special

education and that special education expenditures made up 13.9% of the total K–12 education expenditures nationally (Chambers, Parrish, & Harr, 2002). These estimates were drawn from calculations that attempt to determine how much more is spent on students with disabilities beyond what is spent on a general education student. This distinction is important because students with disabilities are general education students first — that is, they benefit from the general expenditures in their LEA (e.g., administrative services) as well as from special education expenditures (e.g., special education teachers). Up to this point, the SEEP data have provided some valuable insights into special education costs and how researchers and policymakers might conceptualize adequacy studies in the future.

In an effort to build on the prior SEEP study and apply the benefits of an adequacy approach while exploring techniques to minimize potential limitations, this analysis follows Taylor, Willis, Berg-Jacobson, Jaquet, and Caparas (2018) and Gronberg, Jansen, and Taylor (2017) by using stochastic frontier analysis (SFA) to estimate an educational cost function for Maryland. Put simply, a cost function identifies a relationship between spending and student outcomes.[30] In so doing, it can then be used to estimate the minimum level of resources associated with a particular set of target outcomes.

Overview

The Maryland education cost function was estimated using the SFA. The SFA is an estimation technique that allows for the possibility that the expenditures might exceed minimum cost for one of two reasons: random errors or inefficiency.[31] If there is no inefficiency, then the SFA will yield the same model estimates as ordinary regression analyses. However, if there are inefficiencies, then the SFA will yield a better prediction of the cost of education than will other estimation techniques. Because research has indicated that a variety of factors — including a lack of competition — can lead to school district inefficiency, the SFA is the most appropriate estimation technique for this analysis.[32]

Formally, the cost function model used in this analysis can be expressed as:

$$\ln E^* = \ln C(w_1,\ldots w_k; z_1,\ldots z_k; y, N|\beta) - \ln N + v + u(x,\delta) \qquad (1)$$

where E* is observed expenditures per pupil in the school, w1 are input prices, z1 are quasi-fixed inputs, including environmental factors, y is a vector of outcomes, N is the number of students, ß is the cost parameter vector to be estimated, v is the random noise component representing exogenous random

[30] In this context, "relationship" refers to how a change in one is associated with a change in the other, specifically, how adjustments in the level of spending at a given school are associated with the outcomes of students attending that school.
[31] Specifically, it assumes that the random errors consist of two parts, a standard two-sided random error that may be positive or negative and is zero on average and a one-sided error that is always positive or zero. The greater the one-sided error, the further a school is from the minimum and the more "inefficient" its spending is.
[32] For example, see Belfield and Levin (2002); Dee (1998); Gronberg, Jansen, Karakaplan, and Taylor (2015); Duncombe and Yinger (2005); Grosskopf, Hayes, Taylor, and Weber (2001); Kang and Greene (2002); and Millimet and Collier (2008).

shocks (e.g., noisy private construction outside on testing day), and u is the one-sided error term that is a function of factors impacting inefficiency (x) and a parameter vector (δ).

The specification in equation (1) treats school enrollments and outcomes — both of which are influenced by the decisions of school administrators — as independent variables, raising concerns about possible endogeneity (i.e., a correlation between the explanatory variables and the error terms).[33] Thus, this analysis also adopts a control function approach to the potential endogeneity of the outcome and enrollment measures.

Key Strengths

The key strength of a cost function method over alternative methods is that it is able to use the observed experiences of nearly all public schools in the state, rather than relying on a sample of experiences or settings whether by way of a selected group of practitioners (professional judgment), a selected sample of schools (successful schools), or a selection of research studies tested in a small number of environments, in some cases outside the state (i.e., evidence-based).

Another benefit of the cost function is its ability to take into account the impact of how aspects of environmental context can influence the relationship between spending and outcomes, often referred to as "cost factors." A few of the key cost factors include (1) measures of a school's level of student need, (2) its operational scale, and (3) the local regional costs relative to other parts of the state. These factors are:

- **Level of Need**: It is well-established that students with greater needs require different and often more resources to achieve a target outcome, thus impacting spending.
- **Operational Scale**: It is also a well-established economic principle — economies of scale — that an operation (i.e., a school) that is larger in scale is able to pay less per unit (i.e., per-student) than a smaller operation to provide the same output — in this case, educational opportunity and learning (i.e., economies of scale)..
- **Regional Costs**: The cost to purchase the same resource will vary regionally due to differences in cost of living or the local economy. These cost factors are discussed in more detail in subsequent sections of this appendix.

And finally, the cost function analysis method used for this study allows for estimates to consider spending that does not contribute to the outcomes included in the model (or other outcomes correlated with the outcomes included). Put more simply, the model can estimate and adjust based on the extent to which school spending is either wasteful, in that the same outcomes could be reached with fewer dollars, or directed to activities supporting outcomes not well correlated with the model's academic outcomes. These results are typically referred to as the efficiency of spending, but it is critical to note

[33] For example, see the discussions in Duncombe and Yinger (2005, 2011); Imazeki and Reschovsky (2004); and Gronberg, Jansen, and Taylor (2011a).

that such activities may be necessary to meet the state's obligation to its students with disabilities. Thus, in this context, the term *inefficient* should not be viewed as categorically negative.[34] In summary, the model assumes that some spending is not required to meet the outcome targets, but makes no assumption that this spending is always unnecessary to meet the state's obligation to students with disabilities.

Illustrative example: Establishing and validating model predictions

Notwithstanding these strengths, the cost function model is often seen as overly complex and thus less transparent than other available approaches. It is true that its key strengths require it to be a complex, multidimensional analysis, and this makes it hard to put in simple terms. Given this, an illustrative example may be useful.

Suppose you want to predict a person's salary and you believe that age and educational attainment will help with this prediction based on your belief that older people tend to make more and less educated people tend to make less.

The techniques used in the cost function would allow you to use salary, age, and attainment data to determine exactly how, on average, age and educational attainment relate to salaries when *both are taken into account*. Further, the cost function methods would allow you to *predict* salaries for combinations of age and attainment not found in the data. Instead of salaries, the cost function analysis for this report predicts school spending, and instead of age and attainment, it is drawing on cost factors to improve this prediction and with specific student outcomes held at a given target.

To test the validity of the model the researchers primarily consider the extent to which the actual data deviate from the prediction. Extending the analogy, suppose projected salaries for a given age and attainment level observed in the historical data are very far from the actual salaries. For example, a 25-year-old with a master's degree is predicted to have a salary of $65,000, but the actual salaries for these individuals range from $20,000 to $150,000. This may suggest that something other than age and attainment is explaining the observed historical salaries or it may simply signal that the model prediction is not very precise. In general, statistical significance is the test used to assess the success of the model in this respect.

Ultimately, the researchers are seeking to create a model that best fits the data available and includes all information that improves the strength of our prediction without adding information that offers no such improvement. As a result, although a variety of cost factors may be considered for inclusion in the model based on relevant research, not all considered measures improved the model or were ultimately included.

[34] Given the complexity of skills and services that support a student with disabilities to achieve academically, it is not feasible to parse the specific spending that falls into this category, and the modeling made no attempt to do so. Instead, the model uses statistical techniques and prior knowledge of factors in efficiency of spending to estimate the level of spending contributing to uncorrelated outcomes in aggregate.

Main Limitations

There are two primary limitations to this approach to estimating the adequate level of resources. It is important to note that the first, and most significant, of these is also a limitation on all common approaches to creating such estimates. Although methods do exist that are not constrained by this limitation, there are practical limitations on implementing these approaches, and as a result, they are not commonly feasible as a method for addressing questions of funding adequacy.

Limitation #1: Estimated Funding Does Not Guarantee Outcomes

The researchers cannot infer that a particular level of spending will *cause* a particular set of outcomes, however strong the model. Specifically, the adequacy estimate is the researchers' best prediction of the minimum funds required in a given setting if spent effectively. There is no guarantee that all LSSs will actually make effective spending choices.

Moreover, although our model is designed to account for potential sources of bias, our ability to do so is constrained by the information available to us. Sources of bias cannot ever be entirely mitigated, no matter what the method, so our aim is to be as transparent as possible as to the potential sources of bias, how the researchers account for them if they can, and their most likely effects on the results.

Limitation #2: There Is No Evidence on Strategic Resource Allocation

Unlike other approaches to estimating the adequate level of funding, a cost function analysis cannot provide direct evidence with respect to strategic resource allocation contained within the methodology. The level of school spending is only observed in the model in aggregate, and comprehensive data on *how* the funds are spent are not examined in this component of the study.

Other analyses in the study complement this limitation. For example, this includes providing evidence of effective distribution policies (state-level weights study and national/international policy scan) and of effective resource allocation practices for providing services to students with disabilities (e.g., engagement with LSS/PA directors of special education, focus groups with school staff, and analysis of LSS staffing plans).

Summary Statistics

The table below displays the summary statistics for key variables in the cost function analysis.

Exhibit 3-1. Descriptive Statistics for Schools in Maryland, 2017–18

Variable Name	Count	Average	SD	Min	Max
Per-Pupil School Operating Expenditures	1200	$13,257	$2,116	$8,835	$39,132
District Enrollment (log)	1200	11.03	0.97	7.58	12.00

Variable Name	Count	Average	SD	Min	Max
School-Level Avg. NCE Score (all students)	1200	0.50	0.05	0.32	0.72
School-Level Avg. IEP Progress	1200	0.11	0.05	0.03	0.38
School-Level SPED Graduation Rate	1200	0.68	0.09	0.19	1.00
School-Level Non-SPED Graduation Rate	1200	0.89	0.07	0.53	1.00
School Membership (log)	1200	6.39	0.50	4.67	8.04
County-level CWI-FT (log)	1200	0.29	0.09	0.00	0.37
Miles to the Nearest MCSA	1200	18.90	9.30	0.17	36.93
School-Level Percent FARMS	1200	0.46	0.25	0.01	1.00
School-Level Percent LEP	1200	0.10	0.13	0.00	0.73
School-Level Percent SPED	1200	0.12	0.05	0.04	0.42
Other School Indicator	1200	0.01	0.11	0.00	1.00
Middle School Indicator	1200	0.18	0.38	0.00	1.00
High School Indicator	1200	0.12	0.33	0.00	1.00
School-Level Percent Highest-Cost Disabilities (within SPED population)	1200	0.00	0.01	0.00	0.08
School-Level Percent High-Cost Disabilities (within SPED population)	1200	0.05	0.05	0.00	0.46
School-Level Percent Medium-Cost Disabilities (within SPED population)	1200	0.45	0.19	0.02	0.99
School-Level Percent Low-Cost Disabilities (within SPED population)	1200	0.50	0.18	0.01	0.92
CEP School Indicator	1200	0.13	0.34	0.00	1.00
School-Level Percent Academic Need - Math (within SPED population)	1169	0.63	0.20	0.05	0.99

Variable Name	Count	Average	SD	Min	Max
School-Level Percent Academic Need - Reading (within SPED population)	1169	0.67	0.18	0.07	0.99
School-Level Percent Academic Need - Writing (within SPED population)	1169	0.49	0.19	0.00	0.96

Source: Authors' calculations based on cost function model analysis.

Appendix 4. Cost function data sources and outputs

Unit of Analysis

The education cost function analysis is a school-level analysis, and thus the estimates provided are based on estimating school-level spending. While there is tremendous variation in school context captured in this analysis, there are still environments which could not be included in the analysis. Schools were generally excluded for the following reasons: (1) they were nonpublic settings; (2) their environment, program, or student population was so unique as to be incomparable to typical settings; or (3) they were missing key data required for the model or represented extreme outliers.

The rationale for these exclusions is explained in more detail below.

Nonpublic Settings

The scope of this study was confined to public schools and this constraint was clearly outlined by the MSDE in writing and in conversations about the study. Nonetheless, the researchers recognize the complex interaction between public school students with disabilities and nonpublic providers of educational services. That is, that there are certain LSS and school environments in which the services determined in the IEP for the student with disabilities is unable to be accomplished within the capability of the public-school setting. It then becomes necessary to contract with nonpublic settings, agencies, and services to provision those supports for the student. Maryland has an established process by which LSSs can provide appropriate documentation for the placement of a student in a nonpublic setting then seek and obtain reimbursement for a portion of the cost associated with the support. This is documented in an earlier section of the report in which the researchers described the amount of money that Maryland spends per year for their associated cost of the service. Ultimately, these costs and associated services were not able to include nonpublic settings in the education cost function analysis.

Unique Environment, Program, or Student Population

While every school is unique to some extent, those schools excluded for this reason were substantially unique. This includes, for example, programs in which students took up residence at the school site, or programs provided through the state juvenile justice system serving a unique student population. In essence, these are settings that have an entirely distinct set of circumstances that makes their patterns of spending and resource allocation incomparable to settings without these circumstances.

These school settings included:

- Maryland School for the Deaf
- Maryland School for the Blind

- SEED school
- Juvenile Education Services System

In addition, virtual and charter schools were excluded because of their unique circumstances with respect to setting and, in the case of charters, regulations with respect to school operations.

As a result of the above criteria, 140 schools were excluded from the model.

Missing Data and Extreme Outliers

There were many schools with insufficient data to be included in the model. The most common issues were the following:

- **No expenditure data.** This resulted in the exclusion of 60 additional schools.
- **Insufficient number of students with growth data**. Schools with fewer than 5 students, or those with fewer than 10 and less than two-thirds of students represented in their growth data were excluded. This was to mitigate the unreliability of such small underlying cohorts while accounting for the fact that in some cases, the total school population may be very small. This resulted in the exclusion of about 120 additional schools.
- **Other missing data**. This includes data from the American Community Survey or IEP goals progress data. Only 4 additional schools were excluded as a result.

In addition, 4 additional schools serving only pre-K settings were excluded from the model to mitigate the potential for selection bias on the population of students served in these settings.

Finally, 12 additional schools were excluded because they represented extreme outliers on key model metrics.

In total the above criteria resulted in the exclusion of 340 schools out of the all schools appearing in our collective data files for 2016-17 and 2017-18.

Though these schools were not included in the education cost function the researchers extend the appropriate amount of spending on the basis of the estimates established from the cost model. See the recommendations section for further discussion.

Dependent variable: School-level expenditures

To construct our measure of school-level spending the researchers first identified operating expenditures appropriate to the cost function analysis. The researchers then used district-level spending data and individual-level salary data to construct a school-level measure of spending. These two steps are described in detail below.

Identifying Operating Expenditures

For each school, the researchers identified total operating expenditures, including the day-to-day LSS expenses, such as salaries, benefits, purchased services, and supplies and materials. For the purposes of this analysis, the following are not considered operating expenditures: expenditures outside of the Current Expense Fund, transfers, fixed charges (except for benefits), community services, capital outlay, and adult education. Following the literature, food service and transportation expenditures were also excluded. The table below details the specific exclusions and restrictions to isolate operating expenditures.

Exhibit 4-1. Specific Exclusions to Isolate Operating Expenditures

Isolate Expenditures
Restrict to the Current Expense Fund and the Expenditure class
Exclude sub-object codes Transfers - Maryland LEAs (881), Transfers - Interfund (886), Transfers - Indirect Cost Recovery (890)
Identify Operating Expenditures
Exclude Student Transportation class category (209)
Exclude Fixed Charges class category (212) except sub-objects Employee Retirement (412), Social Security (413), Other Employee Benefits (414), and State - On Behalf of Payment - Teacher's Retirement.
Exclude Food Services class category (213) - *note this was excluded in a prior step as all spending is outside of the Current Expense Fund.*
Exclude Community Services class category (214)
Exclude Capital Outlay class category (215)
Exclude Adult Education - Salaries and Wages (20312), Textbook and Instructional Supplies (201412), and Other Instructional Costs (20512).

These exclusions were made primarily because the research team believes the excluded categories of spending do not produce the academic outcomes in the model; they primarily produce other outcomes. These are important but ultimately do not fit in an analysis identifying an association with academic outcomes.

For example, the purpose of transportation expenditures is to effectively bring students to and from school. This is true for all student populations, including students with disabilities. Thus, the relevant outcome standard for these expenditures would be some measure of the effectiveness of a school's

transportation services. This is not to suggest that there isn't some association between an effective transportation program and student academic outcomes; there certainly is. But this is only through the success of the transportation program which is a result of spending.

Similar to transportation, food service expenditures produce a set of outcomes distinct from academic outcomes and would be estimated based on a different outcome standard.

As school-level expenditure data was not available for the years of our analysis, the researchers developed a procedure for estimating these data using district-level expenditures in the annual financial report (AFR) data provided by MSDE in combination with the individual-level staff salary file. Specifically, the following process was used:[35]

- Calculate total school-level salaries, with the above exclusions, based on individual-level salary data.
- Calculate total payroll (salaries and benefits) for each school by adjusting the school-level salaries by the district-specific benefits ratio. In other words, if the benefits paid by District A were 25% of salary, then adjust upward by 25% the school-level salaries for all schools in District A.
- Calculate the district payroll total and subtract it from the overall AFR district-level expenditure total with the above exclusions.
- Allocate the difference between the two totals to schools on a per-pupil basis.

Estimating General Education Expenditures Supporting Students with Disabilities

One of the primary challenges in isolating spending on special education is that there are expenditures classified in the AFR data for all students, but which also support students with disabilities. This contribution of general education resources would therefore ideally be taken into account when considering available resource for students with disabilities. In particular, the contributions of general education instructional staff are significant.

This section further discusses: (1) the motivating assumptions driving estimation of general education contributions, (2) the position categories for which these expenditures will be estimated, and (3) the special approaches applied to create the estimates.

Motivating Assumptions

The first motivating assumption is that expenses supporting educational services to students with IEPs are not fully captured in the budget codes labeled as "Special Education."

[35] Gronberg, Jansen, and Taylor (2012) and Grosskopf, Hayes, Taylor, and Weber (2013) used a similar approach.

The second assumption is that these educational services include a combination of the basic services all students receive, and the additional services provided to students through their specific IEP.

The third assumption is that these two types of services cannot be disentangled in any practical way because of the evolution of inclusive practices.

The fourth and final assumption is that a full accounting of these additional expenditures would not be of practical use, but there are particular position categories for which they are uniquely policy relevant.

Position Categories

As mentioned above, the contributions of instructional positions are particularly critical. These staff positions serve both special education and general education (GenEd) contexts and thus, depending on the extent of the inclusion of students with disabilities in GenEd settings, dedicate a portion of their time to providing special education services. This includes Teacher/Instructor (position code 11), Staff Developer/Teacher Trainer (position code 12), Other Instructional Personnel (position code 13), and Teacher Aide/Teaching Assistant (position code 26).

Also important are positions that do not have a valid special education budget code in the Staff Reporting Manual but that the researchers know from conversations with practitioners dedicate a portion of their time to providing special education services. This includes Guidance Counselor (position code 20), Psychologist (position code 21), School Social Worker (position code 23), and Nurse/Hygienist/Health Professional (position code 24).

Unfortunately, due to limitations in available data the research team was only able to estimate the first of these two groups. Were better information available with respect to the percentage of time allocated by the second set of positions (Guidance Counselors, etc.) to students with disabilities, the researchers believe constructing an estimate would be of benefit.

GenEd Instructional Staff Estimate

Our approach to estimating the time and resources allocated to special education services by GenEd instructional staff is based on a three-step formula:

- **Step 1**: Assume a continuous percentage of student time spent in GenEd settings for each least restrictive environment (LRE) category. The researchers assume the median of each GenEd category range, and zero for other categories.
- **Step 2**: Calculate the adjusted student full-time equivalents (FTEs) associated with the LSS/PA distribution of LRE categories by applying the assumed continuous percentage.
- **Step 3**: Divide the adjusted student FTEs by the total student count to estimate the percentage of GenEd teacher time allocated to these students.

Exhibit 4-2 below illustrates this process with example data

Exhibit 4-2. Procedure for estimating GenEd instructional time serving students with IEPs

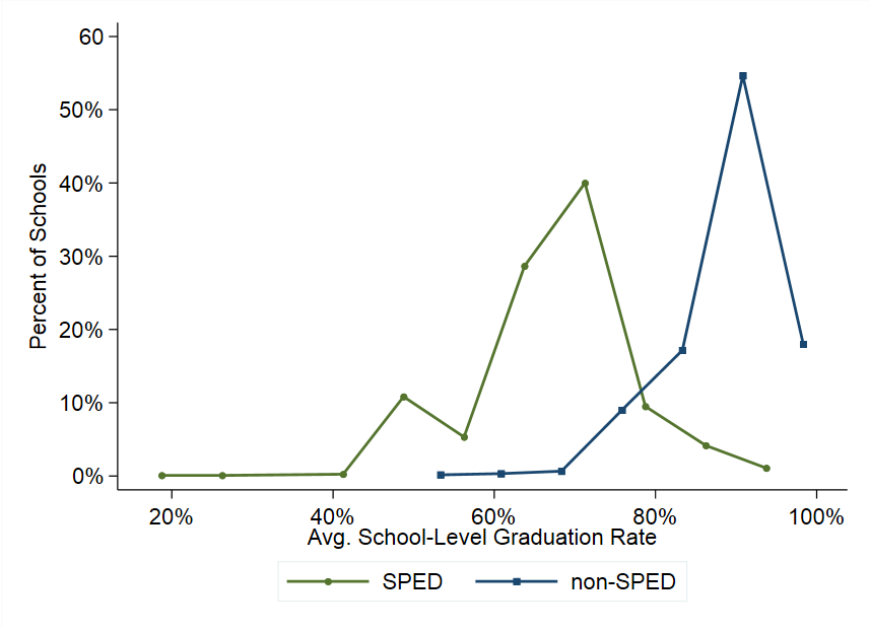
LRE Category	(A) Continuous Percentage	(B) Total SPED Count	(C) % by Category	(D) SPED Count by Category (B*C)	(E) Adj. SPED Count (A*D)	(F) Total Adj. SPED Count (sum of E)	(G) All Student Count	(H) % of GenEd Time (F/G)
SAMPLE DATA 1								
80% - 100%	90%	400	75%	300	270	320.4	2500	~13%
40% - 80%	60%	400	20%	80	48	320.4	2500	~13%
0% - 40%	20%	400	3%	12	2.4	320.4	2500	~13%
Other	0%	400	2%	8	0	320.4	2500	~13%
SAMPLE DATA 2								
80% - 100%	90%	400	3%	12	10.8	118.8	2500	~5%
40% - 80%	60%	400	20%	80	48	118.8	2500	~5%
0% - 40%	20%	400	75%	300	60	118.8	2500	~5%
Other	0%	400	2%	8	0	118.8	2500	~5%

Student Outcomes

This analysis uses a levels measure of quality and a growth measure of quality. The levels measure is the summative evaluation of high school achievement — graduation rate. The researchers were provided with school-level graduation data for all students and for students with disabilities only. These rates represent the percentage of each longitudinal cohort that graduated within four years.

The district-level graduation rate was applied to schools with no reported graduation rate, such as elementary and middle schools. Exhibit 4-3 displays the distribution of graduation rates for schools included in the analysis sample in the most recent year, 2017-18.

Exhibit 4-3 Maryland School-Level Graduation Rates, 2017-18



Source: MSDE Graduation Data, 2013-14 – 2017-18

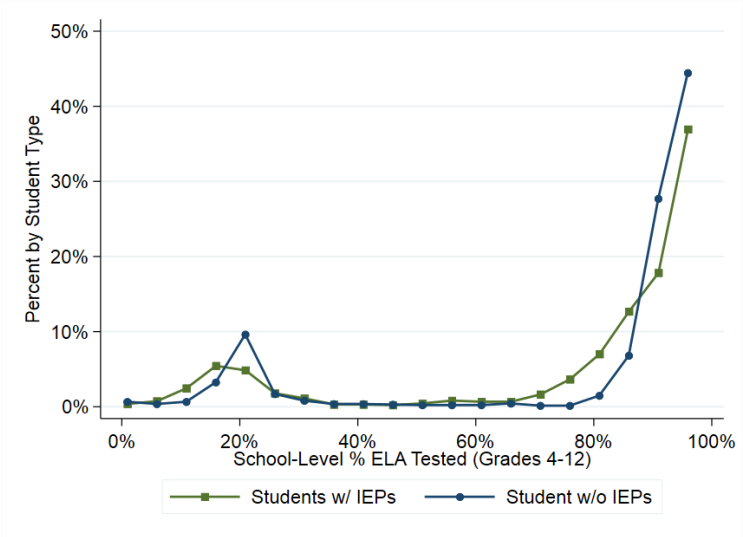
Academic growth: Normalized curve equivalents (NCE)

The growth measure is a normalized gain score indicator of student performance on Maryland's standardized, annual assessments. During years in which assessment results were used for this analysis, Maryland participated in the Partnership for Assessment of Readiness for College and Careers (PARCC) including test scores for English Language Arts (ELA) and mathematics in grades 3 through 8, the first tested grade in high school between 2015-16 and 2017-18. Test performance was also included for students that took the Maryland Standardized Alternate Assessment (MSAA). Per guidelines for standardized testing in Maryland, students who take the MSAA are students with severe cognitive disabilities.

It is important to note that the researchers were unable to analyze data prior to 2015-16 due to limitations in the Maryland alternate assessment prior to that year. Specifically, the prior alternate assessment used a 0-10 scale, severely limiting the variation. The test results also exhibited a highly skewed distribution, unlike the subsequent test, calling into question whether comparisons of the two tests would be appropriate.

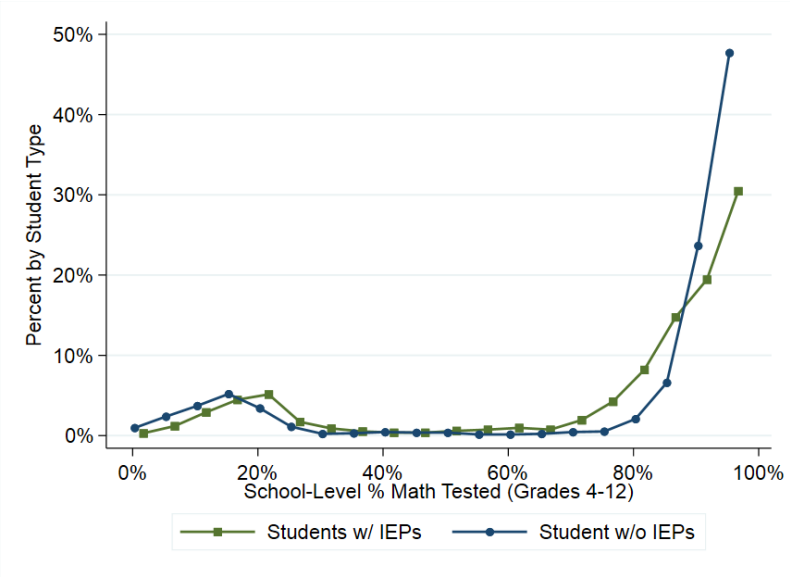
Important in the use of the standardized, annual assessments is to assess reasonable participation rates for both ELA and math. Exhibit 4-4 and 4-5 below show participation rates on the ELA and math assessments by student type (students with disabilities and students without disabilities).

