



Study to Measure the Delivery of Services in Accordance with the Individualized Education Programs of Students with Disabilities: Year 10 (2012-13)

Submitted to:

Office of the Independent Monitor
333 S. Beaudry Avenue
Los Angeles, CA 90017

Submitted by:

Jenifer Harr-Robins, Ph.D.
American Institutes for Research

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Introduction

AIR's report to the Office of the Independent Monitor (OIM) presents the results from the Year 10 (2012-13) study to measure whether the Los Angeles Unified School District (LAUSD) met the goals of Outcome #13 of the Modified Consent Decree (MCD). Established in 2003, the OIM is the oversight agency of LAUSD's special education program and is responsible for determining whether LAUSD meets compliance with the MCD. Outcome #13 of the MCD states that LAUSD must provide evidence that at least 93% of special education services required by students' Individualized Education Programs (IEPs) were delivered. In addition, 85% of the services must meet the frequency and duration specified in the IEPs.

The study addressed the following three questions:

- (1) Was there evidence of at least one incident of provision for each service specified in the student's IEP over an 8-week/2-month period?¹
- (2) Were student services meeting the criterion specified in Question 1 (i.e., the subset of student services for which there was evidence of at least one incident of valid service provision) provided at the frequency (i.e., the number of times) stated on the IEP?
- (3) Were student services meeting the criterion specified in Question 1 provided for the duration (i.e., the amount of time) stated on the IEP?

For the first question, the outcome examines two student groups: all disabilities combined excluding Specific Learning Disability (SLD) and SLD individually.² The second and third questions examine all disabilities combined.

Using an electronic log system, providers in LAUSD document the delivery of special education services, including the date, duration, and status of each session, to individual students. This study compares the requirements recorded on the students' IEPs to information on these provider logs to address the above questions. To answer the first question, AIR estimated the percentage of services for which at least one valid session was documented on the submitted logs during an 8-week/2-month period between January and March 2013.³ For the frequency and duration questions, AIR compared

¹ An 8-week timeline was used for services occurring on a weekly basis. A full 2-month timeline was used for monthly services to ensure enough time to capture the provision of at least two service sessions.

² Starting with Year 2, the MCD required LAUSD to disaggregate the evidence of service delivery results for the population excluding SLD and for SLD only. Because students with SLD comprise the majority of the special education population, the OIM considered it important to consider this population separately.

³ LAUSD's Office of Data and Accountability developed extensive rules for coding the log information, subject to approval by the OIM, to determine if a given service session was considered as valid, thereby constituting evidence of service provision. For example, in addition to sessions in which the service was provided, instances in which services were not provided due to a field trip, school event, school-wide testing, student no show, student absence, student refusing treatment, provider absence due to jury duty, illness, or personal necessity, or the procedure documented as "not needed" are counted as instances of valid service provision.

the IEP requirements for services (for which there was at least one incident of valid service) to the actual frequency and duration shown on the logs over an 8-week/2-month period.⁴

In Year 1, AIR entered information from the sampled logs and IEPs into a database and analyzed the data in accordance with an initial set of coding rules. In Years 2-5, LAUSD's Office of Data and Accountability compared the IEP-log information by hand, using coding rules that were modified and supplemented by the Office of Data and Accountability in consultation with the OIM. Because the information needed to conduct the analyses were available in electronic form in Years 6-10, AIR created a computer program to analyze the data, which attempted to follow as closely as possible the rules used for the hand-coding process in Year 5.

In Year 10, the Office of Data and Accountability provided AIR with databases containing IEPs for 4,890 students in special education in the district and their corresponding provider log information, if available. Using these databases, the final results include 6,290 services for 4,105 of the students in this sample.⁵ The Office of Data and Accountability staff hand-coded 207 service records because certain school calendars did not align with the track periods selected for the study or had additional holidays not captured by the computer program.⁶

The results of the current study are described in Section I of this report. To further understand service patterns and help identify areas for possible improvement, AIR also conducted exploratory analyses of selected service records that did not meet the frequency or duration requirements (Section II).

⁴ The specific 8-week/2-month period used in this study for each student was determined by the student's school track calendar. Services reported as weekly in the IEP were analyzed across eight weeks, while two full months were used for monthly services.

⁵ The sample of students included in the service estimates (n = 4,105) is smaller than the sample that LAUSD's Office of Data and Accountability provided to AIR (n = 4,890). In accordance with the coding rules, 875 students were dropped due to reasons such as the student leaving the district, exiting special education, attending a non-public school, parents not accessing the student's service, or students whose only service was yearly, whose only service ended before or during the study period or started after the study period, or whose only service was not part of the study.

⁶ Hand-coding was needed for charter schools, because they set their own calendars and do not consistently have the same standard holidays as non-charter schools.

Section I: MCD Study Results

Was there evidence of at least one incident of provision for each service specified in the student's IEP over an 8-week/2-month period?

Based on provider logs for the first group of students included in this analysis (i.e., those with categories of disability other than SLD), we found evidence that 98% of the special education services required by IEPs district-wide⁷ during the 2012-13 school year were provided at least once during an 8-week/2-month period of analysis. This population estimate represents services for students in all disability categories (except SLD) district-wide whose IEPs required at least one special education service.⁸ For the sample of students with SLD whose IEPs required at least one special education service, we also found evidence that 98% of their required services were provided at least once during an 8-week/2-month period. Figure 1 illustrates the percentages of services for which there was evidence of at least one instance of provision by disability category. Figure 2 shows this information by service category across all disability categories combined.