Exhibit 4-4. Maryland School-Level Percent Tested, ELA by Student Type, 2017-18



Source: MSDE Assessment Data, 2015-16 – 2017-18

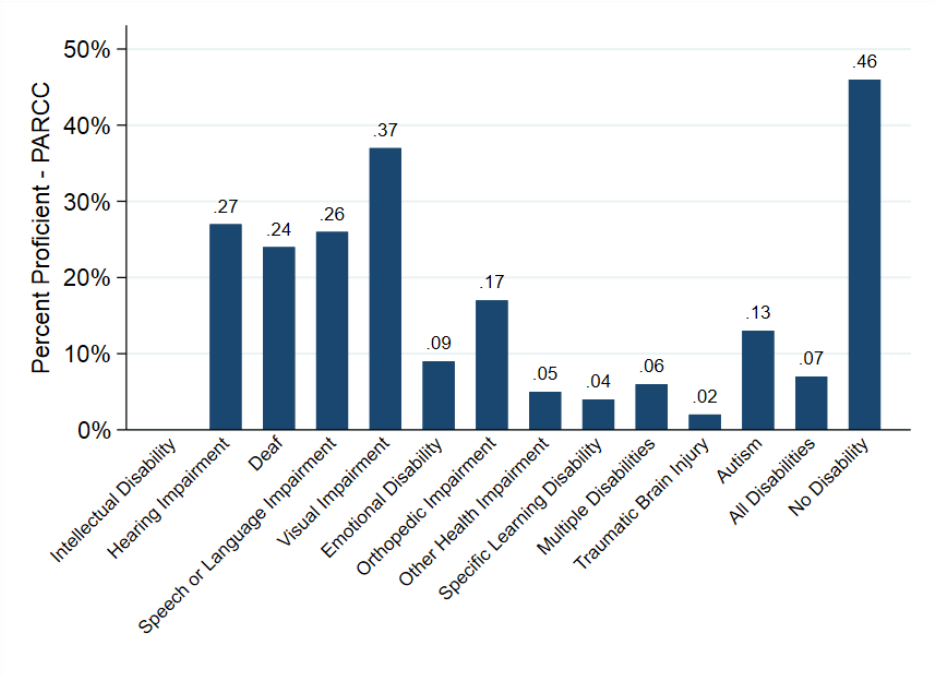
Exhibit 4-5. Maryland School-Level Percent Tested, Math by Student Type, 2017-18



Source: MSDE Assessment Data, 2015-16 – 2017-18

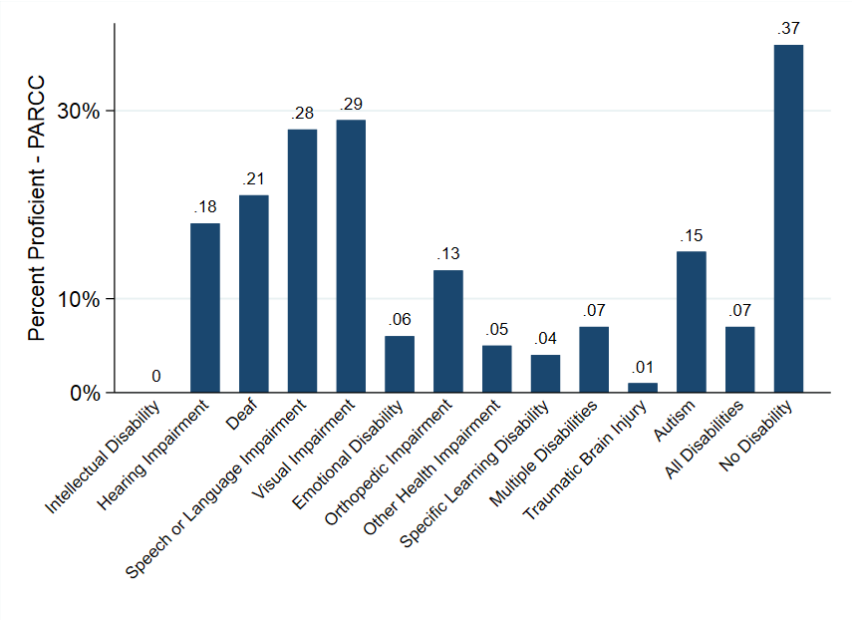
The following exhibits, 4-6 and 4-7 show the distribution in performance on the PARCC.

Exhibit 4-6. Maryland Percent of Students with Disabilities by Category Proficient, PARCC ELA by Disability Category, 2017-18



Source: MSDE Assessment Data, 2015-16 – 2017-18

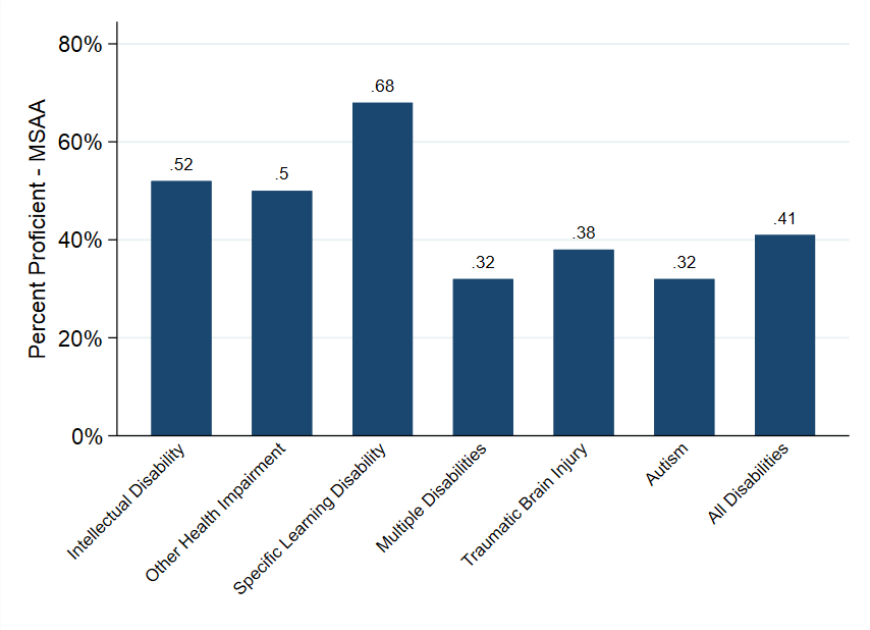
Exhibit 4-7. Maryland Percent of Students with Disabilities by Category Proficient, PARCC Math by Disability Category, 2017-18



Source: MSDE Assessment Data, 2015-16 – 2017-18

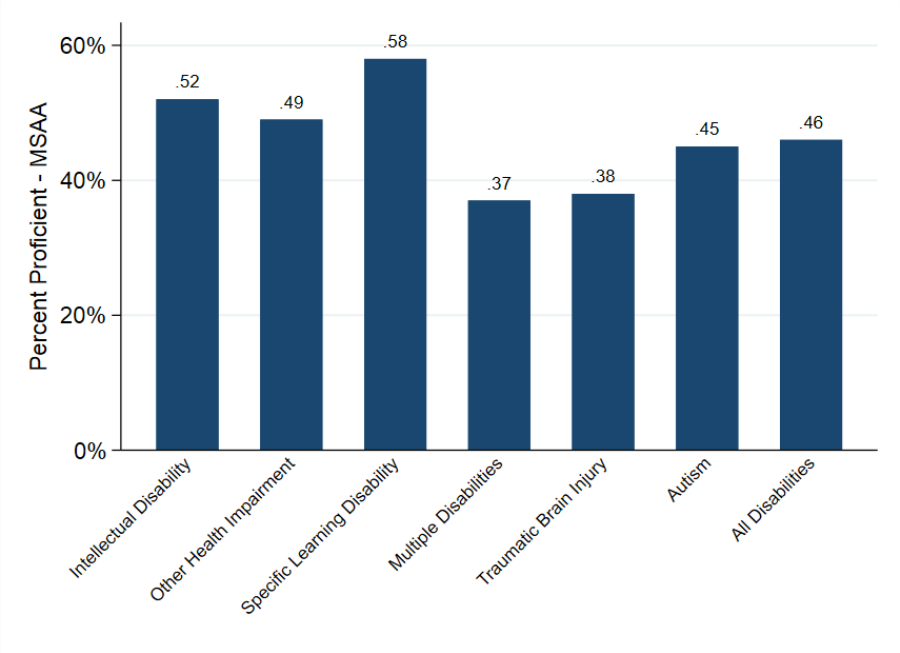
The following exhibits, 4-8 and 4-9, show the distribution in performance on the MSAA.

Exhibit 4-8. Maryland Percent of Students with Disabilities by Category Proficient, MSAA ELA by Disability Category, 2017-18



Source: MSDE Assessment Data, 2015-16 – 2017-18

Exhibit 4-9. Maryland Percent of Students with Disabilities by Category Proficient, MSAA Math by Disability Category, 2017-18



Source: MSDE Assessment Data, 2015-16 – 2017-18

Assessment scores can be difficult to compare across years, grade levels, and test subjects. Therefore, this analysis relies on normalized (or, equivalently, standardized) test scores. The normalization follows Reback (2008) and yields gain score measures of student performance that are not biased by typical patterns of reversion to the mean.

The calculation of normalized gain scores proceeds in three steps. First, transform the scores of individual students into conditional z-scores. Denote the test scores for student (i), grade (g), and time or year (t) as S_{igt} and measure each student's performance relative to others with same prior score in the subject as:

$$Y_{igt} = \frac{S_{igt} - E(S_{igt}|S_{i,g-1,t-1})}{[E(S_{igt}^2|S_{i,g-1,t-1}) - E((S_{igt}|S_{i,g-1,t-1})^2]^{.5}} \quad (2)$$

For example, consider all Grade 6 students who had a score of 300 on the prior year's Grade 5 assessment in Mathematics. For this subgroup of students with a Grade 5 score of 300, calculate the mean and standard deviations of the Grade 6 scores for Mathematics. The mean is the expected score in Grade 6 for someone with a Grade 5 score of 300; the standard deviation is the denominator in equation (2). Thus, the variable Y_{ijgt} measures individual deviations from the expected score, adjusted for the variance in those expected scores. This is a type of z-score. Transforming individual assessment

scores into z-scores in this way allows researchers to aggregate across different grade levels and test subjects despite the differences in the content or scaling of the various tests.[36]

Second, calculate the average conditional z-score (i.e., the average Y_{igt}) across all required mathematics and reading tests for all of the students attending each school. An average conditional z-score of 1 indicates that, on average, the students at School A scored one standard deviation above the expected score for students with their prior test performance. An average conditional z-score of –1 indicates that, on average, the students scored one standard deviation below expectations.

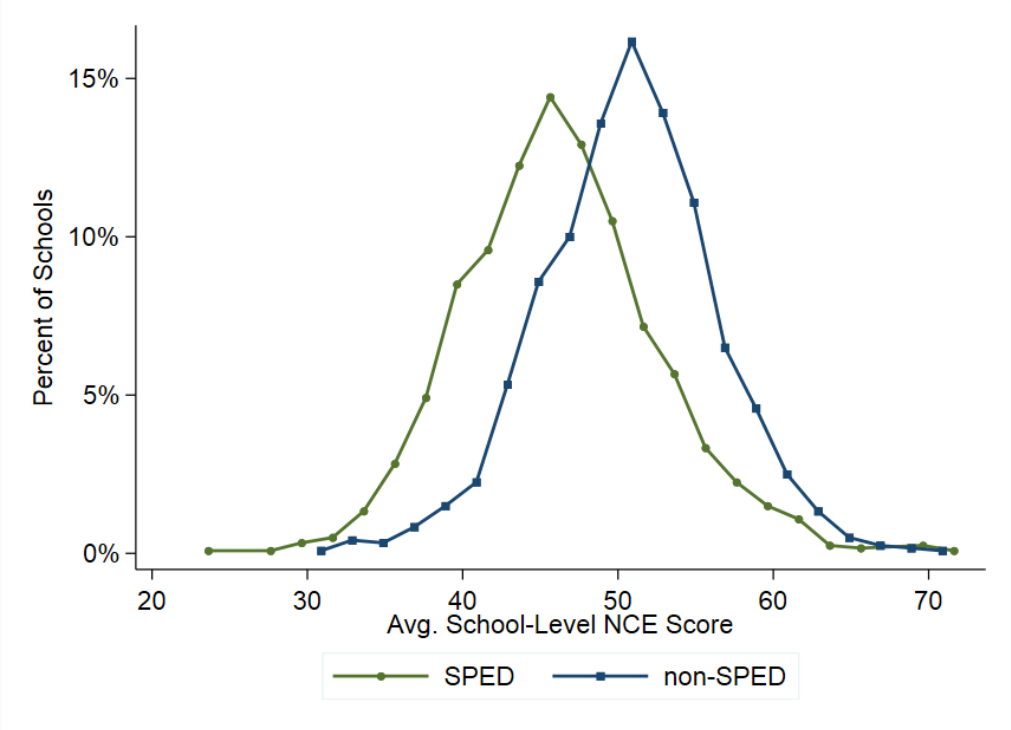
Finally, for ease of interpretation, transform the z-scores into conditional normal curve equivalent (NCE) scores. NCE scores (defined as 50+21.06*z) are a monotonic transformation of z-scores that are commonly used in the education literature and can be interpreted as if they were percentile ranks.[37] A Conditional NCE score of 50 indicates that (on average) the students performed exactly as expected given their prior test performance, and a Conditional NCE score of 90 indicates that (on average) they performed as well as or better than 90% of their peers.

For estimation purposes, the Conditional NCE scores are expressed as percentages. As Exhibit 4-10 illustrates, the school-average Conditional NCE score in the researchers' estimation sample for all students had a mean of 0.50 with a minimum of 0.32 and a maximum of 0.72. The school average within students with disabilities and students without disabilities varied, with a mean of 0.46 for students with disabilities and a mean of 0.51 for those without. Exhibit 4-10 displays the distribution of school-level average scores for each population in the most recent year of data, 2017-18.

[36] As part of this process, the researchers identified students with unusual testing trajectories. Cases were treated as administrative error and deleted if students displayed reasonably impossible assessment trajectories (e.g., moving backward in grade-level assessment, making large leaps in grade-level assessments across successive years). For other cases with nontraditional assessment order or very large gaps between current and previous test scores, the researchers included all instances as long as the pattern occurred in at least 20 cases across the state.

[37] Technically, this interpretation only holds if the scores are normally distributed. Given the large number of students tested each year in Maryland, normality is a reasonable assumption.

Exhibit 4-10. Maryland School-Level Average Conditional NCE Scores, 2017-18



Source: Authors' calculations based on cost function model analysis

It is commonly accepted that schools produce unmeasured outcomes that may be uncorrelated with mathematics and ELA test scores and that standardized tests may not measure the acquisition of all important higher-order skills. However, test outcomes and graduation rates are performance measures for which LSSs are held accountable by the state, and these are the most common measures of school district output in the literature (e.g., Gronberg, Jansen, & Taylor, 2011a, 2011b, 2017; Imazeki & Reschovsky, 2006). Moreover, the Division of Early Intervention and Special Education Services Strategic Plan identifies both of these measures as "measures of success" with respect to serving students with disabilities in particular.

Therefore, while these measures are limited, they are reasonable output measures for a cost analysis. Nonetheless, given that this is a study of students with disabilities, the researchers recognize the need for information on their performance that goes beyond the common measures.

IEP-based goals outcome measure

As discussed in the prior section, the traditional approaches of measuring student progress (e.g., annual student assessments, graduation rate requirements) may not be the most precise tool to measure progress for students with disabilities. With access to statewide information about all students with disabilities via the MOIEP data and associated submissions from LSSs not currently on the system, the research team sought to construct an outcome measure that was more reflective of the progress that

students with disabilities make throughout the course of the academic year. In reviewing the available information from the IEP form, the researchers identified a measure of progress on IEP goals as a viable source for an additional outcome measure. As Maryland's IEP Process Guide states, "Annual goals and their accompanying objectives/benchmarks define the focus of the specially designed instruction that the student will receive in order to enable him or her to make progress in the general education curriculum."[38] The guide further states that the goals must be aligned with the Maryland College and Career Ready Standards (or the Maryland Alternate Academic Standards).

Rationale for the outcome measure

Specifically, the researchers relied on the progress toward goal metric that underlies the multiple goals established for each student.

There are five possible progress codes that IEP teams can report for students, which include: (1) achieved, (2) making sufficient progress to meet goal, (3) newly introduced skill with progress not measurable at this time, (4) not making sufficient progress to meet the goal, and (5) not yet introduced. The manual notes that "progress determination should be based on data."

In looking at the distribution of the IEP progress towards goal measure, the qualifying categories to assess progress are contained in three of the five codes: achieved, making sufficient progress to meet goal, and not making sufficient progress to meet the goal. Across these codes, the majority of IEP teams marked "making sufficient progress to meet goal," representing approximately 73% of instances in the 2017-18 school year based on the constructed measure.

IEP teams would likely need strong evidence to suggest that the student is not making sufficient progress. This fact is supported by guidance from the manual stating, "If the student is 'Not making sufficient progress to meet the goal', the IEP team must meet to discuss the student's lack of expected progress and the changes that will be made to the student's specially designed instruction (SDI) in order to improve the student's rate of progress."

With this in mind, the researchers chose to examine the average incidence of this progress code, "insufficient progress" across students and schools to establish the measure.

Constructing the outcome measure

In order to establish the measure, the research team took the following steps:

1. Exclusions: There were approximately 0.3% of observations with illogical progress report dates (e.g., the year of data is earlier than the IEP date year). These are assumed to be erroneous and were excluded. Students with progress report dates earlier than their IEP dates are also assumed to be in error. This excludes another approximately 1% of observations.

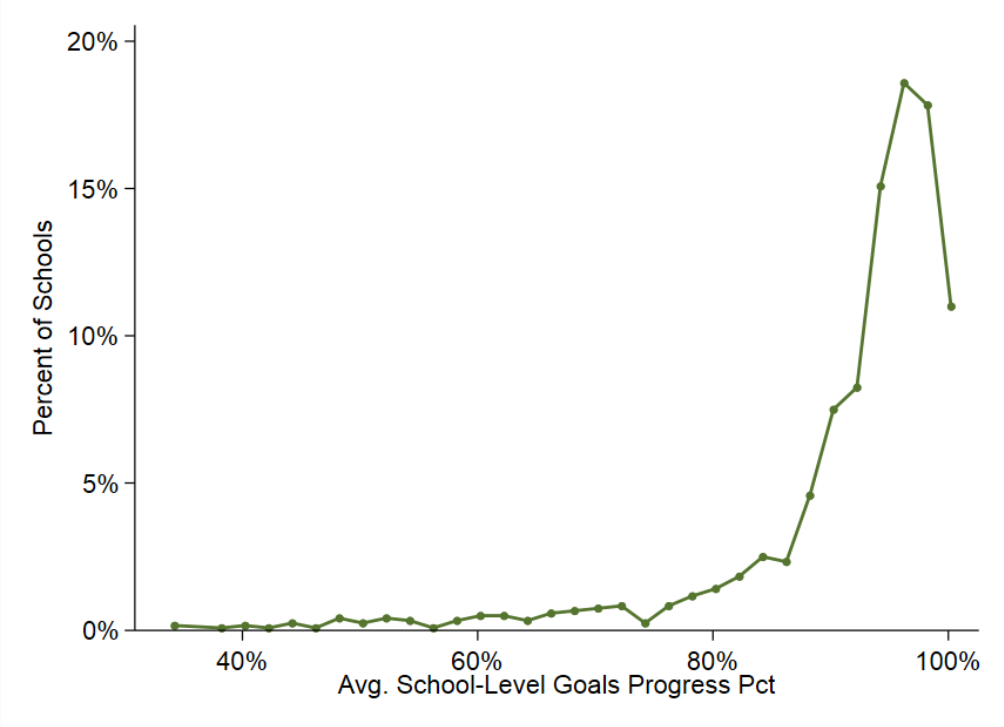
[38] Maryland State Department of Education: Division of Early Intervention/Special Education Services. April 1, 2019. Maryland Statewide Individualized Education Program (IEP) Process Guide. Baltimore, MD. Accessed: November 2019. http://marylandpublicschools.org/programs/Documents/Special-Ed/IEP/MarylandIEPProcessGuide.pdf

2. Measure construction: The measure itself is constructed using the following steps:
    a. Days between IEP date and progress report are calculated as the difference in days between the two dates.
    b. The weighted average incidence of the progress code "insufficient progress" was created at the student level weighted on days between IEP date and progress report. Thus, a zero (0) represents no goals with that progress code and a one (1) means all goals with that code.
    c. The student-level average in step 2 was then averaged at the school level using the latest progress report before the current year IEP as this is typically the best representation of the school's influence on progress in the current year.[39]
    d. The final average was then subtracted from one so it enters the model as a positive outcome. This was done solely for ease of interpretation.
3. Finally, schools with 10 or fewer students contributing to the average were identified and excluded unless the count was between 5 and 10 and the percent of students with a lagged progress code was 66% or more. This is to take into account the effect of small cohorts on the reliability and validity of the estimate and is aligned with the exclusions made with respect to the academic growth measure, the NCE score. This excludes approximately 3.7% of schools.

Exhibit 4-11 illustrates the distribution of the school-level average described above.

[39] This is because a school's contribution to a student's progress on IEP goals is typically concentrated in the period prior to the most recent IEP date, or the last progress report before the current cycle. For example, if a student's IEP was finalized on May 15, 2017 and progress was last assessed on May 1, 2017, a school's contribution for the 2016-17 school year is based on the May 2017 report.

Exhibit 4-11. Maryland School-level Average IEP Goals Progress Percent, 2017-18



Source: Authors' calculations based on cost function model analysis

As a final step, the research team entered the average IEP goal progress measure into the model as an interaction with the overall school-level percentage of students with disabilities. This was primarily to account for the fact that as the overall size of this population increases, the resources required to improve goal progress likely also change. Moreover, as this is an outcome measure only possible among students with IEPs, the size of this population is especially significant.

Results from introducing the outcome measure to the cost model

Overall, the IEP-based goals outcome measure performed very well when introduced to the cost model. The researchers made a notable change in the introduction of the outcomes measure. In an effort to avoid issues of collinearity among the outcome measures (Conditional NCE scores for special education and general education and graduation rates for special education and general education populations) that had already been introduced, the researchers replaced subpopulation-specific academic growth scores with the average score for all students. The primary rationale was that this variable was a better and more consistent gauge of student academic progress once one controls for average progress on IEP goals.

This new outcome measure shows a positive and significant correlation with spending. In other words, as the percentage of students identified as not making sufficient progress increases, the cost associated with students with disabilities increases. Put more simply, as additional resources are introduced,

students tend to make more progress. Further results from this analysis are discussed in the Section 4 conclusions and in the Recommendations and policy implications.

Input Prices

Price of Labor

There are three motivating assumptions for including a measure of regional cost variation in the cost function analysis for the present report.

First, it is assumed that labor costs vary according to differences in local wage demands of a job location, even when applicant qualifications and job duties are identical.

Second, this locational variation in labor costs is driven by two primary factors: (1) local cost of living, and (2) local amenities impacting attractiveness of the community.

Third, failing to account for this variation in labor costs results in inequity whereby LSS/PAs are unable to access the same resources due to their location alone.

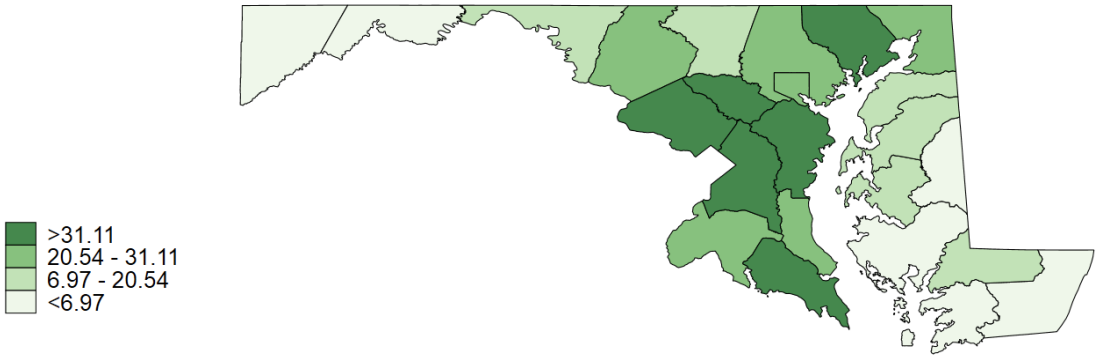
With these assumptions in mind, there are three common approaches to measuring variation in price of labor, each with advantages and disadvantages:

- The first, the Cost-of-Living Index, uses information on the costs of particular goods and services such as housing, food, transportation, energy, etc. This method is straightforward in its construction and broadly understood. In addition, the Cost-of-Living Index includes factors that are beyond LSS/PA control. However, this method does not account for the impact on wage demand of local amenities, or for the attractiveness of a community, two clear disadvantages.
- The second approach, the Hedonic Wage Index, uses actual salary data to estimate regional cost variation controlling for factors that are within LSS/PA control. The current Maryland Geographic Cost of Education Index (GCEI) uses this approach. The clear advantage in this method is the use of actual salary data, which also allows for capturing variation across very small geographic areas. Yet, the Hedonic Wage index is heavily reliant on researcher judgment to distinguish high-spending systems from high-cost systems, reducing its appeal.
- The third method, the Comparable Wage Index, uses wages of workers outside of education to estimate variation in labor costs. Using these wages allows it to capture both cost-of-living and attractiveness of the community, and it is based solely on factors beyond LSS/PA control. The Comparable Wage Index cannot control for the potential differences between the non-educator population and educators, however, and data may not be available at the LSS/PA level.

Overall, these three methods have overlapping strengths, though the research team believes the National Center for Education Statistics (NCES) Comparable Wage Index (CWI) for the most recent available year, offers the most advantages, along with less significant disadvantages than the others.

In addition to capturing factors that the other two measures cannot, the NCES CWI was developed separate from political and policy considerations in Maryland, providing it with additional credibility as an independent measure. Furthermore, this approach is well-established and viewed as credible by the field; for example, it was recommended by Imazeki (2016) as part of an analysis of the available alternatives to the current GCEI.

Exhibit 4-12. Map of Comparative Wage Index (CWI) Values for all Maryland School Districts



Source: NCES Comparable Wage Index for Teachers (CWIFT)

Other Local Prices

In an ideal situation, the estimated cost function would include direct measures of local, nonlabor prices such as instructional equipment and classroom materials. Such data are, unfortunately, not readily available. However, prices for pencils, paper, computers, and other instructional materials are largely set in a competitive market (and therefore unlikely to vary across schools), and prices for nonprofessional labor and building rents are largely a function of school location. Therefore, the cost analysis includes a measure of the distance in miles to the nearest metropolitan or micropolitan area, used as an indicator of a school's rural location/remoteness.

Other Environmental Factors

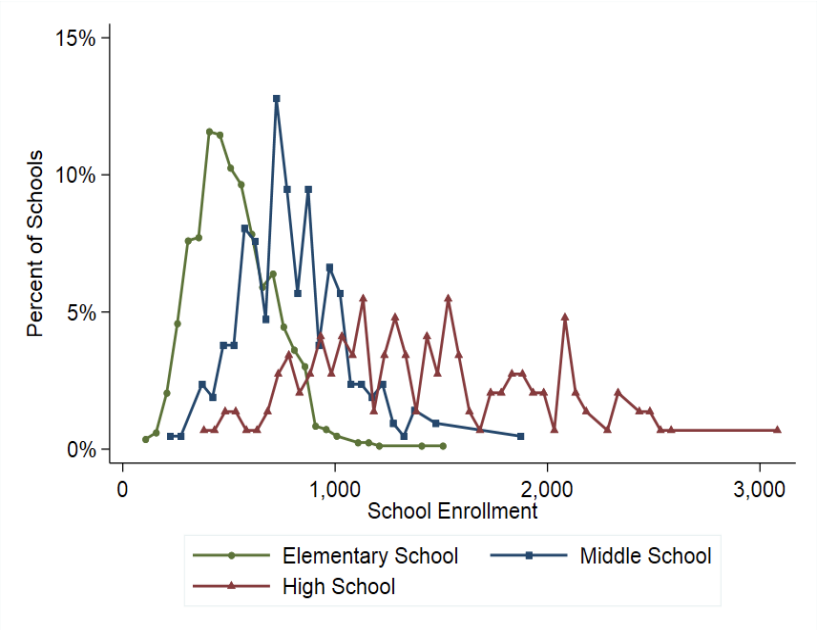
The model includes indicators for a variety of environmental factors that influence district cost, but that are not purchased inputs.

District Enrollment

A major environmental factor in this study is district enrollment, measured in this analysis using MSDE attendance files reporting end-of-year membership. In the estimation, sample district enrollment

averaged 85,460 students, with a minimum of 1,965 and a maximum of 162,955. There are 25 school systems or LSSs in Maryland. Enrollment figures are derived from the 2017-18 school year.

Exhibit 4-13. School Enrollment for Standard Building in Traditional School Districts, 2017-18



Source: MSDE, End-of-Year Attendance Files, SY 2014–2018.

Student Needs

To account for variations in costs that derive from variations in student needs, the cost function includes the percentages of low-income students, limited English proficient students, and students with disabilities in each district.

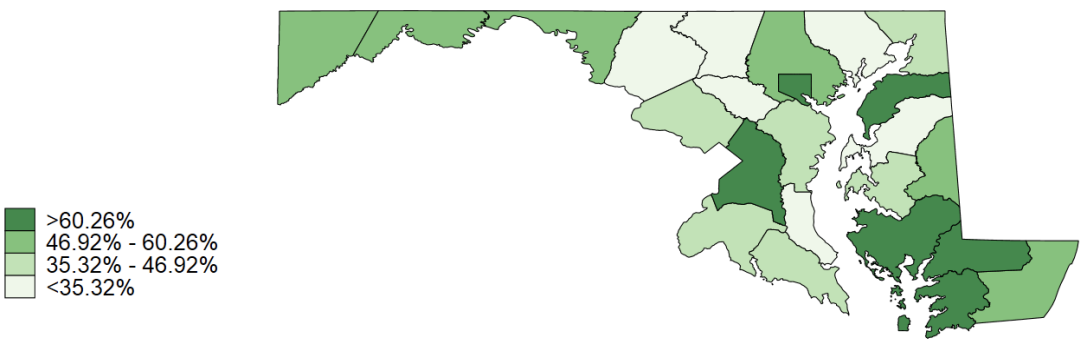
Low-income students

The measure used to identify low-income students is the school-level percentage of students eligible for free- and/or reduced-price lunch reported in the MSDE attendance files. Eligibility for free- or reduced-price lunches is determined by a student's family income and size, though students may be "categorically eligible" if enrolled in other federal assistance programs.[40]

In recognition of the new limitations on this measure resulting from the Community Eligibility Program, the cost function accounts for whether or not a school is participating in this program.

[40] More information on this program and eligibility requirements can be accessed from: https://fns-prod.azureedge.net/sites/default/files/cn/NSLPFactSheet.pdf.

Exhibit 4-14. Map of LSS Percent of Economically Disadvantaged Students, 2017-18



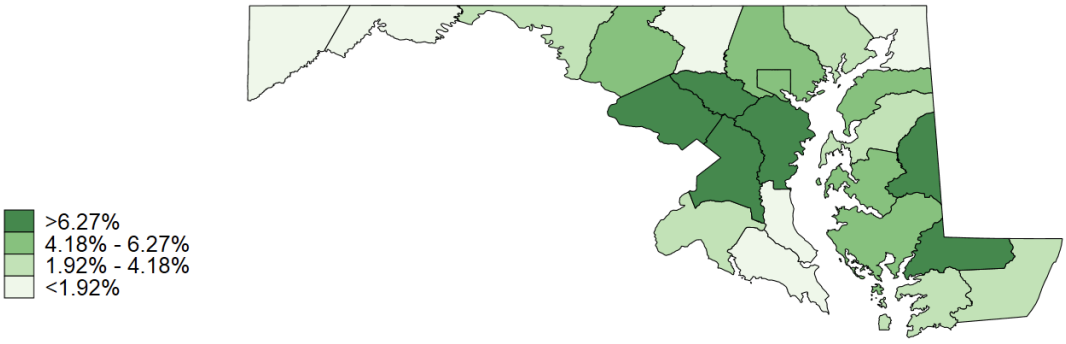
Source: MSDE, End-of-Year Attendance Files, SY 2014–2018.

English Learner Students

In Maryland, English learners are identified through a two-step process. First, the student's Home Language Survey must indicate a language other than English. Any student for whom this is the case must then be assessed on a state-approved English-language proficiency assessment. A student found to be limited in any domain of English proficiency is identified as an English learner.

Exhibit 4-15 displays the geographic variation in the district-level percent of English learners in the most recent year of data, 2017–18.

Exhibit 4-15. Map of LSS percent of English Learner students, 2017-18



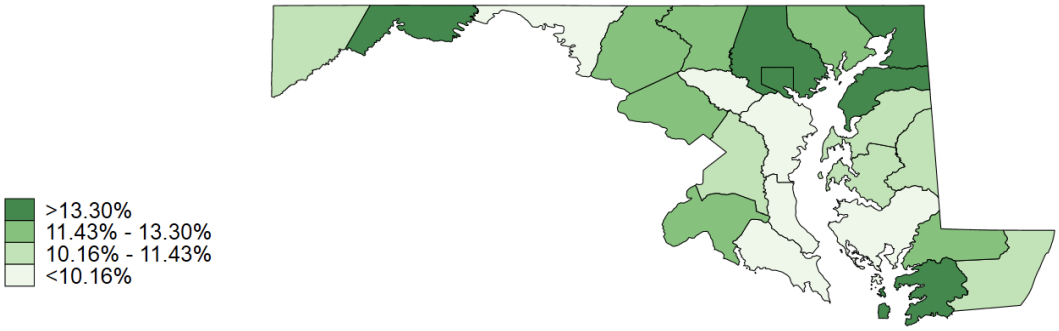
Source: MSDE, End-of-Year Attendance Files, SY 2014–2018.

Students with IEPs

Overall Population

The process of identifying students with disabilities is detailed elsewhere in this report. In the cost function, the MSDE attendance files were used to identify these students. Exhibit 4-16 displays the geographic variation in the district-level percent of students with IEPs in the most recent year of data, 2017–18.

Exhibit 4-16. Map of LSS percent of students with IEPs, 2017-18

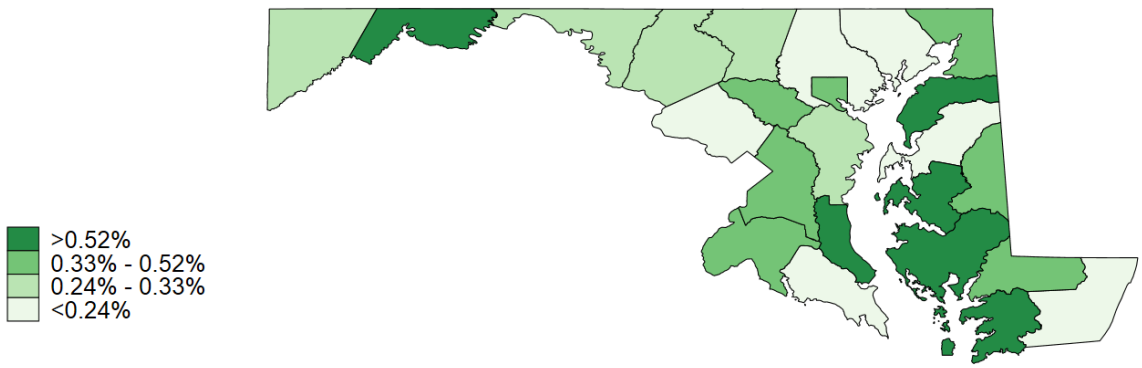


Source: MSDE, End-of-Year Attendance Files, SY 2014–2018.

Student Disability Categories

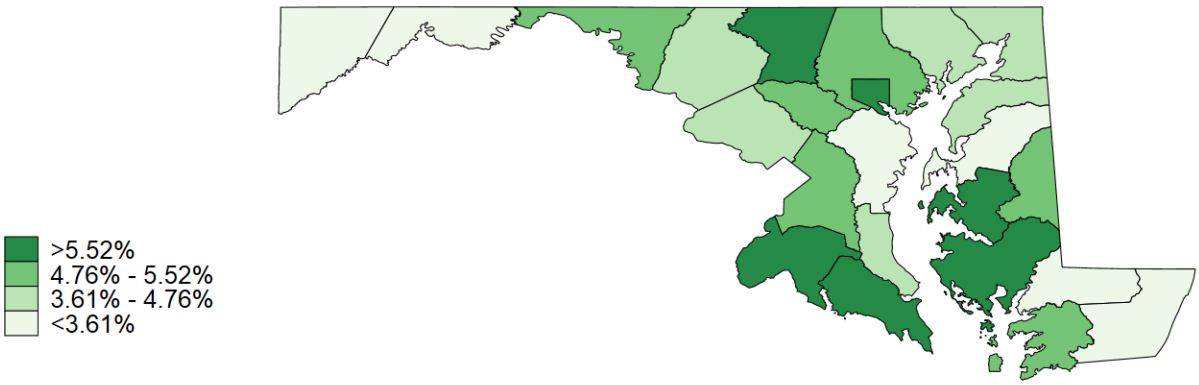
In addition to capturing the overall population of students with IEPs, the cost function model includes the composition of these students in a given school with respect to disability categories grouped into four overarching categories. The construction of these super-categories was based on the results of the cost function analysis and organized based on the magnitude of the effect of changes in the size of each category population on estimated costs. Specifically, this includes the following categories (1) Highest Cost, (2) High Cost, (3) Medium Cost, and (4) Low Cost. The exhibits below illustrate how the size of this population, *within students with disabilities*, varies by district.

Exhibit 4-17. Map of LSS percent of students with IEPs in the "highest cost" category, 2017-18



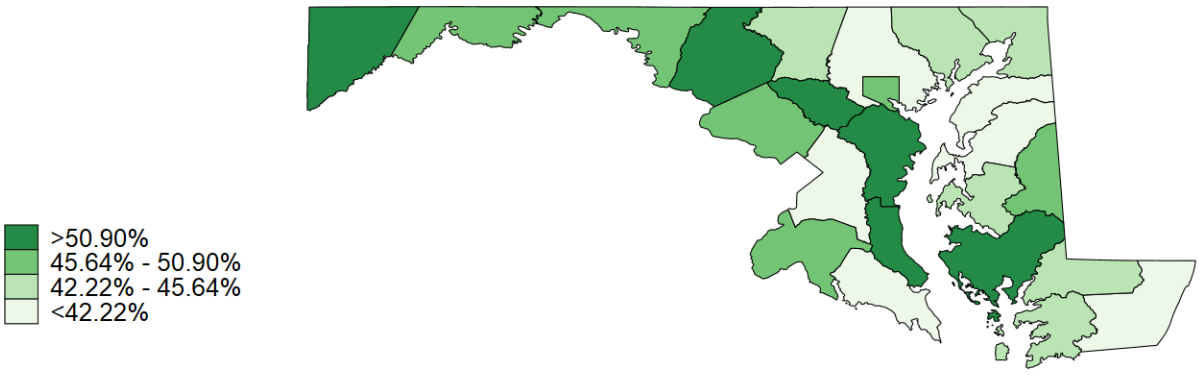
Sources: MSDE, Maryland Online Individualized Education Program (MOIEP) Data, SY 2015–2019; Baltimore County Public Schools, Online Individualized Education Program (OIEP) Data, 2017-18 school year; Anne Arundel County Public Schools, OIEP Data, 2017-18 school year; Howard County Public Schools, OIEP Data, 2017-18 school year; Wicomico County Public Schools, OIEP Data, 2017-18 school year.

Exhibit 4-18. Map of LSS percent of students with IEPs in the "high cost" category, 2017-18



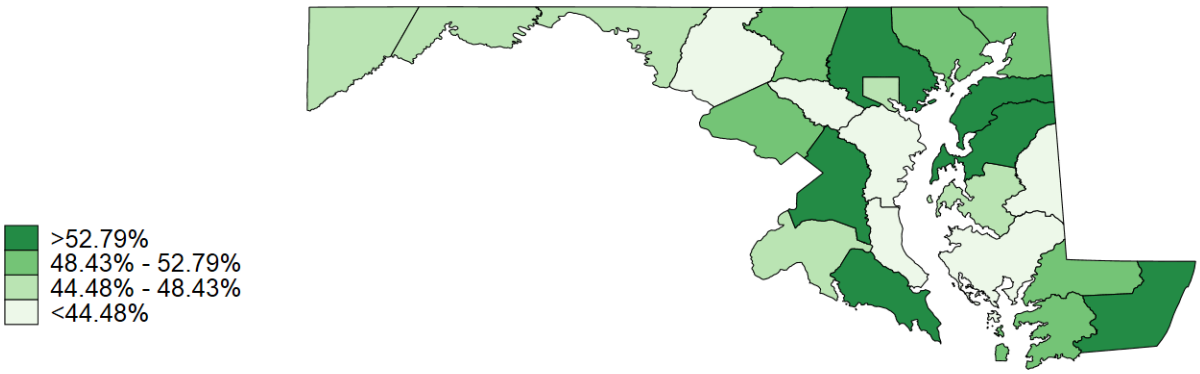
Sources: MSDE, Maryland Online Individualized Education Program (MOIEP) Data, SY 2015–2019; Baltimore County Public Schools, Online Individualized Education Program (OIEP) Data, 2017-18 school year; Anne Arundel County Public Schools, OIEP Data, 2017-18 school year; Howard County Public Schools, OIEP Data, 2017-18 school year; Wicomico County Public Schools, OIEP Data, 2017-18 school year.

Exhibit 4-19. Map of LSS percent of students with IEPs in the "medium cost" category, 2017-18



Sources: MSDE, Maryland Online Individualized Education Program (MOIEP) Data, SY 2015–2019; Baltimore County Public Schools, Online Individualized Education Program (OIEP) Data, 2017-18 school year; Anne Arundel County Public Schools, OIEP Data, 2017-18 school year; Howard County Public Schools, OIEP Data, 2017-18 school year; Wicomico County Public Schools, OIEP Data, 2017-18 school year.

Exhibit 4-20. Map of LSS percent of students with IEPs in the "low cost" category, 2017-18



Sources: MSDE, Maryland Online Individualized Education Program (MOIEP) Data, SY 2015–2019; Baltimore County Public Schools, Online Individualized Education Program (OIEP) Data, 2017-18 school year; Anne Arundel County Public Schools, OIEP Data, 2017-18 school year; Howard County Public Schools, OIEP Data, 2017-18 school year; Wicomico County Public Schools, OIEP Data, 2017-18 school year.

Academic Need Measure

As described in earlier sections, prior research into the resource needs of students with IEPs suggest that these needs vary substantially within disability categories. This points to the value of another measure of student need within students with IEPs that complements disability category. The researchers'

approach to identifying this measure begins with the areas of need identified as part of the Present Levels of Academic Achievement and Functional Performance section of the IEP form. The researchers believe these areas are the best IEP-based proxy for a student's innate level of need. However, with so many different areas, a method was sought by which the data into components of an underlying construct could be reduced, or multi-faceted trait or characteristic defined by the interactions of its components. This led to Exploratory Factor Analysis (EFA).

EFA is a statistical procedure used to discover unobserved (latent) constructs. Among the information available on a student's IEP, there is likely a network of relationships between designations. However, there may be specific designations, or areas of need, that map to a single latent construct, and the number of these areas may be as many as needed to fully explain the construct. EFA allows for us to explore, statistically, whether observed IEP-based components relate enough to point to an underlying construct of student need.[41] Also, importantly, EFA may be used to estimate a continuous level of need within an identified construct. An example of this might be the identification of five areas that all point to latent needs in the broad area of "communication," and based on identification in some combination of these five areas, a level of "communication" need would be estimated. The researchers employed EFA to understand if such a measure could be estimated with the data available.

As noted in Conclusion 2.5.3, EFA proved a formidable method of investigating constructs that exist within the IEP-based needs assessment. The primary challenge stemmed from the inconsistency with which areas of need are identified. EFA relies on having enough information (i.e., variance) to identify trends across individual designations. While the IEP data provides many possible areas of need, districts do not always use the same language to describe areas, creating challenges with identifying trends across districts. Moreover, there is no indication in any district of the *extent or severity* of need within specific areas. Such additional information would facilitate identifying multi-faceted, unobserved traits. Finally, in a couple of large districts, areas are commonly identified within very broad descriptions (e.g., "math", "reading", etc.), and thus in those districts, even less information is available.

Given the limitations, the researchers sought a way to draw on as much information as possible and mitigate the challenges described. Since districts using the state online IEP system (MOIEP) consistently identified areas of need, the researchers began by conducting a factor analysis within just those districts. Additionally, given challenges with available data, the researchers chose to conduct the initial analysis within the common broad domains (e.g., "Academic", "Physical", etc.). This first approach yielded some reliable findings, but in general, it was unsuccessful. The results were, however, fairly robust. The research team employed two independent approaches to conducting the analysis, resulting in very similar findings. These were namely that EFA was only an effective tool for areas within the "Academic" domain, and that a few particular areas tended to cluster together onto what might be described as "core academic needs."

[41] EFA can also be used to examine relationships *between* constructs. For example, is there an association between "speech and language skills" and "writing skills"? The possibility of this sort of cross-construct association was incorporated into our analysis.

While helpful, the results of this initial approach could not be replicated with all districts given the inconsistencies described. Thus, the initial results could only be used to inform a new approach to identifying trends within areas of need. Using these results as a guide, the researchers sought to identify three super-categories of need in the broad areas of Math, Reading, and Writing. A series of internal reliability tests (i.e., coefficient alpha) were computed to explore the combination of areas that could be attributed to each super-category. If an item would increase the alpha coefficient when removed from the test of internal reliability, then it was not considered for the super-category construction. The researchers began with areas of need that signaled, based on their name, an association with the overall super-category, and pared the groups down from there.

As with the initial analysis, this was done first within the MOIEP districts only. As described earlier, the non-MOIEP districts tend to use broad area names for each of these super-categories, identifying a student for "Reading" for example. So, once the iterative internal reliability test was complete, the non-MOIEP broad areas were added to their respective groups.

This process yielded the following subset of areas identified for each category, displayed in Exhibit 4-21.

Exhibit 4-21. IEP areas of need by super-category

Math
Math Calculation, Math Problem Solving, and Math (non-MOIEP)
Reading
Reading Comprehension, Reading Phonics, Reading Fluency, and Reading (non-MOIEP)
Writing
Written Language Expression, Language and Literacy, and Writing/Written (non-MOIEP)

As a test of the extent to which super-categories point to latent "core academic" needs, the super-categories were then tested in a factor analysis. All items successfully mapped to one latent trait, and the common testing criteria were generally sufficient:

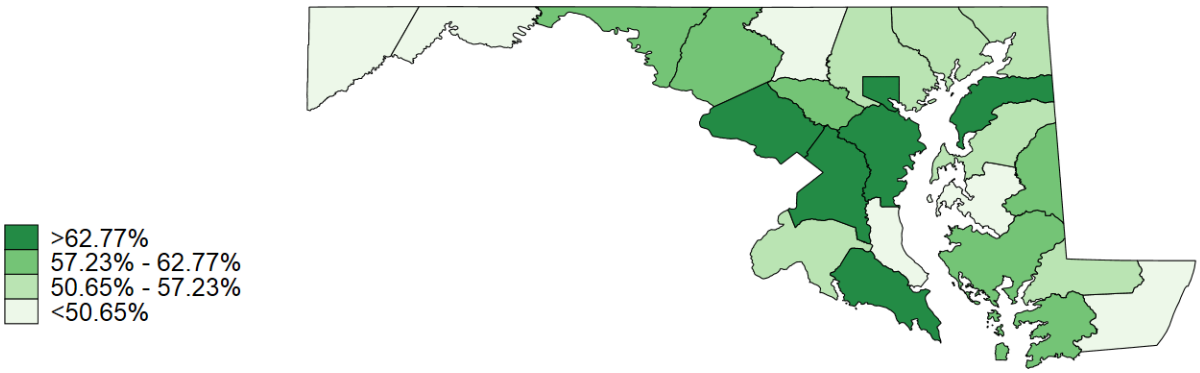
- Only one eigen value exceeded one, with a value of 2.06.
- All factor loadings exceeded 0.40, with the lowest loading at 0.5911.
- The internal reliability test was strong, with an alpha coefficient of 0.7092.

Notwithstanding these results, an effort was made to test factor scores based on this analysis in the cost function model, but ultimately the scores did not improve the model. However, the underlying super-

categories of areas of need do generally improve the overall cost model when entered as the school-level percentage of students identified with at least one area in a given category. However, there was strong enough collinearity between the Math and Reading measures to call for combining them into one unduplicated category. In sum, the inclusion of the school-level proportion of students with IEPs with at least one area in the Math or Reading super-category (or both), and the corresponding proportion of students in the Writing category, improved the cost model and were incorporated in our final cost estimates and recommended weights.

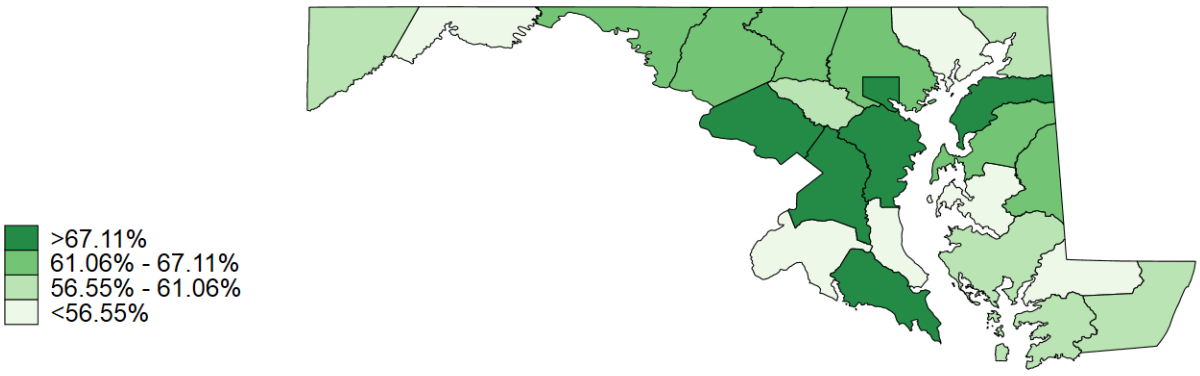
The exhibits below illustrate the variation in the percentage of students in each super-category of academic need at the district level. Unsurprisingly, the maps for Math and Reading appear quite similar, while Writing is more distinct.

Exhibit 4-22. Variation in Math Student Need by Goals and Progress Measures, 2018



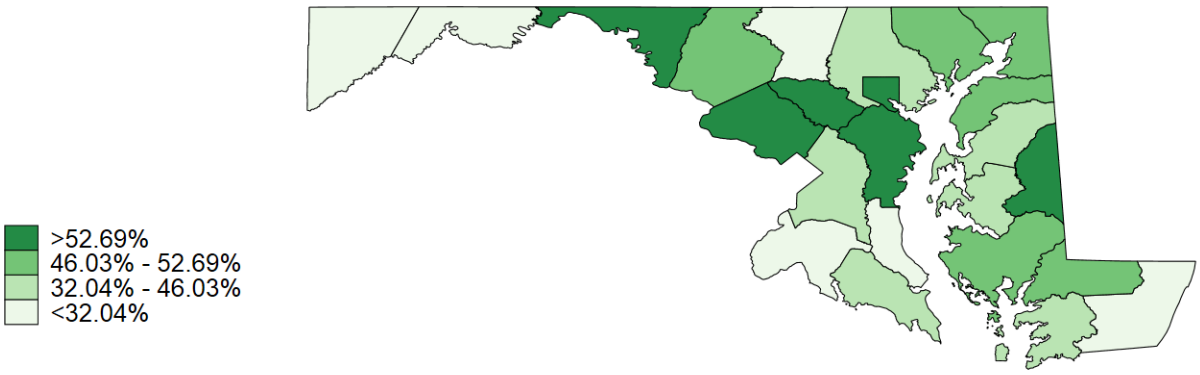
Source: Authors' calculations based on cost function model analysis

Exhibit 4-23. Variation in Reading Student Need by Goals and Progress Measures, 2018



Source: Authors' calculations based on cost function model analysis

Exhibit 4-24. Variation in Writing Student Need by Goals and Progress Measures, 2018



Source: Authors' calculations based on cost function model analysis

Middle School, High School, and Other School Indicators

Finally, to allow for the possibility that the education technology differs according to the grade level of the school, the cost model includes indicators for whether or not the school serves middle grades (i.e., grades 6–8), whether or not the school serves high school grades (i.e., grades 9–12), and whether or not

a school served an atypical range of grades (i.e., "Other" schools). These variables were included to account for unique, systematic differences in these communities that can't be controlled for directly.