Because these figures are based on a sample of students and not the entire population, we estimated confidence intervals at the 95% level to specify the precision of the service estimates presented above. For the first group of students specified for this outcome (all special education students excluding SLD), these analyses show that with 95% confidence the true service delivery rate for this sub-population falls between 97.7% and 98.6%. For students with SLD, for which the MCD outcome goal is also specified at 93%, we can predict with 95% confidence that the true estimate of provision falls between 96.7% and 98.7%.⁹ Therefore, the confidence intervals for both groups of students are above the MCD outcome goal of 93%.

Across the individual disability categories, the estimate of service delivery ranged from 97% for students with Emotional Disturbance (ED) to 99% for students with Autism (AUT) and students with Visual Impairments (VI). By service category, the percentages varied from 93% for Non-Public Agency (NPA) to 100% for Visual Impairment Itinerant (VI) services.

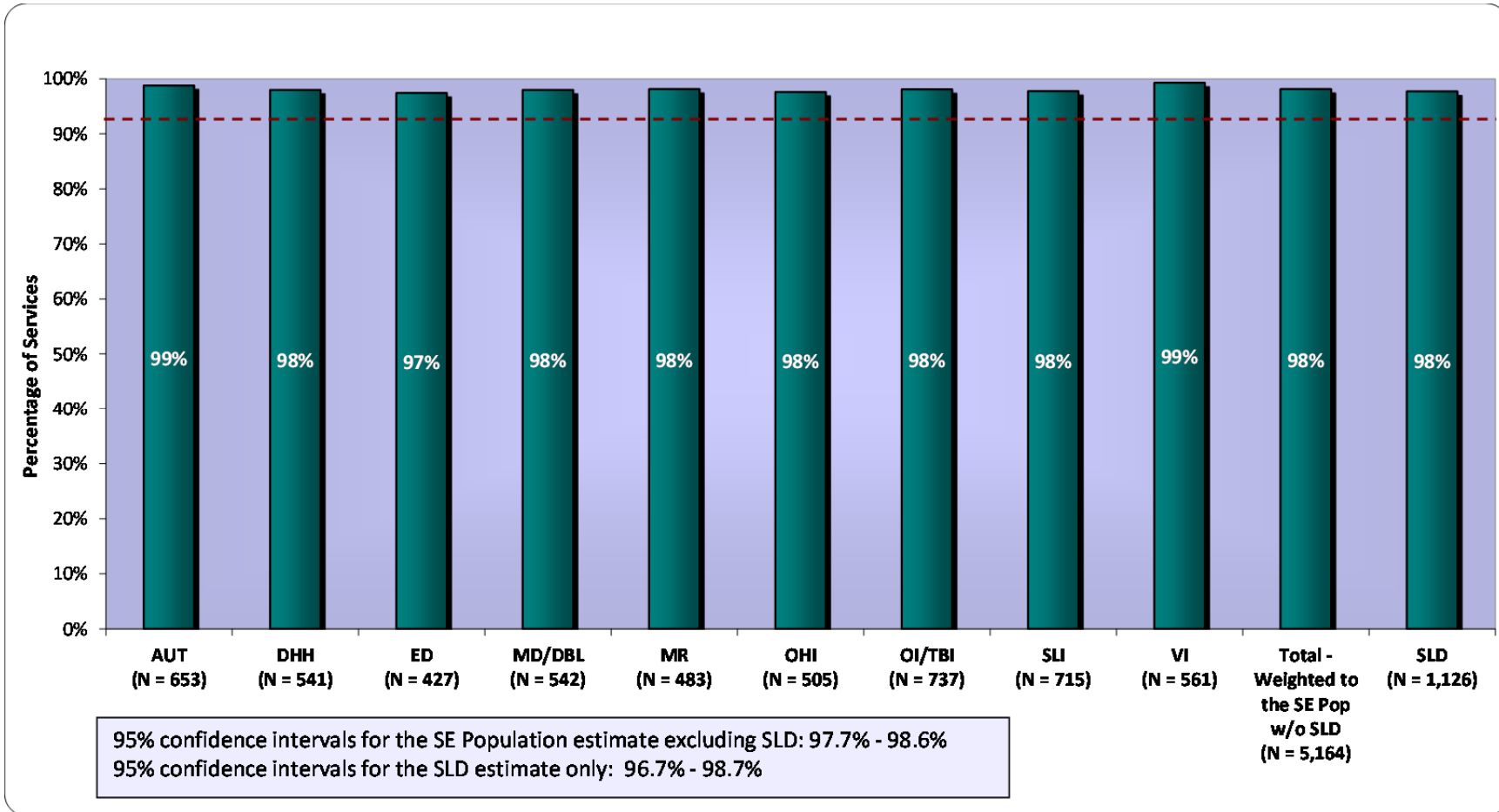
⁷ This is a population estimate based on the probability weights for each disability category, excluding SLD. Please see Appendix A for more details. The population estimate represents students whose IEPs required at least one special education service according to the Special Education Student Information System (SIS) database

⁸ According to the Special Education Student Information System (SIS) database used to draw the study sample, approximately a quarter of all special education students in the LAUSD did not have a service code listed. The population estimate for evidence of service delivery represents only those students (excluding SLD) who had a service code in the SIS database.

⁹ OIM also requested separate service delivery analyses for charter schools based on the students in the sample. For charter schools, we found evidence that 98% of special education services required by IEPs were provided at least once during an 8-week/2-month period, excluding students with SLD (with confidence intervals of 96.9% and 99.3%). For students with SLD in charter schools, we found evidence that 99% of their required services were provided (with confidence intervals of 97.0% and 100%).

FIGURE 1

Percentage of services for which there was evidence of at least one incident of service provision during an 8-week/2-month period, by disability category, 2012-13



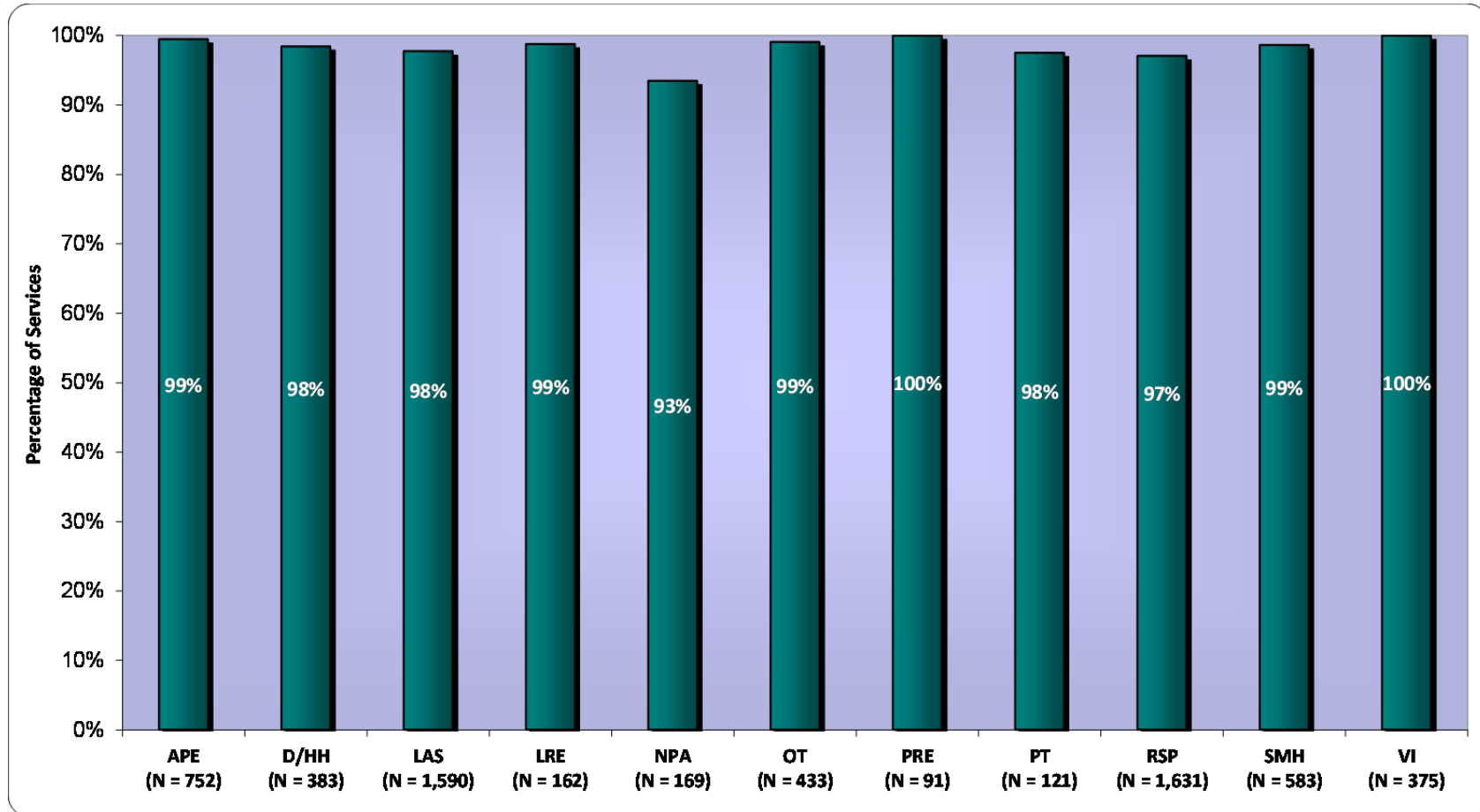
Note 1: The population estimate represents the population of students in special education district-wide (excluding students with Specific Learning Disabilities) whose IEPs required at least one special education service as reported in the Special Education Student Information System (SIS) database.

Note 2: The numbers (N) shown underneath the disability categories represent the total number of services analyzed for that category. For example, we found evidence of service provision for 99% of the 653 services required for the sampled students with Autism.

Abbreviations: AUT (Autism); DHH (Deaf/Hard of Hearing); ED (Emotional Disturbance); MD/DBL (Multiple Disabilities/Deaf-Blindness); MR (Mental Retardation); OHI (Other Health Impairment); OI/TBI (Orthopedic Impairment/Traumatic Brain Injury); SE (Special Education); SLD (Specific Learning Disability); SLI (Speech/Language Impairment); VI (Visual Impairment).

FIGURE 2

Percentage of services for which there was evidence of at least one incident of service provision during an 8-week/2-month period, by service category, 2012-13



Note 1: These percentages include all disability categories receiving those particular services, including students with Specific Learning Disability.

Note 2: The numbers (N) shown underneath the service categories represent the total number of services analyzed for that category. For example, we found evidence of service provision for 99% of the 752 Adapted Physical Education (APE) services required for the sampled students.