Efficiency Factors and Heteroskedasticity

The error terms for all frontier specifications depend on a number of factors that theory suggests may explain differences in school efficiency. The one-sided variance function is modeled as a linear combination of six variables falling into two general categories: competition and community voter monitoring and anticipated unexplained spending. It is important to note that inefficiency should be interpreted as unexplained expenditures in excess of the minimum and not necessarily as wasteful expenditures.

Competition and Community Monitoring

Prior research has demonstrated that competition can reduce inefficiency in public education (e.g., Belfield & Levin, 2002; Millimet & Collier, 2008; Gronberg, Jansen, Karakaplan, & Taylor, 2015) and so can ease of voter monitoring (Grosskopf, Hayes, Taylor, & Weber, 2001). Therefore, three variables are included as efficiency factors under the first category, competition and community monitoring — the degree of educational competition in the metropolitan area or county; the percentage of the population with at least a bachelor's degree; and the percentage of households wherein at least one resident is over 60 years of age. These three variables were also treated as efficiency factors in Duncombe and Yinger (2005). Also included was a squared term for the latter two measures: percentage over 60 and percentage with at least a bachelor's degree.

Anticipated Unexplained Spending

In the final category of efficiency factors, anticipated unexplained spending, was the school-level percent of students with IEPs served in a Private Separate Day School (LRE Category G). The inclusion of this measure is to account for the possible impact on spending efficiency as the size of this relatively small population grows. The researchers find in fact that the larger this proportion of students is, the more efficient spending is.

Heteroskedasticity

Heteroskedasticity in the two-sided error may also arise. To capture such a possibility, the two-sided variance is modeled as a function of the share of building expenditures that was not specifically allocated to the building by the expenditures file. This variable has been included because measurement error in the dependent variable (a common source of heteroskedasticity) is likely to be a function of the extent to which the dependent variable was imputed. Likewise, the percentage of students tested in a given school has been included. This is because as the percentage of students tested goes down, one

would expect more measurement error in the key independent variable, our measure of academic growth.[42]

Instrumental Variables

The key to implementing the control function correction is the identification of viable instruments for school quality and school size. Viable instruments for school quality and size are well correlated with quality or size and not correlated with school expenditures *except through their relationship with quality or size*.

Human capital theory suggests that local labor market conditions can influence the demand for educational quality and the opportunity cost of staying in school, so, as in Gronberg, Jansen, Karakaplan, and Taylor (2015) and Gronberg, Jansen, and Taylor (2017), this analysis uses labor market conditions in the vicinity of the building as instruments for the Conditional NCE scores and graduation rates. The indicators of labor market conditions — the percent of employers in the construction industry and the percent of white-collar workers in the building ZIP code, the county chronic unemployment rate, the district-level post-secondary dropout rate,[43] — reflect the availability of the types of jobs most commonly held by workers with a high and low educational attainment. The percent of white collar workers might also reflect the demand for school quality relative to this population of workers. These data come from the ZIP Business Patterns and the American Community Survey, both produced by the U.S. Census Bureau.

The set of instrumental variables also includes a measure of the likely demand for educational services in the community — the interaction between the high school indicator and the percentage of community members with at least a bachelor's degree, and the distance in miles to the nearest residential Maryland Association Nonpublic Special Education Facilities (MANSEF) locations. The former may also reflect labor market conditions. The latter of these reflects the theory that the proximity of a nonpublic, residential facility offers an educational alternative and thus impacts demand.

In addition, the model also includes an instrument for school size — population density and density interacted with the high school indicator. This reflects that in densely populated areas, school size can be optimized more easily than in sparsely populated areas.

[42] By assumption, the one-sided error term has a half-normal distribution. Jensen and Uwe (2005) find that specifying a half-normal distribution for the inefficiency term generates more reliable estimates of technical efficiency than other assumptions about the distribution of inefficiency.

[43] This rate was measured as the percentage of the community that failed to complete high school. This variable also comes from the American Community Survey.

Results

Exhibit 4-25 describes the first-stage independent variable coefficient estimates, along with the standard errors. As the exhibit illustrates, the instrumental variables are well correlated with the outcome measures; the first stage F-statistics are 13.2, 10.3, 51.4, 203.7 and 15.2 for the average IEP goals progress, Conditional NCE, special education graduation rate, non-special education graduation rate, and school enrollment, respectively.

Exhibit 4-25. First-Stage Coefficient Estimates

-	(1)	(2)	(3)	(4)	(5)
Variable Name	IEP Goals Progress	All Student NCE	SPED Graduation Rate	non-SPED Graduation Rate	Campus Enrollment
District Enrollment	–0.0162*	0.0508	-0.0097	–0.0362	0.3637
-	(0.009)	(0.035)	(0.057)	(0.026)	(0.250)
District Enrollment Squared	0.0007*	–0.0024	0.0008	0.0014	–0.0168
-	(0.000)	(0.002)	(0.003)	(0.001)	(0.012)
Salary Index (log)	–0.2139***	-0.0870	0.0942	0.1672***	1.2153*
-	(0.024)	(0.094)	(0.156)	(0.056)	(0.643)
Salary Index (log)	0.5574***	–0.0544	–0.9164**	–0.5029***	–1.6073
-	(0.057)	(0.219)	(0.380)	(0.141)	(1.538)
Miles to the Nearest Metro or Micro Area	–0.0002	–0.0003	0.0015*	0.0015***	–0.0190***
-	(0.000)	(0.001)	(0.001)	(0.000)	(0.005)
Miles to the Nearest Metro or Micro Area, sq.	–0.0000**	0.0000	–0.0000	–0.0000***	0.0004***
-	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Percent Eligible for Free Lunch	0.0031	–0.1584***	0.0053	0.0156	–0.1513
-	(0.004)	(0.017)	(0.023)	(0.011)	(0.123)
Percent Eligible for Free Lunch, sq.	–0.0010	0.0744***	–0.0201	–0.0348***	–0.0018
-	(0.003)	(0.017)	(0.022)	(0.011)	(0.119)

-	(1)	(2)	(3)	(4)	(5)
Variable Name	IEP Goals Progress	All Student NCE	SPED Graduation Rate	non-SPED Graduation Rate	Campus Enrollment
Percent ELL (District Level)	–0.0035	0.0222	–0.1399***	–0.1799***	1.1737***
-	(0.006)	(0.026)	(0.036)	(0.022)	(0.194)
Percent ELL (District Level), sq.	0.0060	0.0900**	0.2580***	0.2909***	–0.7542**
-	(0.009)	(0.046)	(0.058)	(0.036)	(0.320)
Percent of Special Education Students	0.9171***	–0.0329	–0.0087	0.2119***	–0.8837
-	(0.023)	(0.076)	(0.112)	(0.068)	(0.583)
Percent of Special Education Students, sq.	–0.1011	0.1338	0.2243	–0.5813***	–3.4971**
-	(0.082)	(0.222)	(0.341)	(0.214)	(1.626)
Percent of Special Education Students*Middle School	–0.0338**	–0.1660***	–0.0076	0.0058	–0.8835**
-	(0.014)	(0.050)	(0.051)	(0.029)	(0.401)
Percent of Special Education Students*High School	–0.0326	–0.1329	–0.6782***	–0.3667***	–2.4503***
-	(0.023)	(0.088)	(0.256)	(0.138)	(0.589)
Middle School Indicator	0.0053***	0.0145**	–0.0144**	–0.0060	0.5546***
-	(0.002)	(0.007)	(0.007)	(0.004)	(0.052)
High School Indicator	0.0122***	0.1203***	0.0497	0.0412**	1.6731***
-	(0.003)	(0.015)	(0.041)	(0.016)	(0.108)
Other School Indicator	–0.0047	–0.0557***	0.0876**	–0.0007	0.2029***

-	(1)	(2)	(3)	(4)	(5)
Variable Name	IEP Goals Progress	All Student NCE	SPED Graduation Rate	non-SPED Graduation Rate	Campus Enrollment
-	(0.004)	(0.010)	(0.034)	(0.017)	(0.069)
Year_n==2017	0.0013***	–0.0013	0.0047*	0.0061***	–0.0017
-	(0.000)	(0.002)	(0.003)	(0.001)	(0.013)
Year_n==2018 (Omitted)	-	-	-	-	-
-					
Community Eligibility Indicator	0.0028**	–0.0090	–0.0107	0.0098**	0.0058
-	(0.001)	(0.007)	(0.008)	(0.005)	(0.035)
Baltimore City and County School Districts Indicator	0.0176***	–0.0034	0.0647***	0.0246***	0.0675
-	(0.002)	(0.008)	(0.015)	(0.006)	(0.062)
Washington-Arlington-Alexandria Metro Area	0.0124***	–0.0283***	0.0219**	–0.0266***	0.1484***
-	(0.002)	(0.007)	(0.010)	(0.005)	(0.048)
Baltimore-Columbia-Towson Metro Area	0.0067***	–0.0437***	–0.0348***	–0.0280***	0.1380***
-	(0.002)	(0.006)	(0.009)	(0.005)	(0.046)
Percent of Highest-Cost Disabilities	–0.1349***	0.0842	0.1017	0.1233	–4.4864***
-	(0.035)	(0.138)	(0.204)	(0.114)	(1.237)
Percent of High-Cost Disabilities	–0.0092*	–0.0408**	–0.0198	–0.0210	0.1711
-	(0.005)	(0.018)	(0.025)	(0.013)	(0.140)
Percent of Medium-Cost Disabilities	0.0060***	–0.0138*	–0.0553***	–0.0002	0.2322***

-	(1)	(2)	(3)	(4)	(5)
Variable Name	IEP Goals Progress	All Student NCE	SPED Graduation Rate	non-SPED Graduation Rate	Campus Enrollment
-	(0.002)	(0.008)	(0.011)	(0.005)	(0.057)
Percent of Students with Writing Academic Need in Highest-Cost Disabilities	–0.0043***	–0.0039	0.0043	0.0027	0.0427
-	(0.001)	(0.005)	(0.008)	(0.004)	(0.031)
Percent of Students with Reading or Math Academic Need in Highest-Cost Disabilities	0.0044***	0.0006	–0.0028	–0.0068	0.1833***
-	(0.001)	(0.004)	(0.007)	(0.004)	(0.029)
Percent of Students with Writing Academic Need in High-Cost Disabilities	0.0007	0.0008	–0.0015	0.0003	0.0293
-	(0.001)	(0.003)	(0.004)	(0.002)	(0.022)
Percent of Students with Reading or math academic need in high-cost disabilities	–0.0003	–0.0050	0.0014	0.0017	0.1032***
-	(0.001)	(0.003)	(0.004)	(0.002)	(0.021)
Percent of Students with Writing Academic Need in Medium-Cost Disabilities	–0.0032**	0.0089	0.0043	0.0106***	–0.0774*
-	(0.001)	(0.006)	(0.008)	(0.004)	(0.041)
Percent of Students with Reading or Math Academic Need in Medium-Cost Disabilities	0.0001	–0.0134**	–0.0072	–0.0036	0.0051
-	(0.001)	(0.005)	(0.007)	(0.003)	(0.040)
Percent of Students with Writing Academic Need in Low-Cost Disabilities	0.0013	–0.0000	–0.0178**	–0.0018	0.0486

-	(1)	(2)	(3)	(4)	(5)
Variable Name	IEP Goals Progress	All Student NCE	SPED Graduation Rate	non-SPED Graduation Rate	Campus Enrollment
-	(0.002)	(0.006)	(0.007)	(0.003)	(0.044)
Percent of Students with Reading or Math Academic Need in Low-Cost Disabilities	–0.0039	-0.0120	0.0049	0.0276***	0.0588
-	(0.003)	(0.010)	(0.016)	(0.007)	(0.106)
District-level Percent White Collar Workers	–0.0016	0.0153	0.0458***	0.0195**	0.2196***
-	(0.003)	(0.010)	(0.016)	(0.008)	(0.080)
Miles to the Nearest MANSEF Residential Facility Program	0.0001***	–0.0001	0.0003	0.0003***	0.0007
-	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Population Density*High School Indicator	–0.0000***	–0.0000	0.0000*	–0.0000*	0.0001**
-	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
County Chronic Unemployment Rate*High School Indicator	–0.0013*	–0.0233***	0.0033	0.0003	–0.1122***
-	(0.001)	(0.004)	(0.010)	(0.004)	(0.028)
Population Density	–0.0000***	0.0000*	–0.0000***	–0.0000***	–0.0001***
-	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Percent College Degree*High School Indicator	0.0090***	0.0063	–0.0083	0.0169***	0.1149***
-	(0.001)	(0.004)	(0.007)	(0.004)	(0.037)
District-level Post-Secondary Dropout Percent sq	0.4546***	–0.5430	–0.4540	–3.7514***	1.2987

-	(1)	(2)	(3)	(4)	(5)
Variable Name	IEP Goals Progress	All Student NCE	SPED Graduation Rate	non-SPED Graduation Rate	Campus Enrollment
-	(0.090)	(0.365)	(0.750)	(0.395)	(3.169)
Number of Construction Establishments (by zip code)	–0.0000	0.0000	0.0001***	0.0000**	0.0010***
-	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
County Chronic Unemployment Rate	0.0004	–0.0040*	–0.0291***	–0.0127***	0.0636***
-	(0.001)	(0.002)	(0.006)	(0.002)	(0.016)
Constant	0.0938**	0.3915**	0.8996***	1.1893***	3.5651***
-	(0.045)	(0.174)	(0.272)	(0.133)	(1.256)
Observations	2,326	2,326	2,326	2,326	2,326
R-squared	0.947	0.412	0.536	0.841	0.646

Source: Authors' calculations based on cost function model analysis

Exhibit 4-26 presents four versions of the cost function coefficients. The first model is the preferred specification and the one on which our recommendations are based. The other three specifications are presented to demonstrate that certain types of schools or districts or modeling choices are not driving the results. This includes a model (Model 2) excluding districts with small enrollments; a model (Model 3) in which schools with nontraditional grade configurations are excluded; and a model (Model 4) in which different choices are made with respect to controlling for student need within students with disabilities. These different choices include using all disability categories to control for composition as opposed to the four categories developed by the researchers. It also includes the academic need variables on their own as opposed to nested within the disability categories as in the primary specification.

As the exhibit illustrates, these alternative specifications yield coefficient estimates that are very similar to those from the complete specification (Model 1). The coefficient estimates suggest that the cost function aligns with reasonable expectations about school district costs. In all cases, increases in NCE growth scores and IEP progress averages are associated with higher costs. The relationship between cost and the special education graduation rate is not statistically significant suggesting that variations in these rates (which reflect the cumulative impact of more than 12 years of formal education) are not captured well in a single year of school expenditures. Costs per pupil are a decreasing function of school and district enrollments, but an increasing function of the Comparable Wage Index (CWI). Costs are higher in remote locations. Costs are a nonlinear function of student need, but generally rise with student need.

Exhibit 4-26. Cost Model Coefficient Estimates

Variable Name	(1)	(2)	(3)	(4)
Stochastic Frontier				
All Student NCE	2.776***	2.240***	2.450***	3.100***
-	(0.553)	(0.523)	(0.556)	(0.562)
All Student NCE sq.	–1.016**	–1.018**	–0.663	–0.861*
-	(0.461)	(0.457)	(0.467)	(0.473)
SPED IEP Goals Progress Pct	6.913***	8.044***	7.154***	5.326***
-	(1.525)	(1.685)	(1.520)	(1.762)
SPED IEP Goals Progress Pct sq.	–0.0219	–0.296	–0.164	–0.235
-	(0.722)	(0.734)	(0.717)	(0.722)
School-Level SPED Graduation Rate	0.105	0.0861	0.347	0.177
-	(0.252)	(0.245)	(0.228)	(0.240)
School-Level SPED Graduation Rate sq	–0.0956	–0.0933	–0.282*	–0.131
-	(0.187)	(0.181)	(0.168)	(0.176)
School-Level Non-SPED Graduation Rate	18.20***	17.34***	18.03***	14.59***
-	(4.803)	(5.060)	(5.615)	(5.255)
School-Level Non-SPED Graduation Rate sq	–25.48***	–24.26***	–25.44***	–20.07***
-	(6.055)	(6.382)	(6.970)	(6.569)

Variable Name	(1)	(2)	(3)	(4)
Stochastic Frontier				
School-Level Non-SPED Graduation Rate Cubed	11.42***	10.93***	11.46***	8.987***
-	(2.534)	(2.674)	(2.874)	(2.734)
School Membership	–0.0880	–0.277***	–0.0622	–0.280***
-	(0.104)	(0.0913)	(0.103)	(0.106)
School Membership sq	0.00180	0.0152**	–0.000811	0.00590
-	(0.00706)	(0.00632)	(0.00700)	(0.00730)
District Enrollment (log)	–0.170**	–0.172	–0.179**	–0.213***
-	(0.0721)	(0.128)	(0.0723)	(0.0739)
District Enrollment (log) sq	0.0108***	0.0112*	0.0112***	0.0132***
-	(0.00348)	(0.00603)	(0.00349)	(0.00357)
County-Level CWI-FT (log)	1.541***	1.760***	1.536***	1.389***
-	(0.263)	(0.307)	(0.260)	(0.318)
County-Level CWI-FT (log) sq	–3.318***	–3.966***	–3.307***	–2.632***
-	(0.643)	(0.747)	(0.642)	(0.806)
Miles to the Nearest MCSA	0.00485***	0.00480***	0.00503***	0.00166
-	(0.00141)	(0.00146)	(0.00141)	(0.00138)
Miles to the Nearest MCSA sq	–5.12e-05	–3.34e-05	–5.42e-05	–1.79e-05
-	(3.63e-05)	(3.67e-05)	(3.63e-05)	(3.52e-05)
School-Level Percent FARMS	0.468***	0.366***	0.479***	0.516***

Variable Name	(1)	(2)	(3)	(4)
Stochastic Frontier				
-	(0.0509)	(0.0433)	(0.0511)	(0.0499)
School-Level Percent FARMS sq	–0.259***	–0.214***	–0.265***	–0.271***
-	(0.0371)	(0.0350)	(0.0372)	(0.0374)
School-Level Percent LEP	–0.0315	0.0267	–0.0358	0.177***
-	(0.0661)	(0.0642)	(0.0648)	(0.0620)
School-Level Percent LEP sq	0.0963	0.109	0.0987	–0.176**
-	(0.0916)	(0.0871)	(0.0899)	(0.0873)
School-Level Percent SPED	–5.396***	–6.189***	–5.571***	–3.978***
-	(0.991)	(1.153)	(0.991)	(1.227)
School-Level Percent SPED sq	1.396***	1.370***	1.593***	0.600
-	(0.456)	(0.440)	(0.456)	(0.458)
Percent of Special Education Students*Middle School	0.409***	0.360***	0.404***	0.395***
-	(0.109)	(0.117)	(0.106)	(0.118)
Percent of Special Education Students *High School	1.170***	1.122***	1.098***	1.051***
-	(0.160)	(0.170)	(0.161)	(0.171)
Middle School Indicator	0.00269	0.0154	0.00733	0.0924***
-	(0.0219)	(0.0239)	(0.0214)	(0.0216)
High School Indicator	–0.0623	–0.0455	–0.0426	0.105***
-	(0.0401)	(0.0427)	(0.0393)	(0.0372)

Variable Name	(1)	(2)	(3)	(4)
Stochastic Frontier				
Other School Indicator	0.130***	0.106***		0.0469
-	(0.0307)	(0.0314)		(0.0509)
Year Dummy - 2017	–0.0305***	–0.0337***	–0.0307***	–0.0276***
-	(0.00367)	(0.00372)	(0.00367)	(0.00384)
Year Dummy - 2018 (Omitted)	-	-	-	-
-	-	-	-	-
Community Eligibility School Indicator	0.0422***	0.0505***	0.0408***	0.0505***
-	(0.00990)	(0.0102)	(0.00970)	(0.0101)
Baltimore City and County School Districts Indicator	–0.109***	–0.125***	–0.106***	–0.101***
-	(0.0186)	(0.0204)	(0.0187)	(0.0205)
Washington-Arlington-Alexandria Metro Area	–0.0580***	–0.0768***	–0.0619***	–0.0223
-	(0.0129)	(0.0140)	(0.0131)	(0.0141)
Baltimore-Columbia-Towson Metro Area	0.0237*	0.00598	0.0194	0.0599***
-	(0.0126)	(0.0121)	(0.0127)	(0.0124)
Percent of Highest-Cost Disabilities	1.669***	1.726***	1.633***	-
-	(0.275)	(0.291)	(0.269)	-
Percent of High-Cost Disabilities	0.280***	0.277***	0.275***	-
-	(0.0373)	(0.0385)	(0.0374)	-
Percent of Medium-Cost Disabilities	0.0307*	0.0210	0.0376**	-

Variable Name	(1)	(2)	(3)	(4)
Stochastic Frontier				
-	(0.0179)	(0.0184)	(0.0176)	-
Percent of Students with Writing Academic Need in Highest-Cost Disabilities	0.0325***	0.0329***	0.0334***	-
-	(0.00904)	(0.00952)	(0.00897)	-
Percent of Students with Reading or Math Academic Need in Highest-Cost Disabilities	–0.0552***	–0.0553***	–0.0549***	-
-	(0.00953)	(0.0109)	(0.00939)	-
Percent of Students with Writing Academic Need in High-Cost Disabilities	0.00280	0.00142	0.00325	-
-	(0.00575)	(0.00567)	(0.00570)	-
Percent of Students with Reading or Math Academic Need in High-Cost Disabilities	–0.00692	–0.00630	–0.00558	-
-	(0.00655)	(0.00630)	(0.00655)	-
Percent of Students with Writing Academic Need in Medium-Cost Disabilities	0.0223*	0.0304**	0.0209*	-
-	(0.0126)	(0.0123)	(0.0124)	-
Percent of Students with Reading or Math Academic Need in Medium-Cost Disabilities	0.0741***	0.0624***	0.0745***	-
-	(0.0104)	(0.00999)	(0.0104)	-
Percent of Students with Writing Academic Need in Low-Cost Disabilities	0.00700	0.00817	0.00733	-
-	(0.00980)	(0.00988)	(0.00980)	-
Percent of Students with Reading or Math Academic Need in Low-Cost Disabilities	–0.0752***	–0.0620***	–0.0731***	-
-	(0.0218)	(0.0233)	(0.0217)	-
Residuals - All NCE	–1.633***	–1.092***	–1.671***	–2.126***

Variable Name	(1)	(2)	(3)	(4)
Stochastic Frontier				
-	(0.247)	(0.190)	(0.248)	(0.236)
Residuals - IEP Progress	–7.381***	–8.079***	–7.460***	–5.410***
-	(0.999)	(1.205)	(1.015)	(1.305)
Residuals - Non-SPED Grad Rate	0.227*	0.152	0.229**	–0.138
-	(0.119)	(0.124)	(0.115)	(0.133)
Residuals - School Membership	–0.0815**	–0.0707**	–0.0737**	0.0578*
-	(0.0319)	(0.0315)	(0.0314)	(0.0300)
Other School Indicator = o,	-	-	-	-
-	-	-	-	-
Percent of Special Education Students*Other School	-	-	-	0.756***
-	-	-	-	(0.272)
School-level Percent Intellectual Disability (within SPED population)	-	-	-	0.146**
-	-	-	-	(0.0672)
School-level Percent Hearing Impairment (within SPED population)	-	-	-	0.291***
-	-	-	-	(0.0979)
School-Level Percent Speech or Language Impairment (within SPED population)	-	-	-	0.0479
-	-	-	-	(0.0446)
School-Level Percent Visual Impairment (within SPED population)	-	-	-	–0.276
-	-	-	-	(0.252)

Variable Name	(1)	(2)	(3)	(4)
Stochastic Frontier				
School-Level Percent Emotional Disability (within SPED population)	-	-	-	0.363***
-	-	-	-	(0.0490)
School-Level Percent Orthopedic Impairment (within SPED population)	-	-	-	1.028***
-	-	-	-	(0.263)
School-Level Percent Other Health Impairment (within SPED population)	-	-	-	0.0234
-	-	-	-	(0.0424)
School-Level Percent Specific Learning Disability (within SPED population)	-	-	-	–0.0264
-	-	-	-	(0.0431)
School-Level Percent Multiple Disabilities (within SPED population) - OMITTED = o,	-	-	-	-
-	-	-	-	
School-Level Percent Traumatic Brain Injury (within SPED population)	-	-	-	0.597*
-	-	-	-	(0.333)
School-Level Percent Autism (within SPED population)	-	-	-	0.123**
-	-	-	-	(0.0550)
School-Level Percent Developmental Delay (within SPED population)	-	-	-	0.116**
-	-	-	-	(0.0470)
School-Level Percent Academic Need - Reading (within SPED population)	-	-	-	0.0402*
-		-	-	(0.0215)
School-Level Percent Academic Need - Writing (within SPED population)		-	-	0.0257**

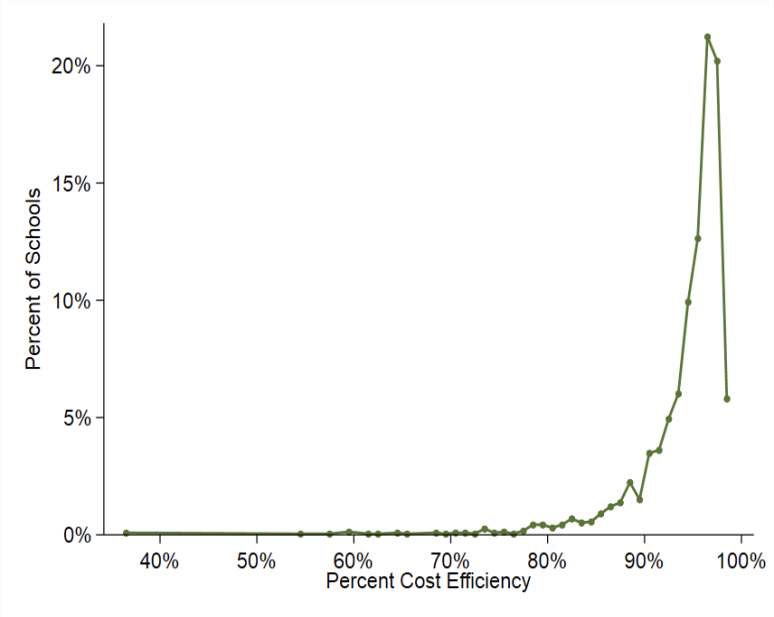
Variable Name	(1)	(2)	(3)	(4)
Stochastic Frontier				
-	-	-	-	(0.0115)
Constant	4.720***	5.810***	4.807***	6.270***
-	(1.278)	(1.521)	(1.501)	(1.405)
Two-Sided Error				
Indicator for Monopoly CBSA	–1.827***	–2.501***	–2.359***	–2.361***
-	(0.370)	(0.706)	(0.407)	(0.375)
District-Level Percent of Households with at least One Person Over 60	–85.16***	–96.78***	–92.64***	–97.07***
-	(18.02)	(21.00)	(18.63)	(17.76)
District-Level Percent of Households with at least One Person Over 60 sq	113.1***	127.3***	122.7***	128.1***
-	(20.87)	(24.01)	(21.38)	(20.45)
District-Level Percent with a College Degree	–20.67***	–30.76***	–17.11**	–26.04***
-	(6.900)	(11.43)	(7.462)	(7.129)
District-Level Percent with a College Degree sq	23.15***	34.17***	19.53**	28.22***
-	(7.649)	(12.49)	(8.271)	(7.877)
School-Level Percent Private Separate Day School - LRE G (within SPED population	10.76	11.69	10.25	15.76*
-	(8.245)	(8.308)	(8.377)	(8.184)
Constant	14.64***	19.15***	15.25***	18.28***
-	(4.048)	(4.207)	(4.089)	(3.980)

Variable Name	(1)	(2)	(3)	(4)
Stochastic Frontier				
One-Sided Error				
School Percent Expenditures Allocated to Schools	2.436	1.573	2.569	1.668
-	(1.696)	(1.880)	(1.612)	(1.792)
School Percent of Students Tested	–0.132	–0.0216	–0.174	–0.246
-	(0.207)	(0.211)	(0.199)	(0.215)
Constant	–6.536***	–6.363***	–6.528***	–6.250***
-	(0.563)	(0.624)	(0.532)	(0.586)
Observations	2,326	2,258	2,301	2,326

Source: Authors' calculations based on cost function model analysis

Overall, schools in Maryland are generally efficient; on average, about 94.14% of spending is explained by the model. However, there are a handful of schools (~1%) with cost efficiency as low as 73.5% or less. Exhibit 4-27 displays the distribution of cost efficiency estimated by the model in the most recent year of data, 2017-18.