Abbreviations: APE (Adapted Physical Education); D/HH (Deaf/Hard of Hearing Itinerant Service); LAS (Language & Speech); LRE (Least Restrictive Environment Itinerant Service); NPA (Non-Public Agency); OT (Occupational Therapy); PRE (Pre-School); PT (Physical Therapy); RSP (Resource Specialist); SMH (School Mental Health); VI (Visual Impairment Itinerant Service).

Were services provided at the frequency and duration required by the IEP?

A second component of this study examined whether the services for which there was evidence of at least one incident of provision over the 8-week/2-month period were provided at the frequency (e.g., 2 times a week) and the duration (e.g., 30 minutes per week) documented in the IEPs. As mentioned above, the MCD outcome goal specifies that 85% of services must meet the frequency and duration stated in the IEPs.

For frequency and duration, the outcome examined all disabilities combined, including SLD. Based on the provider log information, AIR estimates that 86% of services across the population of students in special education with evidence of service (Question 1) met the frequency requirements in 2012-13, with the 95% confidence intervals ranging from 84.8% to 87.1%.¹⁰ Hence, LAUSD met the MCD outcome goal for frequency for the first time during the ten years of this study. For duration, 71% met the IEP specifications, with the confidence intervals ranging from 69.8% to 72.9%, well below the MCD outcome goal of 85%.¹¹

Figure 3 presents this information on frequency and duration by disability category. Figure 4 depicts these data by service type. Estimates for meeting the IEP frequency ranged from 83% for students who were Deaf/Hard of Hearing (DHH) or with Emotional Disturbance (ED) to 92% for students with Visual Impairments (VI). Duration rates ranged from 68% for students with ED or Other Health Impairments (OHI) to 79% for students with DHH. By service category, frequency estimates ranged from 77% for Occupational Therapy (OT) to 96% for Visual Impairment Itinerant (VI) services. Duration estimates ranged from 43% for Non-Public Agency (NPA) to 85% for Physical Therapy services.¹²

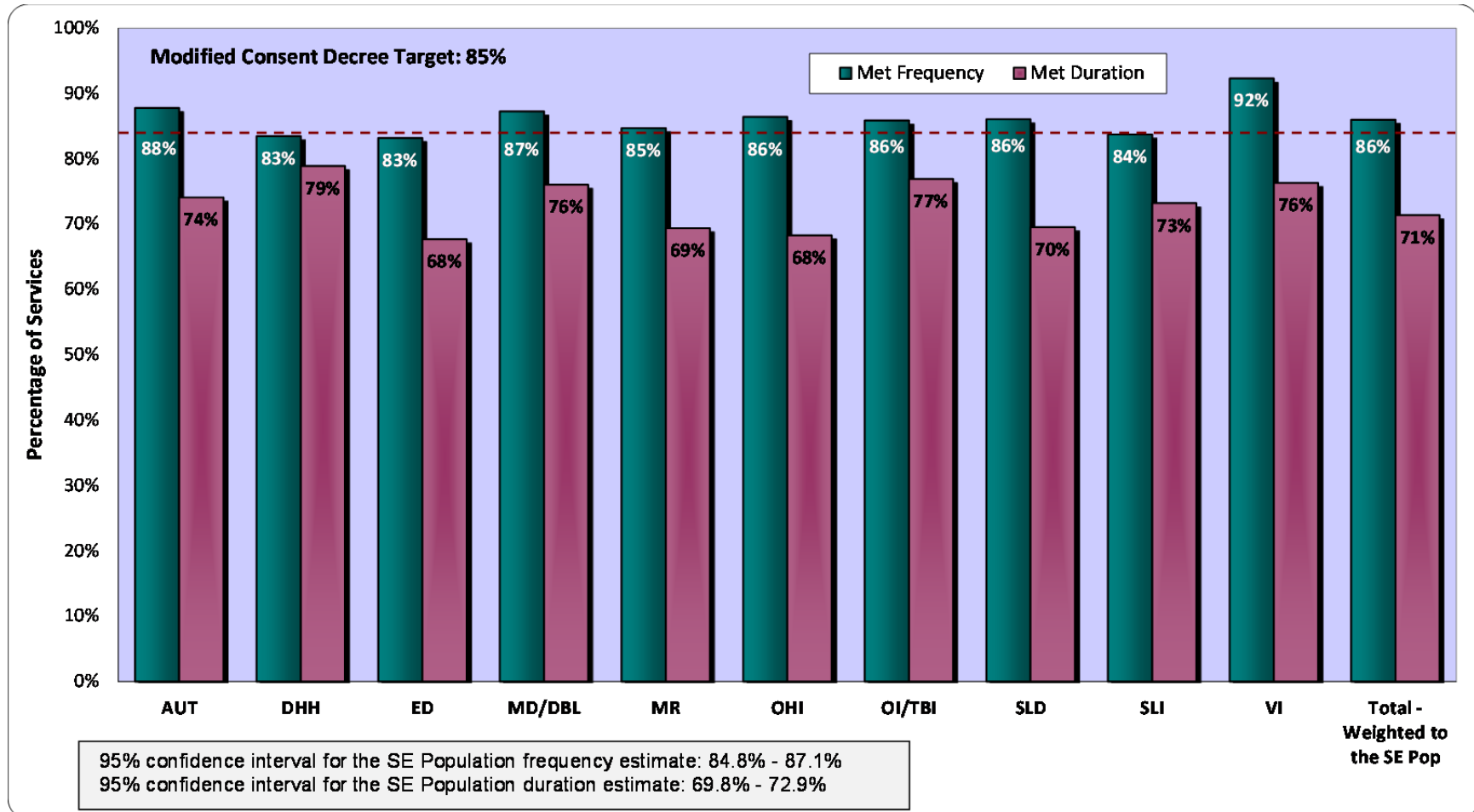
¹⁰ Note that there was an increase in the percentage of services in the Year 10 sample that reported ranges (e.g., 1-5) for frequency in the IEPs. For example, 40% of non-RSP, non-APE services that were designated as weekly had frequencies of 1-5 or 1-10 in the IEPs, in comparison to 34% of the sample services in Year 9. In determining the required frequency for the study period, the coding rules used the lowest number in the ranges, which in these cases would be "1." The increase in the use of ranges may have also contributed to the increase in the frequency rate estimate, since once a week is a lower threshold to meet than twice or three times a week.

¹¹ The frequency and duration population estimates represent students whose IEPs required at least one special education service, according to the Special Education Student Information System (SIS) database, and includes students with SLD. OIM also requested separate service delivery analyses for charter schools, based on students in the sample. For charter schools, we found that 85% of services for which we received logs met the frequency requirements (with confidence intervals of 81.9% and 87.8%), while 69% met the IEP specifications for duration (with confidence intervals of 65.3% and 73.0%).

¹² NPA services generally have larger duration amounts specified in the IEPs in relation to other services. One-third of the sampled NPA services had specified duration amounts of 1,800 minutes per week.

FIGURE 3

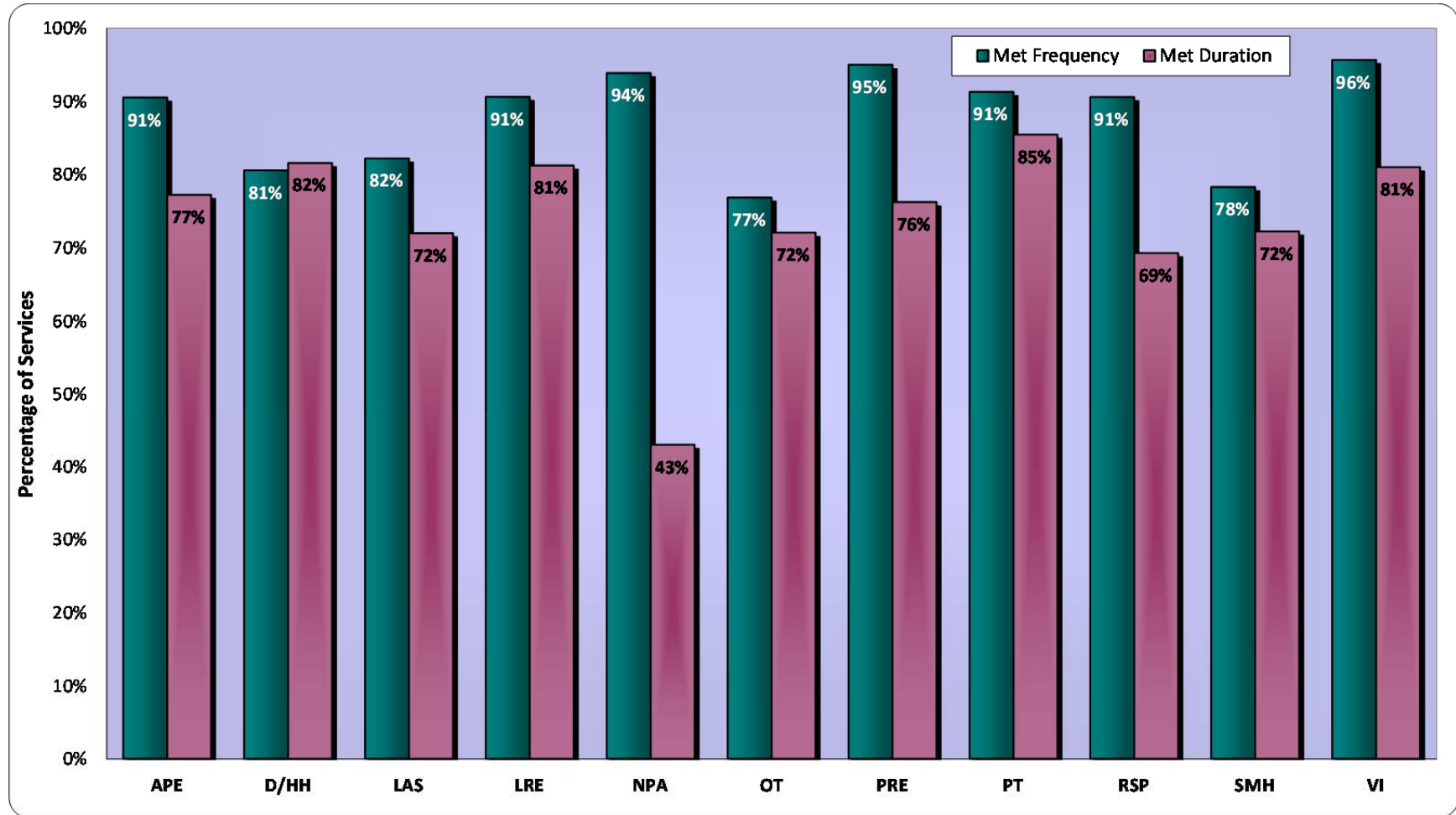
Percentage of services that met frequency/duration as specified by the IEPs during an 8-week/2-month period, by disability category, 2012-13



Note: The population estimate represents the population of students in special education district-wide whose IEPs required at least one special education service, according to the Special Education Student Information System (SIS) database, and includes students with Specific Learning Disability. Please see Appendix B for the number of service observations included in the frequency and duration analyses. Abbreviations: AUT (Autism); DHH (Deaf/Hard of Hearing); ED (Emotional Disturbance); MD/DBL (Multiple Disabilities/Deaf-Blindness); MR (Mental Retardation); OHI (Other Health Impairment); OI/TBI (Orthopedic Impairment/Traumatic Brain Injury); SE (Special Education); SLD (Specific Learning Disability); SLI (Speech/Language Impairment); VI (Visual Impairment).