Exhibit 4-27. Cost Model Coefficient Estimates



Source: Authors' calculations based on cost function model analysis

Adequacy Calculations

One calculates the costs associated with various performance standards by using the coefficient estimates in Exhibit 4-28 to predict the expenditures associated with the designated performance metrics and the observed characteristics of schools and districts. Such calculations are very straightforward, but require making decisions about (1) the minimum performance thresholds (i.e., for the investment scenarios for Short-term A, B, and C), and (2) how to define the annual academic growth required to continually meet the state's obligation under the definition of adequacy in Maryland (i.e., for the investment scenarios for Ongoing A and B).

In particular, one should carefully consider the options for maintaining annual growth for students with disabilities (determining the ongoing investments). One could interpret Maryland's obligation as providing resources sufficient to ensure all students with disabilities achieve average academic growth annually (Ongoing A). This is a minimum standard that does not maintain investments to students currently growing at above-average rates continue to grow faster than average. Additional resources

would be required to ensure that all students achieve *at least* average annual growth and no students achieve less growth than they currently achieve (Ongoing B).

Under all assumptions about academic growth, special education graduation rates are held constant at the state ESSA goal for students with disabilities: 74.86%. This reflects our view that with respect to graduation rates, this is the most appropriate target. It is in line with state goals and would bring all schools above the 75th percentile in school-level graduation rates in the most recent year of data, 2017-18.

Also, under all assumptions, the average IEP goal progress measure is held at the current average, 91%, or students make sufficient progress on 91% of their goals on average. Though this reflects the fact that generally students with IEPs are making sufficient progress on their goals, in some cases performance is much lower. For ~5% of schools, average progress is 66.7% or lower. As is described in other sections, the expectation is that every goal will be achievable, and there are significant consequences for failing to even make sufficient progress. With this in mind, a goal of 91% is actually quite modest.

However, absent an independent standard for IEP goal progress, the researchers were hesitant to estimate costs for a more ambitious but more arbitrary target. Moreover, the complexity, and variance in what a student's individual goals actually are and what it takes to meet them has implications on the ability for a school to reach more ambitious targets for all students. Finally, given the ongoing work to improve the consistency of establishing and implementing IEP goals in Maryland, the researchers felt a modest goal was most appropriate.

Finally, it should also be noted that the cost model is agnostic of the time over which additional estimated spending is provided and any expectations about improvement in outcomes over time. The reported estimates represent spending associated with the assumed annual growth, controlling for all other factors in the model. Therefore, in an effort to provide policymakers with cost estimates of the most practical use and that fully acknowledge the limitations of the method, the researchers have not taken the step of simulating how achieving the different assumptions about academic growth consistently year-over-year would impact the overall level of performance in the state.

It should be noted that both scenarios were constructed by estimating the best practice among Maryland LSSs. Our approach allows for the possibility that districts could be spending more than would be strictly necessary to achieve their current levels of measured performance and removes any such district-specific "inefficient" spending from the cost projections. In this context, "inefficiency" refers to spending that does not contribute to the measured outcomes in the model (namely, academic growth). As such, inefficiency could include spending that simply contributes to unmeasured outcomes that are uncorrelated with academic growth (e.g., enrichment activities).

Short-term and Ongoing Investment Scenarios Based on Presumed Performance Threshold Assumptions

The researchers modeled a variety of scenarios — based on different thresholds for student performance — to produce a range of cost estimates for the state. Ultimately, the objective is to provide

an estimate of the additional investment required to reach a level of performance among students with disabilities not yet achieved statewide. Through the presentation of these short-term and ongoing investment scenarios, this study intends to provide the state with a range of options to consider with respect to reaching this higher level of performance. In constructing the cost estimates, it is assumed that both types of investments — short-term and ongoing — are coordinated to achieve the desired result. Such coordination requires that the state and LSSs create both monitoring tools and support mechanisms to ensure that current investments, and any future investments, are used effectively. It also requires that implementation occurs over time, creating an opportunity for LSSs and schools to plan for the necessary changes in their systems. For purposes of these scenarios, implementation is presumed to span ten years, which coincides with the timeline identified by the Kirwan Commission for the implementation of overall changes in the state's K-12 education system.

The short-term cost estimates use specific performance thresholds, i.e., set percentages of students achieving proficiency on the statewide ELA and Math assessments, as benchmarks for student performance. Once students requiring additional support have achieved this standard of performance — in conjunction with all other students already achieving at such a level — the ongoing investment scenarios use student growth thresholds to ensure all students maintain performance at grade level. Likewise, for scenarios, the researchers set a threshold for graduation rates among students with disabilities, and a threshold for average IEP goal progress.

Short-term Investment Scenarios

While the ongoing investment scenarios represent funding levels that would help to maintain the average annual growth of students, the short-term (ten years) investment scenarios represent the support necessary to enable performance gap reduction between lower-performing students with disabilities and their higher-achieving peers. In these investment scenarios, the cost estimates use absolute thresholds of performance to evaluate the necessary, differential growth needed for student populations that are currently not meeting proficiency (or standards) in Maryland. It is intended, as the name would suggest, that these investments are short-term in nature and are meant to support changes in the public school system that permanently alter the structures of schooling to enable all students in special education to meet the standard of an adequate education. There are three short-term scenarios for which estimates were created.[44]

In the first scenario ("Short-term A"), all students are projected to achieve average annual, grade-level growth, except for students in schools that are not currently meeting proficiency targets. Students not currently meeting proficiency targets are assigned growth levels that would allow these to achieve the proficiency rate outlined by Maryland's current Every Student Succeeds Act (ESSA) plan for students with disabilities. Under the state's ESSA plan, the state aims for students with disabilities to reach

[44] All three short-term scenarios take a simple approach to modeling the growth required to reach their respective targets. For each school, the standard deviation in academic performance is calculated based on the performance of all students. Then the minimum standard deviation increases among students with IEPs required to achieve the target rate of proficiency within this group is determined. Finally, the student growth necessary to achieve this increase in scores is calculated and averaged at the student level, again within the population of students with IEPs. This new school-level average growth is introduced into the model and is the basis for the estimates presented here. For additional details on this see Appendix 3.

proficiency levels of 55.5% in Math by the year 2030. For English Language Arts (ELA), the target is 55.1% by 2030. As noted in the prior section, the state aims for students with disabilities to reach a four-year cohort graduation rate of 74.9% by 2030.

Achieving the ESSA plan goals for 2030 (modeled in Short-term A) would substantially reduce achievement gaps, but it would not completely eliminate gaps between students with disabilities and their peers. However, Short-term A demonstrates that the state does not currently fund its education system sufficiently to allow it to reach its own minimal targets for students with disabilities. Second, it offers a starting point for discussion among decision-makers about education funding levels using the state's own documented goals for these students.

The second short-term scenario ("Short-term B"), is also based on the state's ESSA plan, but sets a higher standard of bringing the performance of students with disabilities up to the goal set for all students. Specifically, this includes proficiency levels of 67.8% in Math and 71.3% in ELA, again by 2030. With respect to graduation rates, the state aims for students with disabilities to reach a four-year cohort graduation rate of 74.9% for students with disabilities by 2020.

With respect to performance gaps between students with disabilities and their peers, Short-term B results in a closure of that gap to all students for ELA and math.

Exhibit 4-28. Comparison of Short-term A and Short-term B Scenarios Phased in Over 10 years

	Current (2017-18)	Short-term A: ESSA Target for Students with Disabilities by 2030	Short-term B: ESSA Target for All Students by 2030
Estimated State Spending ($ in millions)	n/a	$194.4	$218.9
Per-Pupil Cost estimate ($)	n/a	$1,999	$2,252
Statewide ELA Proficiency	37.0%	71.3%	71.3%
Statewide Mathematics Proficiency	46.0%	67.8%	67.8%
Four-Year Adjusted Cohort Grad Rate: Students with Disabilities	66.8%	74.9%	74.9%
Average IEP Goals Progress	91%	91%	91%
ELA Proficiency: Students with Disabilities	11.2%	55.1%	71.3%

	Current (2017-18)	Short-term A: ESSA Target for Students with Disabilities by 2030	Short-term B: ESSA Target for All Students by 2030
Math Proficiency: Students with Disabilities	11.5%	55.5%	67.8%

Notes: Overall subject-level proficiency data (i.e. math and ELA) includes all grade levels 4–8 (Mathematics) and 4–8, 10 (ELA). Dollar values adjusted for inflation to 2019 dollars using the Bureau of Labor Statistics CPI calculations over the period July 2018 to July 2019. These figures would need to be further adjusted for inflation over the next ten years.
Source: Authors' calculations based on cost function model analysis

The third, and final, short-term scenario ("Short-term C") sets the highest standard of the three. The goals set by the Kirwan Commission of 100% proficiency prompts a higher standard for all students, and the imperative for students with disabilities on par with their peers suggests this high standard should extend to these students as well. Realistically, the percentage after accounting for intra-state mobility rates in Maryland would establish an outcome and performance measure equivalent to approximately 92.5% for ELA and math.

With respect to performance gaps between students with disabilities and their peers, Short-term C results in near closure of that gap to that proficiency rate.

Exhibit 4-29. Short-term C scenario phased in over 10-year period

	Current (2017-18)	Short-term C: Adequacy
Estimated State Spending ($ in millions)	n/a	$278.9
Per-Pupil Cost estimate ($)	n/a	$2,868
Statewide ELA Proficiency	37.0%	92.5%
Statewide Mathematics Proficiency	46.0%	92.5%
Four-Year Adjusted Cohort Grad Rate: Students with Disabilities	66.8%	74.9%
Average IEP Goals Progress	91%	91%
ELA Proficiency: Students with Disabilities	11.2%	92.5%
Math Proficiency: Students with Disabilities	11.5%	92.5%

Notes: Overall subject-level proficiency data (i.e. math and ELA) includes all grade levels 4–8 (Mathematics) and 4–8, 10 (ELA). Dollar values adjusted for inflation to 2019 dollars using the Bureau of Labor Statistics CPI calculations over the period July 2018 to July 2019. These figures would need to be further adjusted for inflation over the next ten years.
Source: Authors' calculations based on cost function model analysis

Ongoing Investment Scenarios

In the context of student growth, ongoing growth means that every student with an IEP is achieving average annual growth for each year of instruction. In modeling student growth, this equates to a conditional normal curve equivalent (NCE) score of 50. A conditional NCE score of 50 indicates that, on average, students performed exactly as expected given their prior test performance. (By contrast, a conditional NCE score of 80, for example, would indicate that, on average, they performed as well as or better than 80% of their peers.)

Under Ongoing A, the cost estimate assumes that all students with disabilities achieve average annual growth. Thus, some students — those with above average growth in the most recent year, would actual grow less under this scenario. Thus, this maintenance of average annual growth is the minimum standard for ongoing funds. Exhibit 4-30 below outlines the differences in spending between the state's current investment and local contribution compared to the potential investment under the Ongoing A scenario.

Exhibit 4-30. Comparison of current spending versus ongoing A

	Current (2017-18)	Ongoing A	Adjusted Total	% Diff.
Estimated State Spend, Local Contribution ($ in Millions)	$1,471.2	$75.4	$1,546.6	5%
Per-Pupil Cost Estimate ($)	$14,356	$775	$15,131	5%

Note: Dollar values adjusted for inflation to 2019 dollars using the Bureau of Labor Statistics cost price index (CPI) calculations over the period July 2018 to July 2019. These figures would need to be further adjusted for inflation over the next ten years.
Source: Authors' calculations based on cost function model analysis

The second scenario ("Ongoing B") recognizes that some students with disabilities already grow more than the average, even in the lowest-performing LSSs. Under this scenario, the education cost function estimates the amount of funding required to ensure that each student with an IEP achieves *at least* average annual growth, maintaining the academic growth of students already performing at or above the average.

Exhibit 4-31. Comparison of current spending versus ongoing B

	Current (2017-18)	Ongoing B	Adjusted Total	% Diff.
Estimated State Spend, Local Contribution ($ in Millions)	$1,471.2	$265.6	$1,736.8	18%
Per-Pupil Cost Estimate ($)	$14,356	$2,868	$17,224	18%

Note: Dollar values adjusted for inflation to 2019 dollars using the Bureau of Labor Statistics cost price index (CPI) calculations over the period July 2018 to July 2019. These figures would need to be further adjusted for inflation over the next ten years.
Source: Authors' calculations based on cost function model analysis

The difference between Ongoing B and Ongoing A represents the additional spending associated with allowing any student above a conditional NCE of 50 to continue to grow and ensuring that all students are brought up to 50. Exhibit 57 outlines the differences in spending between the state's current investment and local contribution compared to the potential investment under the Ongoing B scenario.

Appendix 5: Results of state weights study

Exhibit 5-1. Effect of Differentiation on ELA

Variables	(1)	(2)	(3)	(4)	(5)
	ELA K	ELA 1st	ELA 2nd	ELA 3rd	ELA 4th
Differ by Category	-0.00701	0.0480	0.0501	0.0312	0.0664
	(0.0742)	(0.0584)	(0.0544)	(0.0476)	(0.0593)
Observations	2,155	2,143	2,143	2,144	2,156
R-squared	0.697	0.577	0.496	0.490	0.441

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-2. Effect of Differentiation on Math

Variables	(1)	(2)	(3)	(4)	(5)
	Math K	Math 1st	Math 2nd	Math 3rd	Math 4th
Differ by Category	0.0707	0.107*	0.117**	0.134**	0.159***
	(0.0844)	(0.0582)	(0.0543)	(0.0589)	(0.0535)
Observations	2,154	2,143	2,144	2,146	2,156
R-squared	0.701	0.620	0.538	0.497	0.464

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-3. Effect of Revenue on ELA

Variables	(1)	(2)	(3)	(4)	(5)
	ELA K	ELA 1st	ELA 2nd	ELA 3rd	ELA 4th
Rev. Per Pupil	-0.00120	0.0112	0.0146***	0.0146**	0.00519
	(0.00806)	(0.00678)	(0.00534)	(0.00639)	(0.00406)

Variables	(1)	(2)	(3)	(4)	(5)
	ELA K	ELA 1st	ELA 2nd	ELA 3rd	ELA 4th
Observations	2,155	2,143	2,143	2,144	2,156
R-squared	0.697	0.578	0.498	0.492	0.441

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-4. Effect of Revenue on Math

Variables	(1)	(2)	(3)	(4)	(5)
	Math K	Math 1st	Math 2nd	Math 3rd	Math 4th
Rev. Per Pupil	0.00654	0.00317	0.00786	0.00599	0.00654
	(0.00845)	(0.00629)	(0.00758)	(0.00759)	(0.00760)
Observations	2,154	2,143	2,144	2,146	2,156
R-squared	0.701	0.618	0.536	0.494	0.461

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-5. Effect of Using Actual Student Count on ELA

Variables	(1)	(2)	(3)	(4)	(5)
	ELA K	ELA 1st	ELA 2nd	ELA 3rd	ELA 4th
Actual Student Count	0.0284	0.0463	0.0244	0.0322	0.0383
	(0.0606)	(0.0521)	(0.0543)	(0.0452)	(0.0582)
Observations	2,010	1,999	1,999	1,999	2,012
R-squared	0.699	0.572	0.490	0.486	0.441

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-6. Effect of Using Actual Student Count on Math

Variables	(1)	(2)	(3)	(4)	(5)
	Math K	Math 1st	Math 2nd	Math 3rd	Math 4th
Actual Student Count	-0.0135	0.0552	0.0552	0.116*	0.144**
	(0.0745)	(0.0746)	(0.0696)	(0.0624)	(0.0696)
Observations	2,009	1,999	2,000	2,001	2,011
R-squared	0.702	0.620	0.539	0.501	0.464

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-7. Effect of Differentiation on Self-Control

Variables	(1)	(2)	(3)	(4)
	Self-Control K	Self-Control 1st	Self-Control 2nd	Self-Control 3rd
Differ by Category	0.0510	0.00748	0.00323	0.0365
	(0.0376)	(0.0295)	(0.0334)	(0.0347)
Observations	2,110	1,932	2,003	2,029
R-squared	0.522	0.354	0.277	0.254

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-8. Effect of Differentiation on Interpersonal Skills

Variables	(1)	(2)	(3)	(4)
	Interpersonal K	Interpersonal 1st	Interpersonal 2nd	Interpersonal 3rd
Differ by Category	0.0533	0.0621*	-0.0266	0.0226
	(0.0353)	(0.0319)	(0.0417)	(0.0435)

Variables	(1)	(2)	(3)	(4)
	Interpersonal K	Interpersonal 1st	Interpersonal 2nd	Interpersonal 3rd
Observations	2,110	1,944	2,008	2,027
R-squared	0.487	0.305	0.249	0.232

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-9. Effect of Differentiation on Problem Behavior

Variables	(1)	(2)	(3)	(4)
	Ext Prob Behavior K	Ext Prob Behavior 1st	Ext Prob Behavior 2nd	Ext Prob Behavior 3rd
Differ by Category	-0.00489	-0.0133	0.00561	0.0282
	(0.0306)	(0.0306)	(0.0320)	(0.0415)
Observations	2,117	1,954	2,036	2,048
R-squared	0.583	0.407	0.313	0.297

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-10. Effect of Differentiation on Internalizing Problem Behavior

Variables	(1)	(2)	(3)	(4)
	Int Prob Behavior K	Int Prob Behavior 1st	Int Prob Behavior 2nd	Int Prob Behavior 3rd
Differ by Category	-0.0256	-0.0245	-0.0157	0.0121
	(0.0313)	(0.0330)	(0.0412)	(0.0255)
Observations	2,119	1,947	2,025	2,038
R-squared	0.382	0.183	0.156	0.165

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-11. Effect of Differentiation on Approaches to Learning

Variables	(1)	(2)	(3)	(4)
	Approach to Learning K	Approach to Learning 1st	Approach to Learning 2nd	Approach to Learning 3rd
Differ by Category	0.0780**	0.0404	-0.00349	0.0406
	(0.0331)	(0.0358)	(0.0368)	(0.0356)
Observations	2,122	1,962	2,036	2,048
R-squared	0.592	0.385	0.357	0.327

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-12. Effect of Differentiation on Independence in Work

Variables	(1)	(2)	(3)	(4)
	Works Independently K	Works Independently 1st	Works Independently 2nd	Works Independently 3rd
Differ by Category	0.0753*	0.0499	0.0206	0.0618
	(0.0415)	(0.0429)	(0.0543)	(0.0525)
Observations	2,126	1,960	2,036	2,050
R-squared	0.448	0.327	0.278	0.270

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-13. Effect of Differentiation on Independence in Work

Variables	(1)	(2)	(3)	(4)
	Task Persistence K	Task Persistence 1st	Task Persistence 2nd	Task Persistence 3rd
Differ by Category	0.120**	0.0392	0.00816	0.0189

Variables	(1)	(2)	(3)	(4)
	Task Persistence K	Task Persistence 1st	Task Persistence 2nd	Task Persistence 3rd
	(0.0510)	(0.0593)	(0.0561)	(0.0416)
Observations	2,118	1,960	2,037	2,050
R-squared	0.398	0.251	0.253	0.245

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-14. Effect of Revenue on Self Control

Variables	(1)	(2)	(3)	(4)
	Self-Control K	Self-Control 1st	Self-Control 2nd	Self-Control 3rd
Rev. Per Pupil	0.00645*	0.00114	-0.000412	-0.00195
	(0.00380)	(0.00254)	(0.00415)	(0.00404)
Observations	2,110	1,932	2,003	2,029
R-squared	0.522	0.354	0.277	0.254

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-15. Effect of Revenue on Interpersonal Skills

Variables	(1)	(2)	(3)	(4)
	Interpersonal K	Interpersonal 1st	Interpersonal 2nd	Interpersonal 3rd
Rev. Per Pupil	0.00788**	0.00341	0.00334	-0.00186
	(0.00329)	(0.00390)	(0.00444)	(0.00491)
Observations	2,110	1,944	2,008	2,027
R-squared	0.487	0.304	0.249	0.232

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-16. Effect of Revenue on Externalizing Problem Behavior

Variables	(1)	(2)	(3)	(4)
	Ext Prob Behavior K	Ext Prob Behavior 1st	Ext Prob Behavior 2nd	Ext Prob Behavior 3rd
Rev. Per Pupil	-0.00540*	-0.00350	-0.00303	0.00203
	(0.00303)	(0.00371)	(0.00345)	(0.00441)
Observations	2,117	1,954	2,036	2,048
R-squared	0.584	0.407	0.314	0.296

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-17. Effect of Revenue on Internalizing Problem Behavior

Variables	(1)	(2)	(3)	(4)
	Int Prob Behavior K	Int Prob Behavior 1st	Int Prob Behavior 2nd	Int Prob Behavior 3rd
Rev. Per Pupil	0.00108	-0.00204	-0.00122	0.00363
	(0.00363)	(0.00403)	(0.00345)	(0.00301)
Observations	2,119	1,947	2,025	2,038
R-squared	0.382	0.182	0.156	0.165

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-18. Effect of Revenue on Internalizing Problem Behavior

Variables	(1)	(2)	(3)	(4)
	Approach to Learning K	Approach to Learning 1st	Approach to Learning 2nd	Approach to Learning 3rd
Rev. Per Pupil	0.00445	0.00133	0.00360	0.00171
	(0.00444)	(0.00474)	(0.00420)	(0.00514)
Observations	2,122	1,962	2,036	2,048
R-squared	0.590	0.384	0.357	0.327

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-19. Effect of Revenue on Independence in Work

Variables	(1)	(2)	(3)	(4)
	Works Independently K	Works Independently 1st	Works Independently 2nd	Works Independently 3rd
Rev. Per Pupil	0.00172	0.00346	-0.00286	0.00149
	(0.00511)	(0.00615)	(0.00625)	(0.00780)
Observations	2,126	1,960	2,036	2,050
R-squared	0.446	0.326	0.278	0.269

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-20. Effect of Revenue on Task Persistence

Variables	(1)	(2)	(3)	(4)
	Task Persistence K	Task Persistence 1st	Task Persistence 2nd	Task Persistence 3rd
Rev. Per Pupil	0.00518	0.00347	0.00256	0.000816

Variables	(1)	(2)	(3)	(4)
	Task Persistence K	Task Persistence 1st	Task Persistence 2nd	Task Persistence 3rd
	(0.00492)	(0.00521)	(0.00568)	(0.00698)
Observations	2,118	1,960	2,037	2,050
R-squared	0.395	0.251	0.253	0.245

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-21. Effect of Using Actual Student Counts on Self-Control

Variables	(1)	(2)	(3)	(4)
	Self-Control K	Self-Control 1st	Self-Control 2nd	Self-Control 3rd
Actual Student Count	0.0270	0.00784	-0.00431	0.0670**
	(0.0409)	(0.0303)	(0.0321)	(0.0308)
Observations	1,972	1,798	1,871	1,893
R-squared	0.518	0.350	0.274	0.253

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-22. Effect of Using Actual Student Counts on Interpersonal Skills

Variables	(1)	(2)	(3)	(4)
	Interpersonal K	Interpersonal 1st	Interpersonal 2nd	Interpersonal 3rd
Actual Student Count	0.0199	0.0420	-0.0303	0.0450
	(0.0406)	(0.0383)	(0.0413)	(0.0363)
Observations	1,971	1,811	1,873	1,888
R-squared	0.486	0.299	0.247	0.232

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-23. Effect of Using Actual Student Counts on Externalizing Problem Behavior

Variables	(1)	(2)	(3)	(4)
	Ext Prob Behavior K	Ext Prob Behavior 1st	Ext Prob Behavior 2nd	Ext Prob Behavior 3rd
Actual Student Count	-0.0185	-0.0383	0.0296	-0.0540
	(0.0287)	(0.0310)	(0.0282)	(0.0396)
Observations	1,977	1,820	1,900	1,909
R-squared	0.584	0.405	0.312	0.291

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-24. Effect of Using Actual Student Counts on Internalizing Problem Behavior

Variables	(1)	(2)	(3)	(4)
	Int Prob Behavior K	Int Prob Behavior 1st	Int Prob Behavior 2nd	Int Prob Behavior 3rd
Actual Student Count	-0.00141	-0.0252	0.0282	0.0101
	(0.0268)	(0.0367)	(0.0424)	(0.0203)
Observations	1,978	1,815	1,889	1,899
R-squared	0.391	0.183	0.159	0.172

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-25. Effect of Using Actual Student Counts on Approaches to Learning

Variables	(1)	(2)	(3)	(4)
	Approach to Learning K	Approach to Learning 1st	Approach to Learning 2nd	Approach to Learning 3rd
Actual Student Count	0.0268	0.0667*	0.0313	0.0913***
	(0.0442)	(0.0380)	(0.0353)	(0.0285)
Observations	1,982	1,828	1,900	1,909
R-squared	0.587	0.385	0.356	0.330

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-26. Effect of Using Actual Student Counts on Independence of Work

Variables	(1)	(2)	(3)	(4)
	Works Independently K	Works Independently 1st	Works Independently 2nd	Works Independently 3rd
Actual Student Count	0.0313	0.0653	0.0533	0.147***
	(0.0439)	(0.0389)	(0.0602)	(0.0536)
Observations	1,985	1,826	1,900	1,910
R-squared	0.442	0.325	0.286	0.279

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Exhibit 5-27. Effect of Using Actual Student Counts on Task Persistence

Variables	(1)	(2)	(3)	(4)
	Task Persistence K	Task Persistence 1st	Task Persistence 2nd	Task Persistence 3rd
Actual Student Count	0.0286	0.0546	0.0150	0.0864**
	(0.0711)	(0.0495)	(0.0543)	(0.0400)
Observations	1,979	1,826	1,901	1,910
R-squared	0.397	0.256	0.250	0.251

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix 6: 50-state special education funding formula and weightings summary

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
AL	Formula- Resource Allocation Model	Alabama uses a resource allocation model to provide funding to its school districts. Special education is funded by providing additional weighted students to each district at a 2.5 weight per special education student on a census-basis of 5% of total ADM. Resource allocations are then calculated based upon the higher weighted ADM.	Census	Census, with funding for 5% of ADM.	Single weight of 2.5 for each special education student.	
AK	Formula- Multiple Weights	Alaska uses a two-tier weighted funding approach for special education based upon intensity. Non-intensive special education students are funded as part of block grant which increases total district ADM by 20 percent. The block grant is designed to provide funding for four categories of special instruction: vocational education, non-intensive special education students, gifted/talented education, and bilingual/bicultural education. The second tier is a weight of 13 for	Hybrid	Non-intensive: census; Intensive: actual student count	Non-intensive: .2 additional as part of 4-component block grant (applied to total ADM); Intensive: 13	

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
		intensive needs special education students.				
AZ	Formula- Multiple Weights	Arizona provides funding weighted funding for a number of different groups of special education students. The weights are applied to the base funding amount for the state. Funding is based on actual students.	Actual	Actual special education student counts by disability categories.	• Multiple Disability Severe Sensory Impairment- 7.947 • Orthopedic impairment (self-contained)- 6.773 • Resource program multiple disability, autism, severe intellectual disability- 6.024 • Self-contained program multiple disability, autism, severe intellectual disability- 5.833 • Emotionally disabled- 4.822 • Visual impairment- 4.806 • Hearing impairment- 4.771 • Moderate intellectual disability-4.421 • Preschool severe delay- 3.595 • Resource program orthopedic impairment- 3.158	No, but provides additional funding for residential facilities.

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
					· Emotional disabilities, mild intellectual disabilities, specific learning disability, speech/language impairment and others-0.003.	
AR	Within Base	Arkansas provides funding for its districts through a resource allocation funding model. The majority of special education funding for the state is included in this model. This creates a census-based funding system. In addition to the census-based funding, actual costs exceeding $15,000 per student are reimbursed by the state through a categorical funding system.	Census			Funding for 100% of the first $15,000 above $15,000, 80% of the next $35,000, and 50% of the next $50,000.
CA	Categorical	California uses a categorical funding system provides state aid to LEAs based on their average daily attendance (ADA) assuming a relatively equal distribution of students and disabilities (census approach). The state sets per-ADA rates for each Special Education Local Plan Area (SELPA), or regional groupings of LEAs. These SELPA rates vary significantly, as when the funding system for special education was first implementing, per ADA funding was based upon prior	Census			Additional high cost add on funding is provided for nonpublic placements, low incidence disabilities and sparsely populated SELPAs.

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
		expenditures under the previous funding system. SELPAs also receive additional categorical dollars for mental health services.				
CO	Categorical	Colorado uses a two-tier categorical reimbursement system outlined by the state's Exceptional Children's Educational Act. Districts receive funding for students in one of 14 disability categories. All special education students receive the lower tier of funding, Tier A, and higher costs students receive additional funding from Tier B.	Actual	Tier A funding is allocated to all special education students in the 14 disability categories, with additional Tier B funding for Intellectual Disability, Serious Emotional Disability, Hearing Impairment, including deafness, Visual Impairment, including blindness, Deaf-Blindness, Multiple Disabilities, Autism Spectrum Disorders, and Traumatic Brain Injury.		Districts can apply for reimbursement from a high cost pool.
CT	Within Base	Connecticut does not provide additional specific funding for special education beyond funds for extraordinary costs. Funding for special education is included as part of the base funding per pupil.	Census			Reimbursement for costs above 4.5 times the districts prior year per student funding.
DE	Formula- Resource Allocation Model	Delaware provides funding through a resource allocation approach, determining the number of units needed for each district. Special education funding is provided based on three levels of service need including Basic, Intensive, or Complex.	Actual	Actual special education student count in each category: • Basic: a student enrolled in grades 4 through 12; identified as eligible for special education and related services; and not counted in the intensive or		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
		Districts receive a unit per a specific number of special education students. Districts receive one unit per 8.4 Basic students, 6.0 Intensive students, and 2.6 Complex students.		complex count. A student is not required to receive a minimum number of hours of special education instruction to count as a student in the basic unit. • Intensive: a student enrolled in preschool through grade 12; identified as a student eligible for special education; and (a) In need of a moderate level of instructional, behavioral, personal support, or health support characterized individually or in combination by the following: (i) Need for adult-student ratio of 1:3 to 1:8 for a substantial portion of educational program; (ii) Need for staff support for mid-range or moderate-use of assistive technology; (iii) Need for some extended school year or relatively frequent but intermittent out-of-school services (e.g. hospital, homebound); (iv) Need for moderate level of related services, including interpreter, therapy, and school nurse and health services; and (v) Need for non-routine or frequent accommodations or adaptions to		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
				curriculum or educational environment. • Complex: a student enrolled in preschool through grade 12; identified as a student eligible for special education; and (a) In need of a high level of instructional, behavioral, personal support, or health support characterized individually or in combination by the following: (i) Need for adult-student ratio of 1:1 to 1:2 for a substantial portion of educational program; (ii) Need for staff support for high-tech or extensive-use assistive technology which may include both high and low technology items; (iii) Need for extensive extended school year or relatively frequent but intermittent out-of-school services (e.g. hospital, homebound); (iv) Need for extensive level of related services, including interpreter, therapy, and school nurse and health services; and 3 (v) Need for extraordinary or extensive accommodations or adaptations		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
				to curriculum or educational environment. Note: a student is counted in the basic, intensive, or complex unit based upon the educational needs of the student identified in the individualized education program (IEP).		
FL	Hybrid (Formula-Multiple Weights and Categorical)	Florida identifies 5 levels of special education students ranging from the lowest level of need, level 1, to the highest level of need, level 5. Special education students in levels 1-3 are funded through the states Exceptional Student Education (ESE) categorical funding program. Students in levels 4 & 5 receive weighted funding.	Actual	Actual special education students are counted, with caps on level 4 & 5 students. Student categorization in levels 1-5 is based upon needs assessment using a matrix of services to evaluate students in five domains based upon the nature and intensity of service: • Level 1 indicates that the student requires no services or assistance beyond those that are normally available to all students. • Level 2 indicates the student is receiving assistance on a periodic basis or receives minor supports, assistance or services • Level 3 indicates the student is receiving accommodations to the learning environment that are more complex or is receiving		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
				services on a more frequent schedule. • Level 4 indicates that for the majority of learning activities, the student is receiving specialized approaches, assistance or equipment, or is receiving more extensive modifications to the learning environment. • Level 5 indicates that the student is receiving continuous and intense (one-on-one or very small group) assistance.		
GA	Formula- Multiple Weights	Georgia provides funding through 5 special education weights. Categories 1-4 for special education students who spend time outside of the general education classroom to receive special education services and category 5 for those who receive all services in the general education classroom. The state provides additional reimbursement for the highest cost students.	Actual	Actual special education students are counted by disability category: • Category I (self-contained learning disabled and speech-language disordered) • Category II (mildly mentally disabled) • Category III (behavior disordered, moderately mentally disabled, severely mentally disabled, resourced specific learning disabled, resourced speech-language disordered, self-contained hearing impaired/deaf, self-contained	• Category I: 1.3901 • Category II: 1.8051 • Category III: 2.5718 • Category IV: 4.7898 • Category V: 1.4583	Additional funding is provided for students with costs exceeding $27,000.

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
				orthopedically disabled, self-contained other health impaired) • Category IV (deaf-blind, profoundly mentally disabled, visually impaired and blind, resourced hearing impaired/deaf; resourced orthopedically disabled, and resourced other health impaired) • Category V (special education students receiving services is a general education setting)		
HI	Categorical	Hawaii is a single statewide system unlike any other state. Special education funding is provided through a proportional staffing model related to the total funding allocated by the state for special education.	Actual	Actual student counts based upon need.		
ID	Formula- Resource Allocation Model	Idaho provides funding through a resource allocation model using a census-based student count. Districts receive special education funding for 6% of their K-6 students and 5.5% of 7-12 students. Districts are provided a unit of funding for each 14.5 special education students in the census count.	Census			Funding available for some specific circumstances.

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
IL	Formula- Resource Allocation Model	Illinois provides special education funding on a census-based approach within its base resource allocation. Funds are distributed to the district based on resource allocations related to the district's total enrollment, it is not specific to the full special education count. Districts receive 1 special education core teacher and instruction assistant for every 141 total students and 1 psychologist for every 1,000 students.	Census			No, but do reimburse for portion of private placements.
IN	Formula- Multiple Dollar Amounts	Indiana provides funding for four levels of special education need. The dollar amounts per student are adjusted periodically but are not a defined weight on top of a base funding amount.	Actual	Actual student counts, in the following categories: • Mild and moderate disabilities • Severe disabilities • Communication disorders • Homebound		
IA	Formula- Multiple Weights	Iowa provides funding through its formula utilizing weights for three different levels of special education students. The weights are applied to the actual count of students in each level.	Actual	Actual student counts, by level: • Level 1- Students receiving specialty designed instruction for a part of the educational program (includes modifications and adaptations to the general education program) • Level 2 - Students receiving specially designed instruction for a majority of the educational program (includes substantial modifications, adaptations, and	• Level 1: 0.72 • Level 2: 1.21 • Level 3: 2.74	

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
				special education accommodations to the general education program) • Level 3 – Students receiving specially designed instruction for most or all of the educational program (requires extensive redesign of curriculum and substantial modification of instructional techniques, strategies and materials)		
KS	Reimbursement	Kansas provides reimbursement to districts calculated as of 92% of special education expenditures less cost of regular education, federal funding, Medicaid reimbursements and state hospital administrative costs.	Actual	(Actual counts via reimbursement)		
KY	Formula- Multiple Weights	Kentucky provides funding through weights for three levels of special education, Low, Moderate and High Incidence disabilities.	Actual	Actual count of special education students by disability category: • Low Incident Disabilities: Functional Mental Disability, Hearing Impairment, Emotional-Behavioral Disability, Visual Impairment, Multiple Disabilities, Deaf-Blind, Autism, and Traumatic Brain Injury • Moderate Incident Disabilities: Mild Mental Disability, Orthopedic Impairment or Physically Disabled, Other Health	• Low Incident Disabilities: 2.35 • Moderate Incident Disabilities: 1.17 • High Incident Disability: .24 weight	

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
				Impaired, Specific Learning Disabilities, and Developmental Delay • High Incident Disability (Communication Disorders of Speech or Language)		
LA	Formula- Single Weight	Louisiana provides special education funding through a weighted formula. Each special education student is funded at an additional weight of 1.5, regardless of disability or services provided.	Actual	Actual student count, no disaggregation based upon disability.	1.5 for all special education students	
ME	Formula- Multiple Weights	Maine funds special education through a two-tiered weighted formula based upon concentration. For each special education student up to 15 percent of the total district enrollment, a weight of 1.277 will be applied. Any districts that have student counts above that threshold will receive a reduced weight of 0.38 for students in excess of 15 percent. Additionally, if there are fewer than 20 students in the district, each special education student will receive an additional 0.29 weight.	Actual	Actual student count, no disaggregation based upon disability.	Two weights based upon concentration: up to 15%: 1.277; more than 15%: 0.38. if fewer than 20 students in district, each student will receive an added weight of 0.29.	Two high cost adjustments: High Cost In-District Adjustment - Allocates additional funds for students estimated using an inflation factor of 1.5%; High Cost Out-of-District Adjustment - Allocates additional funds for students estimated to cost 4X the statewide special education EPS rate.
MD	Formula- Single Weight	Maryland has a weighted student formula that provides a base and weights for student need, including special education. All special education	Actual	Actual student count, no disaggregation based upon disability.	0.74 for all special education students	No, but nonpublic placements are separately funded by the state.

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
		students in Maryland are funded at a weight of 0.74, regardless of disability or level of service required.				
MA	Formula- Multiple Dollar Amounts	Massachusetts provides set dollar amounts for two categories of special education students- in-district and out-of-district. In-district Special Education and Out-of-District Special Education. The number of students in each category is set at an assumed percentage of foundation enrollment.	Actual	Assumed in-district special education enrollment is set at 3.75 percent of foundation enrollment (not including pre-kindergarten and vocational pupils) and 4.75 percent of vocational enrollment. Assumed out-of-district special education enrollment is set at one percent of total foundation enrollment (again not including pre-kindergarten and vocational pupils)."		Allocates additional funds for students estimated to cost 4X the statewide special education EPS rate.
MI	Reimbursement	By statute, the state reimburses districts for 28.6138% of total approved costs for special education, including salaries for special education personnel, and 70.4165% of total approved costs for special education transportation. If these proportions amount to less than the full per-student base amount times the number of students with disabilities, then the state must provide at least that number. However, the reimbursement may not exceed 75% of total approved costs.	Actual	(Actual counts via reimbursement)		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
MN	Reimbursement	For fiscal year 2016 and later, a district's special education initial aid equals the sum of: 1) the least of: a) 62 percent of the district's old formula special education expenditures for the prior fiscal year, excluding pupil transportation expenditures, b) 50 percent of the district's nonfederal special education expenditures for the prior year, excluding pupil transportation expenditures, or c) 56 percent of the product of the sum of the following amounts, computed using prior fiscal year data, and the program growth factor: i) the product of the district's average daily membership served and the sum of: (1) $450; plus (2) $400 times the ratio of the sum of the number of pupils enrolled on October 1 who are eligible to receive free lunch plus one-half of the pupils enrolled on October 1 who are eligible to receive reduced-price lunch to the total October 1 enrollment; plus (3) .008 times the district's average daily membership served; plus	Actual	(Actual counts via reimbursement)		Excess Cost Aid for districts that have large unreimbursed special education costs relative to the district's general education revenue. Excess cost aid is calculated as the greatest of: (1) 56 percent of the difference between the district's unreimbursed nonfederal special education costs and 7 percent of the district's general education revenue, OR (2) 62 percent of the difference between the district's unreimbursed "old formula" special education costs and 2.5 percent of the district's general education revenue, OR (3) Zero

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
		ii) $10,400 times the December 1 child count for the primary disability areas of autism spectrum disorders, developmental delay, and severely multiply impaired; plus iii) $18,000 times the December 1 child count for the primary disability areas of deaf and hard-of-hearing and emotional or behavioral disorders; plus iv) $27,000 times the December 1 child count for the primary disability areas of developmentally cognitive mild-moderate, developmentally cognitive severe-profound, physically impaired, visually impaired, and deafblind; plus d) the cost of providing transportation services for children with disabilities under section 123B.92, subdivision 1, paragraph (b), clause (4). For fiscal year 2016 and later, a district's special education initial aid equals the sum of: 1) the least of: a) 62 percent of the district's old formula special education expenditures for the prior fiscal year, excluding pupil transportation expenditures, b) 50 percent of the district's nonfederal special education expenditures for the prior year,				

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
		excluding pupil transportation expenditures, or c) 56 percent of the product of the sum of the following amounts, computed using prior fiscal year data, and the program growth factor: i) the product of the district's average daily membership served and the sum of: (1) $450; plus (2) $400 times the ratio of the sum of the number of pupils enrolled on October 1 who are eligible to receive free lunch plus one-half of the pupils enrolled on October 1 who are eligible to receive reduced-price lunch to the total October 1 enrollment; plus (3) .008 times the district's average daily membership served; plus ii) $10,400 times the December 1 child count for the primary disability areas of autism spectrum disorders, developmental delay, and severely multiply impaired; plus iii) $18,000 times the December 1 child count for the primary disability areas of deaf and hard-of-hearing and emotional or behavioral disorders; plus iv) $27,000 times the December 1 child count for the primary disability areas of developmentally cognitive mild-moderate, developmentally cognitive				

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
		severe-profound, physically impaired, visually impaired, and deafblind; plus d) the cost of providing transportation services for children with disabilities under section 123B.92, subdivision 1, paragraph (b), clause (4).				
MS	Hybrid (Formula-Resource Allocation Model and Categorical)	The State Department of Education provides an estimate of teacher units needed for special education, based on each approved program in the district. The average Special Education salary is used, along with benefit add-on, to calculate the special education component. All of the add-ons (SpEd, Gifted, CTE) are totaled in a block amount for districts to distribute according to their discretion/needs. The remainder of state special education funding is distributed through specific program-based allocations, including funding for sign-language interpreters, positive behavior specialists, extended-year instruction, the education of students with disabilities in state-approved private schools and facilities, and partial scholarships (vouchers) for special-needs students whose parents wish to enroll them in private school.	Actual	Actual student counts in approved programs		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
		All special education funding is based upon legislative appropriation; if special education is not fully funded, funding is prorated.				
MS	Formula- Single Weight	Missouri applies a single weight for all students with disabilities, regardless of severity, but only above a certain population concentration threshold. For FY18, funding is only provided for special education students above a threshold of 12.16% of district enrollment. 2019 & 2020 Threshold will be 12.06%	Actual	Actual student count, no disaggregation based upon disability.	.75 applied above concentration threshold.	High Need Fund is a reimbursement program for students whose educational costs exceed three times the LEA's current expenditure per ADA. Out-of-district placements are also funded separately.
MO	Categorical- Single Dollar Amount	The state provides special education funding on a census-based system with a set dollar amount applied total enrollment. The set dollar amount is $151.16 per student for special education instruction plus $50.38 per student for special education related services.	Census			Reimbursement (40%) for Disproportionate Costs—Districts with unusually high special education costs may be eligible for additional special education reimbursements. Additional program-based allocations, including funding for special education cooperatives, for administration and travel, and for services for disabled students who are placed by the state in a district other than their district of residence.

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
NE	Reimbursement	Nebraska partially reimburses districts for special education expenditures at a rate based upon the type of expense. Supplies and materials are only reimbursed when used to provide direct educational experiences or special education students. The total amount available for reimbursement is capped based upon legislative appropriation.	Actual	(Actual counts via reimbursement)		
NV	Hybrid (Within Base and Categorical)	State funding for students with disabilities is distributed proportionally to each school district and charter school largely based upon the number of students with a disability, not to exceed 13 percent of the total pupil enrollment for the school district or charter school.	Actual with cap	Actual special education student counts up to 13%.		Contingency Account for Special Education Services (CASE) for students with significant disabilities.
NH	Formula- Single Dollar Amount	New Hampshire provides a set dollar amount per special education student regardless of disability, applied to actual special education student counts.	Actual	Actual student count, no disaggregation based upon disability.		Catastrophic aid program provides reimbursement to districts for students with expenditures from 3.5-10% times state average at 80%, and over 10% times state average at 100%, subject to available appropriation (FY 2018 funded at 72.40%).

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
NJ	Formula- Multiple Dollar Amounts	New Jersey assumes that 14.92% of students in each district will require special education services and that 1.63% will require speech services only and provides flat amounts of funding for each student assumed to require those services.	Census			Partial reimbursement for high cost special education students with disabilities whose costs exceed $40,000 for a public school placement, or whose costs exceed $55,000 for a private school placement.
NM	Formula- Resource Allocation Model	New Mexico provides weighted student funding for special education in 4 categories (Class A, B, C, D) based upon their IEP requiring a minimal, moderate, extensive or maximum amount of special education. The ratio of students to professionals is regulated by the state board [department] and the number of special education program units is the sum of the following: students in class A and B programs multiplied by the cost differential factor .7, students in class C programs multiplied by the cost differential factor 1.0; and students in approved class D programs multiplied by the cost differential factor 2.0. The related services ancillary to providing special education, the number of full-time-equivalent certified or licensed ancillary service and diagnostic service personnel multiplied by the cost differential factor 25.0.	Actual	Actual student counts, by class (A-D) as set by service requirements of IEP (requiring a minimal, moderate, extensive or maximum amount of special education).	Additional staffing units based upon additional weighted student counts: Class A and B-: .7, Class C: 1.0, Class D: 2.0.	For special education students whose costs exceed three times the statewide average amount expended per student ($22,262 in FY2018; $23,439 in FY2019), but districts only qualify if they serve a certain minimum number of high-cost students (threshold varies with district size), The LEA must have expended at least 25% of the cost for FAPE for the student before applying to the fund.