FIGURE 4

Percentage of services that met frequency/duration as specified by the IEPs during an 8-week/2-month period, by service category, 2012-13



Note: These percentages include all disability categories receiving those particular services, including students with Specific Learning Disability. Please see Appendix B for the number of service observations included in the frequency and duration analyses. Abbreviations: APE (Adapted Physical Education); D/HH (Deaf/Hard of Hearing Itinerant Service); LAS (Language & Speech); LRE (Least Restrictive Environment Itinerant Service); NPA (Non-Public Agency); OT (Occupational Therapy); PRE (Pre-School); PT (Physical Therapy); RSP (Resource Specialist); SMH (School Mental Health); VI (Visual Impairment Itinerant Service).

Section II: Exploratory Analyses of Records that Missed Frequency and Duration

There has been a pattern of LAUSD not meeting the frequency outcome set by the MCD in previous years, and in all ten years of the study, LAUSD has not met the duration outcome. Based on these results, the OIM expressed a particular interest in understanding the extent to which services were missing IEP frequency and duration requirements to help inform and improve future service delivery efforts. Among the 5,118 service records that had evidence of at least one incident of service and for which AIR analyzed for frequency in Year 10, 4,409 met the frequency requirements while 709 did not. Table 1 shows the percentage of services that missed the required frequency by one session, which varied from 0% for NPA and 19% for RSP to 92% for Least Restrictive Environment and 93% for Visual Impairment services. In other words, all of the NPA services and 81% of the RSP services that missed frequency missed the requirement by more than one session. The high rate for RSP may be due to such services often being required daily, making it difficult to provide make-up sessions. Overall, nearly half (334 of 709) missed the required frequency by *more than one session*.

For the duration analysis, 3,735 service records met the IEP requirements, whereas 1,378 did not. As shown in Table 1, the percentage of services that missed the duration by one session ranged from 16% for RSP to 84% for Pre-School services.¹³ Among services that did not meet duration, 58% (796 of 1,378) missed the required duration by *more than one session*.

To understand the impact of missing the required frequency and duration by one session, AIR re-estimated the population estimates assuming that an additional session had been provided. If providers had provided an additional service session for services that missed the required frequency or duration, the population estimate would have improved from 86% to 93% for frequency and from 71% to 83% for duration.

¹³ For each service observation, AIR estimated the average session duration across the 8-week/2-month period to determine if a service missed the IEP duration requirement by a single session.

Table 1. Number and percentage of services that missed frequency and duration by one session, by service category, 2012-13

Service category	Total N that missed frequency	N that missed frequency by one session	% of services that missed frequency by one session	Total N that missed duration	N that missed duration by one session*	% of services that missed duration by one session
Adapted Physical Education	60	33	55%	144	53	37%
Deaf/Hard of Hearing	59	41	69%	56	37	66%
Language and Speech	232	123	53%	365	186	51%
Least Restrictive Environment	12	11	92%	24	16	67%
Non-Public Agency	7	0	0%	65	13	20%
Occupational Therapy	87	57	66%	105	67	64%
Pre-School	4	3	75%	19	16	84%
Physical Therapy	9	7	78%	15	10	67%
Resource Specialist Program	120	23	19%	391	63	16%
School Mental Health	105	64	61%	133	79	59%
Visual Impairment	14	13	93%	61	42	69%
Total	709	375	53%	1,378	582	42%
N and % of services that missed by more than one session		334	47%		796	58%

* To determine the duration amount of the missing sessions, the analysis used the most frequent duration listed on the log.

Table 2 provides more detail on the degree by which services missed the required frequency. For this examination, AIR focused on the two most common frequencies across an 8-week/2-month study period: 8 times (n = 422 records) and 16 times (n = 85). Please note that the percentages in Table 2 are based on the number of services that did not meet the IEP requirements for frequency. More than half (57%) of the services required once weekly (i.e., 8 times across 8 weeks) and 19% of services required twice a week (i.e., 16 times across 8 weeks) missed the required frequency by one. However, 17% of services required 8 times across 8 weeks and 26% of services required 16 times across 8 weeks were provided at *half or less* of the required frequency.