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
NY	Formula- Single Weight	New York provides special education funding through an additional weight of 1.41 for each special education student.	Actual	Actual student count, no disaggregation based upon disability.		Through two programs: Public Excess Cost Aid. Aid = (Approved Program Cost – Deduct) x Aid Ratio. To be aid able, cost per student must exceed the lesser of $10,000 or (4 x 2015-16 Approved Operating Expenditure/Pupil). Deduct = 3 x 2015-16 AOE/pupil. Aid Ratio = 1 – (.51 x Combined Wealth Ratio); minimum = .25. This aid is in addition to Foundation Aid. Private Excess Cost Aid. Aid = (Approved Program Cost – Deduct) x Aid Ratio. Approved Program Cost = Base year private school tuition per pupil for district pupils placed in private school programs for the disabled.
NC	Formula- Single Dollar Amount	North Carolina provides a set dollar amount per special education student up to 12.75% of the local education agency's average daily membership (ADM).	Actual with cap	Actual count, capped at 12.75%.		Risk Pool Program Funds are for eligible ""high need"" children with disabilities who were enrolled in the LEA in the previous school year. ""High need"" is defined as any special education

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
						and/or related service(s) that is three times the per pupil expenditure and has a fiscal impact that limits and/or inhibits LEA/charter school's ability to provide special education and related services. A student considered ""high need"" may be funded annually, up to 5 cumulative years, if the same level of service is needed and the student continues to meet eligibility requirements. Out-of-District (OOD) funds may reimburse the LEA (up to 50%) with payment of excess costs associated with providing special education and related services to children with disabilities who are placed by the LEA in another LEA or public/private approved residential school. Exceptional Children Division reimburses Local Boards of Education the per-child allocations for average daily membership (ADM), state aid (April 1st)

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
						and IDEA 611 (December 1st) of children with disabilities assigned to group homes, foster homes, or similar facilities."
ND	Formula- Single Weight	North Dakota uses a census-based approach and applies a single weight of .082 to total enrollment.	Census		0.082 applied to total enrollment	The state also provides funding for individual students whose costs exceed four times the state average education cost per student and for districts spending more than 2% of their annual budgets on the provision of special education to any one student.
OH	Formula- Multiple Dollar Amounts	Ohio provides a set dollar amount per special education student based upon their disability category.	Actual	Actual student count by disability in six categories: Category 1: Speech and Language Impairments Category 2: Students with Specific Learning Disability, Students with Intellectual Disability, Students with Other Health Impairment (minor), Preschool Children who are Developmentally Delayed Category 3: Students with Deafness (Hearing Impaired), Students with Emotional		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
				Disturbance (Severe Behavior Disability – SBH) Category 4: Students with Visual Impairment, Students with Other Health Impairment (major) Category 5: Students with Orthopedic Impairment, Students with Multiple Disabilities (other than Deaf – Blindness) Category 6: Students with Autism, Students with Deaf – Blindness, Students with Traumatic Brain Injury		
OK	Formula- Multiple Weights	Oklahoma uses a weighted formula for special education based upon disability categories.	Actual	Actual student counts by disability.	Hearing Impairment: 2.9 Speech/Language Impairment: .005 Vision Impaired: 3.8 Emotional Disturbance: 2.5 Orthopedic Impairment: 1.2 Other Health Impairment: 1.2 Specific Learning Disability: .4 Deaf/Blindness: 3.8 Multiple Handicapped: 2.4 Autism: 2.4	

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
					Traumatic Brain Injury: 3.8 Intellectual Disability: 1.3	
OR	Formula- Single Weight	Oregon provides a weight of 1.0 for all special education students regardless of disability.	Actual with cap	Actual special education student counts, not to exceed 11%	1.0 for all special education students	State provides partial reimbursements for approved special education students who exceed $30,000.
PA	Categorical	Pennsylvania provides funding for special education via three weights based upon special education student category.	Actual	Students are counted by cost-to-serve category: Category 1: <$25,000 a year Category 2: $25,000- $49,999 a year Category 3: $50,000 a year	Category 1: 1.51, Category 2: 3.77, Category 3: 7.46	Special Education Contingency Fund.
RI	Within Base	Rhode Island provides a per student base amount that is intended to cover a portion of special education expenses.	Census			The state provides funds to defray costs that exceed five times the base.
SC	Formula- Multiple Weights	Special education students receive a weight based upon 10 disability categories.	Actual	Actual special education student counts by disability categories.	Educable mentally handicapped: .74 Learning disabilities: .74 Trainable mentally handicapped: 1.04 Emotionally handicapped: 1.04 Orthopedically handicapped: 1.04	

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
					Visually handicapped: 1.57 Hearing handicapped: 1.57 Speech handicapped: .90 Homebound pupils: 1.00 Autism: 1.57	
SD	Formula- Multiple Dollar Amounts	South Dakota provides a set dollar amount based upon disability in six levels.	Hybrid	Census-based for mild disability (Level 1)- set at 10.04 % of total student count; actual counts for other levels: • Level 2 - Cognitive disability, emotionally disturbed • Level 3 - Hearing loss, deafness, vision loss, deaf-blind, orthopedic impairment, traumatic brain injury • Level 4 – Autism • Level 5 - Multiple disability (must include 2 or more disabilities in levels 2, 3 or 4, not including Deaf-Blind) • Level 6 - Prolonged assistance		South Dakota districts can also apply to an extraordinary cost fund for additional funding for special education students with costly needs. Applications are reviewed by committee and may not necessarily be approved. In recent years, the fund has distributed approximately $4.5 million in additional aid to districts based on need.
TN	Formula- Resource Allocation Model	Tennessee provides funding for special education through a resource allocation model that identifies specific staff ratios to calculate allocated FTE	Actual	Actual students are counted by in the following option categories based upon service needs:		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
		and additional dollar figures for non-personnel costs: • Special education teaching personnel are allocated based upon one of ten teacher-to-student ratio options determined by student need: o Option 1, 1: 91 o Option 2-3, 1: 58.5 o Option 4-6, 1: 16.5 o Option 7-10, 1: 8.5 • Additional special education staff based upon the following ratios: • Special education supervisor, 1:750 • Special education assessment personnel, 1:600 • Special education assistant, 1:60 • Specific dollar amounts are also allocated for the following non-personnel cost categories: • Classroom materials and supplies, $36.50 per special education student • Instructional Equipment, $13.25 per special education student • Classroom-related Travel, $17.25 per special education student.		• Option 1: Consultation. Minimum of 2 contacts per month, except OT/PT (minimum of 3 contacts per year). Time must be reported. Direct Services equal less than 1 hour per week. Related Services equal less than 1 hour per week. • Option 2: Direct Services. Direct Services more than or equal to 1, but less than 4 hours per week; or, any one Related Service more than or equal to 1, but less than 4 hours per week. • Option 3: Direct Services. Direct Services more than or equal to 4, but less than 9 hours per week; or, any one Related Service more than or equal to 4, but less than 9 hours per week. • Option 4: Direct Services. Direct Services more than or equal to 9, but less than 14 hours per week; or, any one Related Service more than or equal to 9, but less than 14 hours per week. • Option 5: Direct Services. Direct Services more than or equal to 14, but less than 23 hours per week; or, any one Related Service more than or		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
				equal to 14, but less than 23 hours per week. • Option 6: Ancillary Services. Attendant provided so that the student can have at least 4 hours per day in less restrictive and general education settings. • Option 7: Direct Services. Special Education services 23 or more hours per week; or, any one Related Service 23 or more hours per week. • Option 8: Self-Contained or CDC. The sum of all direct services plus related services listed below plus up to 10 hours per week of special education educational assistant in the general program equals 32.5 or more hours per week. In addition, at least two Related Services from those specified below must be received for at least the associated minimum time. • Option 9: Residential Services. Services provided at least 24 hours per day. • Option 10: Hospital / Homebound. Services provided 3 or more hours per week.		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
TX	Formula- Multiple Weights	Texas allocates funding for special education by applying multiple weights against actual student counts in twelve categories based upon need and service environment.	Actual	Actual student count by disability/service category.	Homebound: 4.0 Hospital class: 2.0 Speech therapy: 4.0 Resource room: 2.0 Self-contained, mild and moderate, regular campus: 2.0 Self-contained, severe, regular campus: 2.0 Off home campus: 1.7 Nonpublic day school: .7 Vocational adjustment: 1.3 State schools: 1.8 Residential care and treatment: 3.0 Mainstream: .1	
UT	Categorical	Each district's grant amount is based on allocations from a previous year. The state provides special education funding in an amount that is modified from year to year based on the growth in special education enrollment. The number of students generating the aid is based on the previous-year allocation, to which the state adds an amount equal to the increase in special education enrollment between the previous year and the year before that, multiplied by 1.53.	Actual with cap	Actual student count up to 12.8% of total enrollment; the growth rate for special education enrollment cannot exceed the general enrollment growth rate in the district; and regardless of any drop in enrollment, the number of special-education pupils upon which the funding is based cannot be less than the average number of special education students enrolled over the previous five years.		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
VT	Hybrid (Formula-Resource Allocation Model and Reimbursement)	Each school district receives a grant based on salary costs: the state provides an amount equal to 60% of the district's special education units-9.75 special education teachers per 1,000 students the previous year times its average special education teacher salary for that year, plus the average special education administrator salary in the state for the previous year, prorated based on a statutory formula. Each district (or supervisory unit) also receives 1.0 FTE administrator and additional funding for administrative costs if over 1,500 students. also receives School districts also receive partial reimbursements for all special education expenditures not covered by federal aid, extraordinary aid, or other state sources; the reimbursement rate is set annually by the state in an effort to produce an outcome in which the total nonfederal cost of special education in the state is shouldered 60% by the state and 40% by localities.	Hybrid	Hybrid of census approach and actual student count. Note, the state has recently passed legislation to move to a full census approach.		Approved student costs above $50,000 are reimbursed at 90%. Costs for programs operated by the Vermont Center for the Deaf and Hard of Hearing are reimbursed at 80%. There is also 100% reimbursement for education of state-placed students, including those with out-of-state placements.
VA	Formula- Resource Allocation Model	Virginia provides a per student special education allocation determined by calculating the number of teachers and aides necessary to meet the special education program standards in each	Actual	Actual student counts by disability category: • Intellectual Disabilities • Hearing Impairment • Speech or Language Impairment		

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
		school based upon the actual count of students in 12 disability categories, and then determining the state's share of the cost based upon the district's ability to pay using a composite index.		• Visual Impairment • Emotional Disturbance • Orthopedic Impairment • Other Health Impairment • Specific Learning Disability • Deaf Blindness • Multiple Disabilities • Developmental Delay • Traumatic Brain Injury		
WA	Formula- Single Weight	Washington provides funding for special education students using a single weight of .9309 applied to all special education students regardless of disability, up to 13.5% of total enrollment.	Actual with cap	Actual special education student counts up to 13.5%.	0.9309 for all special education students	Additional funding is provided for students with costs above 2.3 of the state average in the prior year.
WV	Within Base	West Virginia has a resource allocation model that does not provide specific funding for special education students, except those with high acuity needs that exceed the capacity of the school district to provide services with available funds.	Census			Districts can apply for reimbursement for students with high equity needs and for out of district placements. The reimbursement for high equity needs students is calculated based upon necessary FTE in the following positions: teacher, therapist, aides, bus drivers/aides, and for a transportation allowance.

State	Funding Formula Type Detail	Funding Approach Description	Student Count Approach Category	Student Count Approach Detail	Weights, if applicable	High Cost Pool Description, if Available
WI	Reimbursement	Districts in Wisconsin may request reimbursement for staff costs, transportation, and a few other specific costs related to the education of students with disabilities. The state also reimburses the costs of health treatment related to particular disabilities, such as physical or orthopedic disabilities, hearing impairment, and emotional disturbance. The reimbursement rate is limited by the amount appropriated for this purpose; the estimated proration rate for FY2018 is 25.73%.	Actual	(Actual counts via reimbursement)		Additional funding is provided for students with costs exceeding $30,000.
WY	Reimbursement	Wyoming reimburses school districts for all approved special education expenditures in the prior year. While this policy review is focused on 2017-18 policies, it should be noted that the Wyoming legislature has recently capped reimbursements at 2018-2019 levels.	Actual	(Actual counts via reimbursement)		

Appendix 7. Interview, focus group, and observation protocols

IEP Team Interview Protocol

MSDE IEP Study, 2019

Date:

School:

Facilitator Name:

Student Name, Grade, and ID Number:

Thank you for taking time to participate in this interview today. I am with WestEd, a research, service, and development organization. WestEd was hired by MSDE to study the IEP process for the State Legislature. We are very interested in your thoughts about the IEP process in your school.

Your participation is voluntary, and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study. Our questions are designed to elicit discussion.

We would like to record this session to make sure we capture your input well. The recording will be deleted after a transcript is generated. We will remove all identifying information from the transcript. If we use any quotes, we will not identify the person or the LSS. Do you have any questions or concerns about this? Is this OK with you? Raise your hand if you are not OK with us recording this session.

1. In general, how well did that meeting go?
2. How closely did the meeting follow the MSDE IEP Process Guide?
3. What role did the parents play? Observer/Provider of information/Decision maker
   Notes on parent role:
4. Classroom teacher (s), what role did you play? Observer/Provider of information/Decision maker
   Can you describe, generally, your purpose in the IEP team meeting?
5. Notes on general education teacher role:
6. Talk about messages, spoken and unspoken, that were conveyed to parents. What was constructive? What, if anything, was contentious? Was anything said that helped validate parents' input?
7. Was language used that resulted in a mutual understanding of issues?
8. What was the tone of the meeting? How did this affect parent participation?
9. Did you observe any practices that you would recommend as a best practice in the IEP process?
10. Generally, how can the IEP process be improved, streamlined, made more effective?

Special Education Director Program and Fiscal Interview Protocol

Maryland State Department of Education IEP Study

Thank you for taking time to participate in this interview today. I am with WestEd, a research, service, and development organization. WestEd was hired by MSDE to study the IEP process for the State Legislature. We are very interested in your thoughts about your school system budget and special education costs.

Your participation is voluntary, and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study. Our questions are designed to elicit discussion.

We would like to record this session to make sure we capture your input well. The recording will be deleted after a transcript is generated. We will remove all identifying information from the transcript. If we use any quotes, we will not identify the person or the LSS. Do you have any questions or concerns about this? Is this OK with you if we record this session?

District level:

Interview as a group or individually:

- special education director and
- individual(s) who knows the special ed budget in detail and the process for allocating resources and staff to schools (CFO, business manager, special ed accountant-type- person)

Background

1. What do you think is the general attitude and belief of the administration and teachers in this school system regarding teaching students with disabilities?
2. What is your school system doing well to meet the needs of students who receive special education?
3. What could you be doing better, and what support do you need to accomplish that?

Funding and Allocation of special education resources and staff

1. How well is special education funded in Maryland?
    a. What is the basis for your response?
    b. What additional needs do you see?

   c. What, if any, special education needs go unmet?
2. What funds sources make up the special ed budget each year? Describe the funds your LSS has available to provide special education and how the amount is determined.
   a. Federal, IDEA, other? Medicaid? Impact aid, other?
   b. State?
   c. Local?
3. How do you develop the special education budget each year?
   a. What costs are in your budget? (i.e. staff, materials, supplies, technology, contracted services)
   b. What is in the school budgets?
4. How are special education resources and staff allocated/assigned to schools? (Ask them to walk you through highlights of their staffing plan.)
   a. What process do you use?
   b. Who is involved in the process?
   c. What is included in those resources?
   d. Who has final say/approval of amounts and Full time Equivalents (FTEs)?
5. Do schools feel like they have enough funds for special education?
   a. If no, what do they feel they need?
   b. Who do you hear this from? (i.e. teachers, principals, LEA rep)
6. Discuss the process MSDE uses to provide federal discretionary funds (i.e. extra funds in addition to the flow through formula funds) to school systems:
   a. Do you apply for those funds? If yes, what have you been able to accomplish with it? If no, why do you not apply for some of the discretionary funds?
   b. What have you been able to accomplish with it?
   c. How can the purpose or process be improved?
7. If there are needs you cannot meet, what do you need to meet those needs?
8. What is your biggest question or concern with funding of special education services and supports?
9. What do you want the general assembly and MSDE to know about your special education funding needs?

Family Support Services

1. MSDE provides funds for family support services.
   a. What are you able to do with those funds?
   b. How do you allocate the funds?
   c. What services do you provide to families and staff with these funds?
   d. Do you supplement them – if so, how much, and what funding source do you use?
2. How do parents learn about these services?

3. Are the services being used to their full potential?
4. Are you able to meet the needs of families through these services?

Strategic Plan

1. How familiar are you with the strategic plan and what has been its impact on your school system overall?
2. To what extent is MSDE funding and/or TA helping to build your local capacity to meet the goals of the strategic plan in these specific areas? How is it going? What kind of help do you need?
    a. Family support services
    b. Secondary transition
    c. Access, equity and progress – What about significant disproportionality, achievement gap?

(If there is a finance-specific person, it is OK for that person to leave now, or stay.)

Professional Development

1. Let's talk about professional learning from the state.
    a. What have you received this year? What was the goal? To what extent has it been helpful?
2. What is your process for implementing MSDE's imperatives and expectations locally?
3. How effective is the TA, including written resources, from MSDE provided to support school staff in helping parents understand their roles and responsibilities in the IEP process?
4. Can you provide specific examples of what's been most helpful?
5. Talk specifically about Maryland Learning Links
    a. What, if anything, could be improved about this TA?

Administration of Special Education

1. Best practices in the IEP process
2. What are the challenges you face related to recruitment and retention of special education staff?
    a. What positions are particularly difficult to fill with qualified personnel?
    b. What have you done to address staff shortages?
3. If you could design an ideal way to educate students who receive special education, what would it look like?
4. Specifically, how can the administration of special education and the IEP process be improved, made more effective, or streamlined?

Advocates (Small Group or Individual) Protocol

Maryland State Department of Education IEP Study

Thank you for taking time to participate in this interview today. I am with WestEd, a research, service, and development organization. WestEd was hired by MSDE to study the IEP process for the State Legislature. We are very interested in your thoughts about the IEP process in your school.

Your participation is voluntary and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study. Our questions are designed to elicit discussion.

We would like to record this session to make sure we capture your input well. The recording will be deleted after a transcript is generated. We will remove all identifying information from the transcript. If we use any quotes, we will not identify the person or the organization. Do you have any questions or concerns about this? Is this OK with you?

Background Questions

1. What do you think is the general attitude and belief of the administration and teachers in Maryland regarding teaching students with disabilities?
2. What is Maryland doing well to meet the needs of students who receive special education?
3. What could be better, and what needs to happen to accomplish that?
4. What are the trends you are seeing in special education in Maryland? Please discuss both encouraging trends and concerning trends.
5. What was the impetus for this study?

Parent Engagement

1. How effective is the TA from MSDE provided to support school staff in helping parents understand their roles and responsibilities in the IEP process?
    a. Can you provide specific examples of what's been most helpful?
2. Talk specifically about Maryland Learning Links
    a. What, if anything, could be improved about this TA?
3. Talk about the role of LSS family support services. MSDE provides funding for this service. Is this an effective way to support families in understanding their role and responsibilities in the IEP process? How could this be improved?
4. MSDE also has family support services within their conflict resolution division. Is this an effective way to support families in understanding their role and responsibilities in the IEP process? How could this be improved?

5. What do you know about other resources MSDE offers to support families?

MSDE Leadership and TA

1. To what extent is the MSDE special education strategic plan helping to build capacity to provide special education? Talk about both the funding and technical assistance.
    a. Family support services
    b. Secondary transition
    c. Access, equity and progress
2. How is it going? What kind of help do school systems need? What about significant disproportionality, achievement gap?

Funding

1. What is your understanding of how special education resources and staff are allocated? From the state to LSSs? From the LSSs to schools?
2. How well is special education funded in Maryland?
    a. What is the basis for your response?
    b. What additional needs do you see?
    c. What, if any, special education needs go unmet?

The IEP Process and Administration of Special Education

1. How can the administration of special education and the IEP process be improved, made more effective, or streamlined?
    a. Clarification needed
    b. Cost effectiveness:
        i. Administrative goals and objectives
        ii. Strategies of teachers and IEP teams
        iii. Service delivery, caseloads
        iv. Recordkeeping
2. What is working well in Maryland's IEP process?
    a. Share particular best practices you've seen in the IEP process
3. What is not working well?
    a. What needs to happen for it to go better?

IEP Chair Interview (Small Group or Individual) Protocol

Maryland State Department of Education IEP Study

Thank you for taking time to participate in this interview today. I am with WestEd, a research, service, and development organization. WestEd was hired by MSDE to study the IEP process for the State Legislature. We are very interested in your thoughts about the IEP process in your school.

Your participation is voluntary and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study. Our questions are designed to elicit discussion.

We would like to record this session to make sure we capture your input well. The recording will be deleted after a transcript is generated. We will remove all identifying information from the transcript. If we use any quotes, we will not identify the person or the LSS. Do you have any questions or concerns about this? Is this OK with you? Raise your hand if you are not OK with us recording this session.

Background Questions

1. What do you think is the general attitude and belief of the administration and teachers in this school regarding teaching students with disabilities?

IEP Development

1. Describe the process in this school for intervening when a child first starts to struggle academically, socially, behaviorally.
2. Describe the process for referring a child for possible special education services.
3. Describe the IEP development process in your school.
4. How are your school's parents involved in the IEP development process?
5. How do your school's parents learn about their role and responsibilities in the IEP process and their child's education?
6. How would you describe parents' expectations of the IEP process and special education? Probe: Does this differ depending on the type or severity of the disability, parents' education and family income levels, parents' ability to speak English, or any other factor?

IEP Implementation and Monitoring

1. What beliefs, policies, or practices help ensure students with disabilities in this school receive specially designed instruction and services as specified on their IEPs?
2. What beliefs, policies, or practices interfere with students with disabilities in this school receiving specially designed instruction and services as specified on their IEPs?

3. How do you know whether a student is making progress on goals and objectives specified in their IEP?
4. How do you monitor whether a student is making progress on goals and objectives specified in their IEP?

Professional Development and Support

1. How would you describe the level and types of support you received this school year to meet the needs of students with disabilities?
2. Do you have any suggestions for streamlining or otherwise improving effectiveness and efficiency of special education processes?

Closing Questions

1. How well is special education funded in this school?
    a. What is the basis for your response?
    b. What additional needs do you see?
2. If you could design an ideal IEP process, what would it look like? Probe. What would be different from the current process?

IEP Meeting Parent Interview

Maryland State Department of Education IEP Study

Thank you for taking time to participate in this study, which is being conducted by WestEd, a research, service, and development organization. WestEd was hired by MSDE to study the Individualized Education Program (IEP) process for the State Legislature. We are very interested in your thoughts about your child's IEP process. WestEd observed your child's IEP team meeting. This interview is about that meeting and about your child's special education, overall.

Your participation is voluntary and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study.

(Complete this for your interview – record or take good notes)

IEP Process Overall

1. What do you expect to come from your child's education, overall? (Probe for discussion: Hopes and dreams for your child.)
2. How well does special education help to meet this goal? Rate from 1 (IEP does not help my student meet this goal) to 5 (IEP greatly helps my student meet this goal.)
3. What do you expect from special education?
4. How are you actually involved in your child's IEP process.

The IEP Meeting

1. Are you and the other team members on the same page about ’s disability and his/her potential to achieve? How do you know?
2. Was language used that helped everyone understand the issues?
3. What was the tone of the meeting? How did this affect your participation?
4. Was your input heard at the meeting? How do you know?

Knowledge About Special Education

1. List and discuss your rights and responsibilities regarding your child's special education. What is your role on the IEP team?

IEP Implementation and Monitoring

1. How do you know if your student is receiving all services and supports described in their IEP?

Resources

1. Can you name some resources or information you have used to help you understand the IEP process and special education? Do you know who provided the resource/s?
2. Rate each from 1 (not helpful at all) to 5 (very helpful). School resources or information:
    a. Local School System resources or information:
    b. State (MSDE) resources or information:
    c. Other organization's (example - Parents' Place of MD, Disability Law Center, ARC) resources or information:
3. Have you been helped by the family support services coordinator in your school system? Talk about what works and doesn't work with this service?

Closing Question

1. If you could design an ideal IEP process what would it look like? Probe. What would be different from the current process?

Thank you for your participation. We greatly appreciate your input.

Classroom Teacher Focus Group Protocol

Maryland State Department of Education IEP Study

Thank you for taking time to participate in this focus group today. I am with WestEd, a research, service, and development organization. WestEd was hired by MSDE to study the IEP process for the State Legislature. We are very interested in your thoughts, as teachers, about the IEP process in your school.

Your participation is voluntary and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study. Our questions are designed to elicit discussion.

We would like to record this session to make sure we capture your input well. The recording will be deleted after a transcript is generated. We will remove all identifying information from the transcript. If we use any quotes, we will not identify the person or the LSS. Do you have any questions or concerns about this? Is this OK with you? Raise your hand if you are not OK with us recording this session.

(Start recording.) This is the classroom teacher focus group at (school) on (date). We are recording with the permission of this group. Please introduce yourselves with first names.

Background Questions

1. What do you think is the general attitude and belief of the administration and teachers in this school regarding teaching students with disabilities?

IEP Development

1. What happens when a child begins to struggle academically, socially and/or behaviorally in your classroom?
2. Describe the IEP development process in your school.
3. How are you involved in the IEP development process?
4. Probes. What drives the decisions about which services are needed and can be provided for students in this school? What is the basis for determining the least restrictive environment for your students?

IEP Implementation and Monitoring

1. What beliefs, policies, or practices help ensure students with disabilities in this school receive specially designed instruction and services as specified on their IEPs?
2. What beliefs, policies, or practices interfere with students with disabilities in this school receive specially designed instruction and services as specified on their IEPs?

3. How do you know whether a student is making progress on goals and objectives specified in their IEP?

Professional Development and Support

1. How would you describe the level and types of support you receive to meet the needs of students with disabilities in your classroom?
    a. Do you have any suggestions for improvement?
2. What professional development have you received this school year, if any, to help you understand your role in the IEP process, or understand, implement, and monitor an IEP?

Closing Question

1. How well is special education funded in this school?
    a. What is the basis for your response?
    b. What additional needs do you see?
2. If you could design an ideal way to educate students who receive special education what would it look like?

Special Education Teacher and Related Service Focus Group Protocol

Maryland State Department of Education IEP Study

Thank you for taking time to participate in this focus group today. I am with WestEd, a research, service, and development organization. WestEd was hired by MSDE to study the IEP process for the State Legislature. We are very interested in your thoughts, as teachers, about the IEP process in your school.

Your participation is voluntary and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study. Our questions are designed to elicit discussion.

We would like to record this session to make sure we capture your input well. The recording will be deleted after a transcript is generated. We will remove all identifying information from the transcript. If we use any quotes, we will not identify the person or the LSS. Do you have any questions or concerns about this? Is this OK with you? Raise your hand if you are not OK with us recording this session.

(Start recording.) This is the classroom teacher focus group at (school) on (date). We are recording with the permission of this group. Please introduce yourselves with first names.

Background Questions

1. What do you think is the general attitude and belief of the administration and teachers in this school regarding teaching students with disabilities?

IEP Development

1. Describe the process in this school for intervening when a child first starts to struggle academically, socially, behaviorally.
    a. Describe the process for referring a child for possible special education services.
2. Describe the IEP development process in your school.
3. How are your school's parents involved in the IEP development process?
    a. How do your school's parents learn about their role and responsibilities in the IEP process and their child's education?
4. How would you describe parents' expectations of the IEP process and special education? Probe: Does this differ depending on the type or severity of the disability, parents' education and family income levels, parents' ability to speak English, or any other factor?

IEP Implementation and Monitoring

1. What beliefs, policies, or practices help ensure students with disabilities in this school receive specially designed instruction and services as specified on their IEPs?

2. What beliefs, policies, or practices interfere with students with disabilities in this school receiving specially designed instruction and services as specified on their IEPs?
3. How do you know whether a student is making progress on goals and objectives specified in their IEP?

Closing Questions

1. How well is special education funded in this school?
    a. What is the basis for your response?
    b. What additional needs do you see?
2. If you could design an ideal way to educate students who receive special education, what would it look like?

IEP Meeting Observation Protocol

MSDE IEP Study, 2019

Date:

School:

Observer Name:

Student Name, Grade, and ID Number:

Meeting Start Time:

Meeting Location:

Participation: Are required IEP team member present, or if not, are excusals granted through written parent consent and written report is presented? Note who is participating as parent(s) and general education teacher(s).

Student NA Y N(excused) N (not excused)

Parent (s) Y N(excused) N (not excused)

Y N(excused) N (not excused)

General Education Teacher(s) Y N(excused) N (not excused)

Y N(excused) N (not excused)

Y N(excused) N (not excused)

Y N(excused) N (not excused)

Special Education Teacher(s) Y N(excused) N (not excused)

Related Services Providers Y N(excused) N (not excused)

Administrator or IEP Lead Y N(excused) N (not excused)

Evaluator NA Y N(excused) N (not excused)

Other Agency Personnel Y N(excused) N (not excused)

Other Y N(excused) N(not excused)

Did all IEP members who did not attend the meeting submit input in writing? Y N

IEP Process:

2a. IEP team members are introduced Y N

2b. Role of each individual is clear Y N

2c. The purpose, procedures, and possible outcomes of the meeting is clearly articulated for all members Y N

2d. Procedural safeguards were explained to parents. Lead or others verify parent understanding of rights with follow-up questions (beyond "do you understand your rights?) Y N

Review of Progress and Evaluation Data

3a. Provided final progress report for previous IEP goals in writing to parent Y N

3b. Evaluation results are reported and described adequately Y N

PLAAFP

4a. PLAAFPs provide information that can be used by the team to determine educational need and set goals (provides the team with baseline for measuring progress in the general curriculum) Y N

4b. Parents provided opportunity to provide input on present levels of performance Y N

Goals

5a. There is a goal developed for all areas of need identified in PLAAFP. Y N

Describe if needed:

All goals are written as S.M.A.R.T. (specific, measurable, achievable, relevant, time-bound)

Describe:

All goals include a condition, behavior, criteria and measurement.

Describe:

5b. The team considered (verbally or in writing) how each goal would enable the students to make progress in the general education curriculum.

Y N

5c. Parents were invited to provide input Y N

5d. General education teacher(s) were invited to provide input to develop or modify goals Y N

5e. All IEP team members agree that the goals are appropriate. Y N

5f. Goals include specific or observable behavior linked to general curriculum/content standards Y N

Services

6a. Services are linked to goals Y N

6b. Changes in services discussed to address lack of progress or achievement Y N

6c. Increase in intensity of services to address lack of progress or achievement Y N

6d. Services were offered with frequency limits (we only offer speech for 15 minutes twice per week)

Y N

6e. School stated that they don't provide a placement or service requested by the family Y N

Accommodations/Modifications/Supplementary Aids and Services

7a. Participation in statewide assessments including options for revising or adding new accommodations and modifications are discussed Y N

7b. Accommodations are discussed as being used in both daily instruction and testing. Team discusses the location of accommodation (example - oral testing in science and social studies classes) as appropriate.

Y N

7d. Special factors were each discussed so the parents could understand Y N

7e. Extended School Year Services discussed and considered to the parents understanding (parent could re-state reasons for eligibility decision if asked) and satisfaction (parent did not raise any disagreements with the eligibility decision)

Understanding Y N

Satisfaction Y N

Secondary Transition (complete is the child will be age 14 before the next meeting)

8a. If student will be age 14 before the next meeting, transition was included in the purpose of the meeting

NA Y N

8b. Student was invited to the transition meeting NA Y N

8c. Agencies likely to provide or pay for transition services were invited to the IEP meeting NA Y N

8d. Results from an age-appropriate transition assessment were discussed NA Y N

8e. District graduation requirements (diploma vs. certificate) discussed including any needed modifications NA Y N

Placement

9a. Consider the full 'Least Restrictive Environment' continuum given goals and services (if placed outside the general education classroom, discussed at least two different potential placements) Y N

9b. Placement decision is agreed upon by full IEP team YN

Closing

10a. Parents provided a copy of the IEP at the end of the meeting Y N

10b. General education teachers provided a copy of the IEP at the end of the meeting or informed how to obtain a copy Y N

10c. It is clear whom parents should contact with questions or problems Y N

Reflection Questions

11a. What role did the parents play? Observer Provider of information Decision maker

Notes on parent role:

11b. What role did the general education teacher(s) play? Observer Provider of information

Decision maker

Notes on general education teacher role:

11c. What did the manner in which professionals conveyed information reveal about professionals' awareness of the parent's beliefs about disability and their child's potential to achieve?

11d. Was language used that resulted in a mutual understanding of issues?

11e. What was the tone of the meeting? How did this affect parent participation?

11f. Did you observe any practices that you would recommend as a best practice in the IEP process?

Meeting End Time: Meeting Duration:

Principal Interview

Maryland State Department of Education IEP Study

Thank you for taking time to participate in this interview today. I am with WestEd, a research, service, and development organization. WestEd was hired by MSDE to study the IEP process for the State Legislature. We are very interested in your thoughts about your school budget and special education costs.

Your participation is voluntary and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study. Our questions are designed to elicit discussion.

We would like to record this session to make sure we capture your input well. The recording will be deleted after a transcript is generated. We will remove all identifying information from the transcript. If we use any quotes, we will not identify the person or the LSS. Do you have any questions or concerns about this? Is this OK with you? Raise your hand if you are not OK with us recording this session.

1. What is your school doing well to meet the needs of students who receive special education?
    a. What could you be doing better, and what support do you need to accomplish that?
2. What are the challenges you face related to recruitment and retention of special education staff?
    a. What positions are particularly difficult to fill with qualified personnel?
    b. What have you done to address staff shortages?
3. How can the administration of special education and the IEP process be improved, made more effective, or streamlined?
4. What resources are you provided to support special education in your school?
    a. Federal IDEA funds, State funds, Other?
5. Are the resources (staff, related services, as well as materials, supplies) adequate?
    a. Why or why not?
    b. Do you have to find other funds for special education? How often?
6. Do you have any options if more funds/resources are needed to support the special education program or even an individual student?
7. As the Principal, please describe how you balance responding to parent/family requests for more services or different services with constraints on the resources available to provide these services?"
8. Is special education adequately funded?
9. Are there changes you would like to see? What and why?
10. What is your biggest question or concern with funding of special education services and supports?

MSDE State-Level Staff Interview Protocol

Thank you for taking time to participate in this interview today. I am with WestEd, a research service and development organization. WestEd was hired by MSDE to study the IEP process for the State Legislature. We are very interested in your thoughts about the IEP process in the local school systems and public agencies across the state.

Your participation is voluntary and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study.

With your permission we would like to record this interview. The recording will be deleted after a transcript is generated. All identifying information will be removed from the transcripts. Do you have any questions or concerns? Is it ok if we record this session?

Background Questions

1. What are your primary responsibilities?
    a. What is your role in relation to the IEP process? -
2. What support do you provide to LSSs and Public Agencies?

Family Support Services

1. What supports and information are provided to parents to help them navigate the IEP process, including parents of students with disabilities who are new referrals, ages 3-6, and secondary transition students?
    a. What do you see as best practices and challenges to supporting families?
    b. Are there LSSs/public agencies in which parents participate at a high level or a low level?
    c. What types of issues do families raise through the dispute resolution processes?
    d. What are the strengths and barriers to active parent participation in their child's education?
2. Are special education family support services provided by all LSS/public agency staff members?
    a. In your experience, to what extent are LSS staff providing family support services?
    b. Is there a process to monitor the provision of LSS family support services? Who is involved in that process? How is the information used?
3. In your experience, who else is providing family support services and how do families access those supports (Probe, please name them (examples if needed – private advocates, MCEDs, etc.))?
    a. In your experience, are there government agencies or other organizations outside of the LSSs and MSDE providing information to parents to assist in the IEP process?

b. What role do you think these outside entities play in facilitating family involvement in the IEP process?
c. In your experience does information about these organizations, access to or use of their services differ by race/ethnicity, income, limited English/Immigrant parents, or regions/LSS?
d. Are there instances where outside agency information or misinformation shared among parents may create challenges for the IEP process?

IEP Process

1. What do you think are the strengths and challenges of the IEP process in Maryland?
    a. How are special education services contributing or not contributing to narrowing the achievement gap for students with disabilities?
    b. In your experience, how do IEP teams respond when an individual child is not progressing toward their IEP goals or demonstrating expected achievement?
    c. Who are the primary decision-makers about types and amounts of services? What efforts do you make to involve parents and general education teachers in those decisions?
    d. Are there any differences for early childhood, access and equity, secondary transition?
    e. Which LASs, if any, do you think are excellent or struggling with the IEP process? What factors do you think contribute to their excellence or struggles?
    f. How is the referral process working? (probe: strengths and challenges)
    g. How is the dispute resolution working? (probe: strengths and challenges)
2. In your experience, how active are parents in the IEP process?
    a. Are there LSSs/public agencies in which parents participate at a high level or a low level?
    b. What are the supports for and barriers to active parent participation?
    c. What do you think needs to happen to ensure parents are active partners in the IEP process?
3. To what extend do you think LSSs/public agencies use TA provided by MSDE to assist parents in understanding their rights and responsibilities in the IEP process? What is the basis for your response?

Costs

1. Do you think that special education funds are being spent cost effectively in Maryland public schools?
    a. What do you think should be done differently, if anything?
2. Which LLSs/public agencies do you think are excellent or struggling with use of special education funding?

   a. What primarily contributes to their excellence or struggles?
3. How do all LSSs/public agencies allocate and use their teaching and family support services staff?
   a. Which LLSs/public agencies, if any, do you think are excellent or struggling with the allocation and use of staff?
   b. What primarily contributes to their excellence or struggles?
4. To what extent do LSSs/public agencies use partnerships to help with access to IEP-related and family support services?
   a. How is this different for early childhood and transition?
   b. How effective are these partnerships? Which factors lead to their success or failure?
5. To what extent do you think LSSs/public agencies are effectively allocating their teaching and family support services staff to improve the education achievement of special education students?

Partner Agency Questions (DORS, DDA, etc. only)

1. Please outline the partnerships that you have with MSDE to facilitate the IEP process, school readiness, and youth transition.
   a. What are the strengths and challenges you see in these partnerships?
   b. Does their effectiveness vary across LSS/public agencies or regions? If so, how and why?
   c. To what extent, if any, does race/ethnicity, income, limited English/immigrant families influence the effectiveness of these partnerships?

Closing Questions

1. If you could design an ideal IEP process for Maryland, what would it look like? What would be the role of your agency in the process?
   a. Are there specific improvements or changes you would suggest?
2. Is there anyone else you think it would be particularly important for us to interview to understand the IEP process?

Alternate Question if Time Remaining:

1. Based on your experience, does MSDE, LSSs, and/or the public agencies partner with anyone to develop and implement IEPs? If so, describe any current partnerships of which you are aware. What do you see as the benefits of those partnerships?
   a. Are there different partnerships for students at the pre-K and transition level?
   b. What is the nature of these partnerships? Is the nature of these partnerships different for pre-K or transition?

   c. To what extent are they effective? Are you aware of any challenges with these partnerships at the state level or in any LSSs/public agency or regions?
2. Are you aware of any partnerships that are no longer in effect but that were particularly effective?
   a. (If yes): are there any lessons learned from those past partnerships that could improve the current IEP process? Do you know why they were discontinued?

Special Education Directors Focus Group Protocol

Maryland State Department of Education IEP Study

Thank you for taking time to participate in this focus group today. I am with WestEd, a research service and development organization. WestEd was hired by MSDE to study the IEP process for the Maryland State Legislature. We are very interested in your thoughts about the IEP process in your school systems and public agencies.

Your participation is voluntary and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study from many different groups. Also, since we are trying to understand similarities and differences across school districts, please state the name of your LSS or agency when you speak. Our questions are designed to elicit discussion.

With your permission we will record this interview. The recording will be deleted after a transcript is generated. All identifying information will be removed from the transcripts. Do you have any questions or concerns? May we proceed with recording this interview?

Background: (5 minutes, includes time to settle)

1. How long have you been in your current position? Your current LSS or public agency?

Family Support Services (7 minutes)

1. What supports and information does MSDE provide for parents about the IEP process, including parents of pre-school students with disabilities, ages 3-5, and secondary transition students?
2. How do parents typically get MSDE or other support and information?
3. What is the quality, relevance and usefulness of the MSDE resources?
4. What do you see as best practices and challenges to supporting families?

IEP Process (20 minutes)

1. What would you say are the greatest strengths and challenges of the IEP process in your LSSs/agencies?
    a. Are there any differences for early childhood or secondary transition students?
2. Are there particular challenges in the IEP process regarding access and equity, as defined in the MSDE Closing the Gap strategic plan?
3. In your experience, how active are parents in the IEP process?
    a. What are the supports for and barriers to active parent participation?
    b. What do you think needs to happen to ensure parents are active partners in the IEP process?

4. What technical assistance, training, or guidance have you or your school staff received from MSDE this school year?
    a. In what areas did you receive support? (IEP process, assisting parents, other)
    b. How helpful do you find this training? Is this new information used on a regular basis?
    c. What additional training, if any, do you think would be helpful?

Costs (5 minutes)

1. How do you think that special education funding and costs affect the IEP process?

Closing Questions (8 minutes)

1. If you could design an ideal IEP process, what would it look like? Probe. How would that be different from current practice?
    a. Are there specific improvements or changes you would suggest?
    b. What are some best practices you've seen in the IEP process? Where are these happening?
2. Does the LSS/ Public Agency engage interagency partners in the IEP process? If so, describe any current partnerships of which you are aware.
    a. What is the nature of these partnerships? Is the nature of these partnerships different for pre-K or transition?
    b. What do you see as the benefits of those partnerships? To what extent are they effective? Are there any challenges with these partnerships?

Transition Coordinators Focus Group Protocol

Maryland State Department of Education IEP Study

Thank you for taking time to participate in this focus group today. I am with WestEd, a research service and development organization. WestEd was hired by MSDE to study the IEP process for the State Legislature. We are very interested in your thoughts about the IEP process in your school systems and public agencies.

Your participation is voluntary and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study. Also, since we are trying to understand similarities and differences across regions and school districts, please state the name of your region, LSS or Public Agency when you speak. Our questions are designed to elicit discussion.

With your permission we would like to record this focus group. The recording will be deleted after a transcript is generated. All identifying information will be removed from the transcripts.

Community Culture and Expectations for Transition

1. Think about the transition age students with IEPs in your district. What kind of future does the community and the students' families see for these students after they finish high school?
    a. (Follow up) Does that differ depending on the type or severity of disability? Race/ethnicity? Income or parents' education level? Geographic location of the community?
2. What are your own expectations about potential futures for the students with IEPs in your district?

Transition Process

1. In general, how does the secondary transition process in your [LSS/(name of specific public agency)] prepare students with disabilities for their future? (Follow up) What age do you start? How do transition plans change, if at all, as students near high school completion?
2. What options are available to prepare students with disabilities for employment or post-secondary education/training?
    a. Describe the involvement of partners like government, local colleges, private agencies or business in supporting students' transition?
3. How do secondary schools in your LSS involve families in the secondary transition process? How do parents' expectations shape the transition process?
4. In what ways do secondary schools in your LSS work with the adult disability services system (DORS, DDA, coordinators of service, local agencies) to help youth and families understand this

system and facilitate the transition process? (Follow up if needed) What are the successes and challenges?

5. What support does MSDE provide to you to your LSS to assist families?
    a. (Follow up) Are there any specific resources, materials, and tools MSDE has provided? If so, how were they provided? (Master plan: Secondary Transition, Family Partnerships)
    b. What data, if any, do you use to determine progress or success? How has your State-level secondary transition Liaison assisted you with making data- informed decisions? (Master plan: Secondary Transition, Data Informed Decision Making)

Wrap Up

1. What do you think are the current strengths and challenges of the transition IEP process, transition plans and transition services? What suggestions do you have for improvements?

Family Support Services Coordinators Protocol

Maryland Study of the IEP Process

Pre-questionnaire

Please respond to the questions 1 – 3 on this page in preparation for the afternoon focus group. The focus group is part of a special education study Maryland is conducting. Providing your responses to questions 1-3 on this page prior to the meeting will allow for a better discussion.

During and after the focus group, if you have something more to say, please jot it down by the applicable question. After the meeting, please give your completed questionnaire to the evaluation team. If you have to leave early, please leave your questionnaire face-down on the registration table.

Background Questions

1. Please share your name and Local School System here:
2. How many years have you been a Family Services Coordinator?
    a. What school district do you work in now?
3. For how many of those years have you been a Family Services Coordinator in your current school district?
    a. Approximately how many families have you supported during the 2018-2019 school year?

Focus Group Protocol Opening Notes and Instructions

Thank you for taking time to participate in this group discussion today. We are with WestEd, a research, service, and development organization. WestEd was hired by MSDE to study the IEP process for the State Legislature. We are very interested in your thoughts about the IEP process in your school.

If you have not already done so, please fill out the questionnaire that was handed out earlier. If you have any comments that we don't have time to share, please note them on the form during our session. Please turn those forms in at the end of the focus group.

Your participation is voluntary and you may stop at any time. Your responses are confidential and will only be available to the WestEd research team. Your responses will be summarized and reported with other information on the same topics that we collect during this study. Our questions are designed to elicit discussion.

With your permission we would like to record this session. The recording will be deleted after a transcript is generated. We will remove all identifying information from the transcripts.

Background Question

1. What do you think is the general attitude and belief of your school district and community regarding teaching students with disabilities?

Roles and Functions

1. Describe your primary roles and functions as a district Family Services Coordinator.
    a. What types of support do you provide to families?
    b. How do you decide what type of support to provide?
    c. How do you keep track of the support you provide?
    d. What practices seem to be the most effective?

Professional Development and Support

1. How would you describe the level and types of support you receive from your school district to support families?
2. Describe district professional development provided to you on family support and/or the IEP process.
3. How would you describe the level and types of support you receive from MSDE to support families?
4. Describe MSDE professional development provided to you on family support and/or the IEP process.

Reflections on the IEP Process

1. What about the IEP process is working well for Maryland families?
2. If you could design an ideal IEP process, what would it look like? Probe. How would that be different from current practice?

Thank you! We value and appreciate your responses.

Appendix 8. MSDE technical assistance

The following list is adapted from the 2018-19 Calendar of Events for Universal Engagement, Birth-21 for the Division of Early Intervention and Special Education Services (DEI/SES), by topic of event as of July 12, 2019. This is not a comprehensive list of the technical assistance provided and does not reflect ongoing individualized technical assistance for each LSS.

Access, Equity, Progress (AEP) Professional Learning Opportunity – Region 4, January 9, 2019, 8:30a-3:30p

Access, Equity, Progress (AEP) Professional Learning Opportunity – Region 5, January 11, 2019, 8:30a-3:30p

Access, Equity, Progress (AEP) Professional Learning Opportunity – Region 1, January 15, 2019, 8:30a-3:30p

Access, Equity, Progress (AEP) Professional Learning Opportunity – Region 2, January 16, 2019, 8:30a-3:30p

Access, Equity, Progress (AEP) Professional Learning Opportunity – Region 3, January 22, 2019, 8:30a-3:30p

Access, Equity, Progress (AEP) Statewide Post-PLO Webinar #1: A Closer Look: SDI Co-Development, February 5, 2019, 10-11a

Access, Equity, Progress (AEP) Statewide Post-PLO Webinar #2: A Closer Look: SDI Co-Implementation, February 27 201,9 10a-11a

Access, Equity, Progress (AEP) Statewide Post-PLO Webinar #3: A Closer Look: SDI Co-Evaluation (Rescheduled from March 14), May 13, 2019, 2-3p

Access, Equity, Progress (AEP) Statewide Pre-PLO Webinar, November 28, 2018, 10-11a

Accountability for Assessments Webinar for Local School Systems, September 18, 2018, 10-11a

Alt-Assessment Statewide Conference – Math – Local Participation Option 1, Frederick Md, March 5, 2019, 8a-4p

Alt-Assessment Statewide Conference – Math – Local Participation Option 2, Annapolis Md, March 6, 2019, 8a-4p

Alt-Assessment Statewide Conference – Writing – Local Participation Option 2, Frederick Md, October 24 201,8 8a-4p

Alt-Assessment Statewide Conference – Writing – Local Participation Option 1, Annapolis Md, October 25, 2018, 8a-4p

Annual Determinations Webinar: Assistant State Superintendent with Local Leaders, Birth-21, August 8, 2018, 9-10a

Annual Fiscal-Programmatic Meeting for Local School Systems, Local Lead Agencies, and Public Agencies, Birth-21, March 13, 2019, 9a-4p

Annual Fiscal-Programmatic Webinar for Non-LSS and Institutes of Higher Education Partners, March 27, 2019, 9a-12p

Annual Legal Aspects Updates in Early Intervention and Special Education, with Art Cernosia for Local Leaders, Birth-21, April 4, 2019, 9:30a-3:30p

Annual Legislative Session Outcomes Webinar for Local Leaders, Birth-21 (Rescheduled from April 10, 10am), April 12, 2019, 10a-12p

Assistant State Superintendent Advisory Council of Local Leaders, Birth-21 – Fiscal-Programmatic Workgroup Teleconference, February 15, 2019, 2-3:30p

Assistant State Superintendent DRM Meeting: Disability Rights Maryland, February 12, 2019, 10-11a
Assistant State Superintendent EAC Meeting: Education Advocacy Coalition, September 13, 2018, 10a-12p
Assistant State Superintendent EAC Meeting: Education Advocacy Coalition, December 6, 2018, 10a-12p
Assistant State Superintendent One-On-One with Local Leaders, Conversations for Solutions with Directors of Special Education, August 6 201,8 8:30a-3:30p
Assistant State Superintendent One-On-One with Local Leaders, Conversations for Solutions, Birth-21, April 25, 2019, 8a-4p
Assistant State Superintendent Open House for NEW Early Intervention and Special Education Leaders, Birth-21, August 13, 2018, 10a-12p
Assistant State Superintendent Presentation to the Maryland State Board of Education, March 26, 2019, 9a-4:30p
Assistant State Superintendent Updates Webinar for Local Leaders, Birth-21: Legislation, IEP Team/Alt-Assessments, February 13, 2019, 2-3:30p
Assistant State Superintendent Advisory Council of Local Leaders, Birth-21 – SPP/APR, PLC, Micro-credentialing for IEP Chairs, August 6, 2019, 10-11:30a
Assistant State Superintendent Updates Webinar, Birth-21: Transition Planning, Comprehensive Monitoring, Part B Family Survey Data, August 20, 2018, 10-11:30a
Assistant State Superintendent's Advisory Council of Local Leaders, Birth-21, September 17, 2019, 9-11a
DEI/SES Division Meeting for All Staff – School Year Kick Off, September 5, 2018, 1-3:30p
DEI/SES Division Meeting for All Staff – Winter Update, February 14, 2019, 1-3:30p
DEI/SES Division Meeting for All Staff –Summer Update (Previously scheduled for May 15), June 18, 2019, 1-3:30p
DEI/SES Division Meeting for All Staff – School Year Kick Off, September 18, 2019, 1-3:30p
Early Childhood (EC) Personnel Standards – Recorded Webinar Release, February 20, 2019, 9a-10a
Early Childhood (EC) Professional Learning Opportunity – Region 1, December 11, 2018, 8:30a-3:30p
Early Childhood (EC) Professional Learning Opportunity – Region 2, December 12, 2018, 8:30a-3:30p
Early Childhood (EC) Professional Learning Opportunity – Region 3, December 13, 2018, 8:30a-3:30p
Early Childhood (EC) Professional Learning Opportunity – Region 4, December 5, 2018, 8:30a-3:30p
Early Childhood (EC) Professional Learning Opportunity – Region 5, December 7, 2018, 8:30a-3:30p
Early Childhood (EC) Professional Learning Opportunity – Snow Date, December 18, 2018, 8:30a-3:30p
Early Childhood (EC) Statewide Post-PLO Webinar, TBD 2019, 10-11a
Early Childhood (EC) Statewide Pre-PLO Webinar, October 31, 2018, 10-11a
Family Support Services Coordinators Annual Statewide Meeting, May 8, 2019, 9a-3pm
Family Support Services Coordinators Fall Regional Meeting in Cecil County, October 2, 2018, 9a-12p
Family Support Services Coordinators Fall Regional Meeting in Dorchester County, October 4, 2018, 9a-12p
Family Support Services Coordinators Fall Regional Meeting in Prince George's County, September 25, 2018, 9a-12p
Family Support Services Coordinators Fall Regional Meeting in Western Maryland, September 27, 2018, 9a-12p
Family Support Services Coordinators Spring Regional Meeting – Region TBA, March 21, 2019 9a-12p
Family Support Services Coordinators Spring Regional Meeting – Region TBA, March 27, 2019 9a-12p
Family Support Services Coordinators Spring Regional Meeting – Region TBA, April 1, 2019 9a-12p
Family Support Services Coordinators Spring Regional Meeting – Region TBA, April 16, 2019 9a-12p

Statewide Birth-21 PROFESSIONAL LEADERSHIP CONFERENCE, November 5, 6, and 7, Clarion Resort, Ocean City, November 5, 2019, 8a-4p
Local Implementation Lessons Learned in All 3 Imperatives: EC/ST/AEP – Region 5, March 29, 2019, 8:30a-3:30p
Local Implementation Lessons Learned in All 3 Imperatives: EC/ST/AEP – Region 1, April 1, 2019, 8:30a-3:30p
Local Implementation Lessons Learned in All 3 Imperatives: EC/ST/AEP – Region 2, April 2, 2019, 8:30a-3:30p
Local Implementation Lessons Learned in All 3 Imperatives: EC/ST/AEP – Region 4, April 8, 2019, 8:30a-3:30p
Local Implementation Lessons Learned in All 3 Imperatives: EC/ST/AEP – Region 3, April 9, 2019, 8:30a-3:30p
Maryland Common Ground Convention DEI/SES Presentation: Moving Maryland Forward - EC/ST/AEP, (May 1-3, 2019) May 1, 2019, NA
Medicaid Services Coordinators Statewide Fall Workshop, October 25, 2018, 9:30a-12:30p
Medicaid Services Coordinators Statewide Spring Workshop (Previously scheduled for May 16), May 10, 2019, 8:30a-12p
Nonpublic Education Annual Budget Meeting, May 29, 2019, 9a-1p
Nonpublic Education Local School System Processes and Procedures Fall Training, October 24, 2018, 9a-3p
Nonpublic Education Local School System Processes and Procedures Spring Training (Previously scheduled for March 13), April 24, 2019, 9a-1p
Nonpublic Education New to Special Education Training, September 20, 2018, 9a-3p
Secondary Transition (ST) Professional Learning Opportunity – Region 5, November 1, 2018, 8:30a-3:30p
Secondary Transition (ST) Professional Learning Opportunity – Region 2, November 5, 2018, 8:30a-3:30p
Secondary Transition (ST) Professional Learning Opportunity – Region 4, November 7, 2018, 8:30a-3:30p
Secondary Transition (ST) Professional Learning Opportunity – Region 1, November 8, 2018, 8:30a-3:30p
Secondary Transition (ST) Professional Learning Opportunity – Region 3, November 9, 2018, 8:30a-3:30p
Secondary Transition (ST) Statewide Post-PLO Webinar: Effective Practices in Developing Transition Plans (Previously scheduled for May 7), May 6, 2019, 10-11a
Secondary Transition (ST) Statewide Pre-PLO Webinar, September 26, 2018, 10-11a
SESAC: State Special Education Advisory Committee Meeting, September 20, 2018, 10a-1p
SESAC: State Special Education Advisory Committee Meeting, January 17, 2019, 10a-1p
SESAC: State Special Education Advisory Committee Meeting, March 21, 2019, 10a-1p
SESAC: State Special Education Advisory Committee Meeting, May 16, 2019, 9a-12p
SESAC: State Special Education Advisory Committee Meeting – Joint SESAC/SECAC, December 10, 2018, 10a-2p
SICC: State Interagency Coordinating Council Meeting, October 4, 2018, 1-3:30p
SICC: State Interagency Coordinating Council Meeting, December 6, 2018, 1-3:30p
SICC: State Interagency Coordinating Council Meeting, February 7, 2019, 1-3:30p
SICC: State Interagency Coordinating Council Meeting, June 6, 2019, 1-3:30p
SICC: State Interagency Coordinating Council Meeting – Joint SICC/LICC, May 2, 2019, 10a-2p