Table 2. Distribution of frequency provided for services that missed required frequency of 8 and 16 times across 8-week/2-month period, 2012-13

Services that required 8 sessions across 8-week/2-month period and did not meet frequency			Services that required 16 sessions across 8-week/2-month period and did not meet frequency		
N of sessions provided	N of services	% of services	N of sessions provided	N of services	% of services
1	6	1.4%	-	-	-
2	14	3.3%	2	2	2.4%
3	22	5.2%	3	2	2.4%
4	28	6.6%	4	5	5.9%
5	35	8.3%	5	3	3.5%
6	78	18.5%	6	3	3.5%
7	239	56.6%	7	2	2.4%
			8	5	5.9%
			9	7	8.2%
			10	3	3.5%
			11	5	5.9%
			12	8	9.4%
			13	10	11.8%
			14	14	16.5%
			15	16	18.8%
Total	422	100%	Total	85	100%

Similar patterns were found with the services missing the required duration. Table 3 presents the results for the two most commonly required duration amounts across an 8-week/2-month period among the 1,378 service records that did not meet duration: 240 minutes (n = 424 records) and 480 (n = 213 records). The percentages in Table 3 reflect the percentages of services that did not meet the required duration. Of those that missed duration, 14% of services requiring 240 minutes and a third (34%) of services requiring 480 minutes across eight weeks were under the required amount by two or more hours. However, more than half (54%) of services that missed the required duration of 240 minutes were provided within 30 minutes of the requirement.

Table 3. Distribution of duration provided for services that missed required duration of 240 and 480 minutes across 8-week/2-month period, 2012-13

For services requiring 240 minutes across 8-week/2-month period			
Minutes provided:	Under by:	N of services	% of services
211 - 239	29 minutes or less	24	5.7%
210	30 minutes	203	47.9%
181 - 209	31 - 59 minutes	13	3.1%
180	60 minutes	88	20.8%
151 - 179	61 - 89 minutes	4	0.9%
150	90 minutes	31	7.3%
121 - 149	91 - 119 minutes	1	0.2%
120	120 minutes	28	6.6%
Less than 120	121 minutes or more	32	7.5%
Total		424	100.0%
For services requiring 480 minutes across 8-week/2-month period			
Minutes provided:	Under by:	N of services	% of services
451 - 479	29 minutes or less	8	3.8%
450	30 minutes	56	26.3%
421 - 449	31 - 59 minutes	7	3.3%
420	60 minutes	47	22.1%
419 - 391	61 - 89 minutes	3	1.4%
390	90 minutes	17	8.0%
361 - 389	91 - 119 minutes	3	1.4%
360	120 minutes	15	7.0%
Less than 360	121 minutes or more	57	26.8%
Total		213	100.0%

To understand possible reasons why services were not being provided in accordance with the IEP, AIR also examined the cancelled sessions documented on the log for services that missed the required duration by one session.¹⁴ The analysis focuses services that missed the required duration by one session because they represent a sizeable number of services that LAUSD might more easily target for improvement. The electronic log system had a pull-down menu from which providers select reasons (defined by LAUSD) for cancelled sessions. For the purpose of this study, some cancellations were treated as a valid service session and the providers were not penalized for having cancelled the session for reasons beyond their control.¹⁵ However, a subset of the cancellations did not count as having provided a service session. These cancellations include provider absent (no reason provided),

¹⁴ For each service observation, AIR estimated the average session duration across the 8-week/2-month period to determine if a service missed the IEP requirement by a single session.

¹⁵ Examples include school events, student absence, and student no-show. Some provider absences counted towards frequency and duration if certain reasons were documented (i.e., jury duty, illness, personal necessity) and if they did not exceed two consecutive weeks. If no reason was provided for provider absence, the cancellation did not count as having provided a service.

provider unexcused from IEP meeting, IEP meeting for student who was to receive the cancelled service, IEP meeting for other student, provider off-calendar, waiver, early dismissal, cancelled (no additional information provided), and for certain services, student schedule change.¹⁶

Table 4 reports these results for all services that missed the duration by one session (n = 582).¹⁷ The most cited reason for a cancelled session was the provider attending an IEP meeting (19%), with an unexcused IEP meeting being the most common subset of that category (see shaded columns in Table 4). The rate was higher for Speech and Language services, with 18% of the logs for these services having at least one cancelled session due to an unexcused IEP meeting. A provider absence (no additional information) was the second most documented reason among services that missed duration by one session (12%). The results show that 62% of the services that missed duration by one session did not specify any of the reasons listed above (see “None of the prior reasons reported” column in Table 4).

¹⁶ The “unexcused IEP meeting” code is used when the IEP team will not excuse a provider from an IEP meeting. The provider is required to attend the entire meeting beyond the time discussing their particular service. The other IEP codes (IEP for the student whose service was cancelled on the log and IEP for other student) indicate that the provider is allowed to leave after giving their report.

¹⁷ “Waiver” was not reported on the logs that did not meet the duration requirements and therefore is not included in Table 4.

Table 4. Number and percentages of services by reason for cancelled sessions among services that did not meet required duration by one session, by service category, 2012-13

Service category	Duration not met	Student schedule change		IEP meeting (all reasons)		Unexcused IEP meeting <1>		IEP meeting for student receiving service<1>		IEP meeting, other student <1>	
Adapted Physical Education	53	0	0.0%	8	15.1%	3	5.7%	0	0.0%	5	9.4%
Deaf/Hard of Hearing	37	2	5.4%	6	16.2%	3	8.1%	1	2.7%	2	5.4%
Language and Speech	186	17	9.1%	55	29.6%	34	18.3%	4	2.2%	19	10.2%
Least Restrictive Env.	16	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Non-Public Agency	13	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Occupational Therapy	67	5	7.5%	20	29.9%	10	14.9%	4	6.0%	7	10.4%
Physical Therapy	10	0	0.0%	1	10.0%	1	10.0%	0	0.0%	0	0.0%
Pre-School	16	0	0.0%	2	12.5%	0	0.0%	1	6.3%	1	6.3%
Resource Specialist Prg.	63	4	6.3%	4	6.3%	1	1.6%	1	1.6%	2	3.2%
School Mental Health	79	5	6.3%	13	16.5%	4	5.1%	4	5.1%	6	7.6%
Visual Impairment	42	7	16.7%	4	9.5%	1	2.4%	1	2.4%	2	4.8%
Total	582	40	6.9%	113	19.4%	57	9.8%	16	2.7%	44	7.6%

Table 4 (cont.). Number and percentages of services by reason for cancelled sessions among services that did not meet required duration by one session, by service category, 2012-13

Service category	Duration not met	Provider absence (no reason specified)		Off calendar		Early out		Cancelled (no reason specified)		None of the prior reasons reported	
Adapted Physical Education	53	1	1.9%	0	0.0%	0	0.0%	0	0.0%	44	83.0%
Deaf/Hard of Hearing	37	1	2.7%	0	0.0%	0	0.0%	0	0.0%	29	78.4%
Language and Speech	186	35	18.8%	0	0.0%	3	1.6%	1	0.5%	84	45.2%
Least Restrictive Env.	16	1	6.3%	0	0.0%	0	0.0%	0	0.0%	15	93.8%
Non-Public Agency	13	0	0.0%	0	0.0%	1	7.7%	0	0.0%	12	92.3%
Occupational Therapy	67	8	11.9%	0	0.0%	2	3.0%	0	0.0%	33	49.3%
Physical Therapy	10	3	30.0%	0	0.0%	0	0.0%	0	0.0%	6	60.0%
Pre-School	16	2	12.5%	0	0.0%	0	0.0%	0	0.0%	12	75.0%
Resource Specialist Prg.	63	5	7.9%	0	0.0%	0	0.0%	0	0.0%	51	81.0%
School Mental Health	79	12	15.2%	2	2.5%	0	0.0%	0	0.0%	48	60.8%
Visual Impairment	42	4	9.5%	0	0.0%	1	2.4%	0	0.0%	26	61.9%
Total	582	72	12.4%	2	0.3%	7	1.2%	1	0.2%	360	61.9%

<1> The “Unexcused IEP meeting,” “IEP meeting for student receiving service,” and “IEP meeting, other student” are subsets of “IEP meeting” category.

<2> Because a single log could document several cancelled sessions, the categories above are not mutually exclusive. The total across all categories does not add to 100%.

Summary

In Year 10, the results show that LAUSD met the incident of service outcome of 93%, with the provision of 98% of the services specified in the IEPs, and the frequency outcome of 85%, with 86% of services (with a log) being provided at the required frequency. However, duration continues to be a concern, with 71% of services with a log being provided at the required duration, in comparison to the target of 85%. While additional analyses show many records are missing frequency and duration by the equivalent of one service session, they also showed that 60% of the services fell short of the IEP duration requirements by a larger margin.

Appendix A: Population Estimates and Statistical Confidence Intervals

Calculating Population Estimates

To derive estimates representative of the entire population of students in special education in the Los Angeles Unified School District (LAUSD), AIR assigned a weight to the evidence of service delivery, frequency, and duration estimates for each disability category.¹⁸ Table A-1 shows the population (Column A) and analytic sample size (Column B) of each disability category excluding Specific Learning Disability (SLD) for the evidence of service delivery analysis. The analytic sample is the number of students included in calculating the percentages for the evidence of service analysis ($n = 3,163$, excluding SLD) – students for whom we received a log and students for whom we expected a log but none was provided. Column C shows the probability that each student with a particular disability had of being sampled. To calculate this probability, we divided the analytic sample size by the population size for each disability category. In the case of students with Mental Retardation, for instance, each student had a 5% probability (Column C (i.e., $332 / 6,099$)) of being included in the analytic sample.

Column D presents the *probability weight*, which we calculated by dividing one by the probability of being included in the analytic sample. This weight reflects the number of students with the same disability category in the overall population represented by each student in the analytic sample. For example, each student with Mental Retardation in the analytic sample represented 18 students with this disability in the population. We then applied the weights to the individual percentages by disability category to derive an overall population estimate of 95%. Because SLD was examined separately for evidence of service delivery, we did not include it in generating the weighted population estimate for that analysis. We conducted similar weighting exercises to estimate population estimates for frequency and duration, which included all disability categories.

¹⁸ The population in this study is comprised of students in special education whose IEPs required at least one special education service and excluded students who did not have a disability code and students who attended non-public schools, who graduated or left LAUSD, or who were not three years old by September 30, 2012.

TABLE A-1

Probability and weights for evidence of service delivery population estimates (excluding SLD)

Disability category	Population ¹	Analytic Sample	Probability	Weight
	A	B	C	D
Autism	8,602	345	0.0401	24.9
Deaf/Hard of Hearing	1,281	320	0.2498	4.0
Emotional Disturbance	587	306	0.5213	1.9
Multiple Disabilities/Deaf-Blindness	1,057	275	0.2602	3.8
Mental Retardation	6,099	332	0.0544	18.4
Other Health Impairment	6,425	344	0.0535	18.7
Orthopedic Impairment/ Traumatic Brain Injury	811	334	0.4118	2.4
Speech & Language Impairment	7,730	586	0.0758	13.2
Visual Impairment	366	321	0.8770	1.1
Total	32,958	3,163		

¹ The population in this study consists of students who appeared in the Special Education Student Information System (SIS) database as having a disability category and as receiving at least one special education service. Students with SLD are excluded from the weights for the evidence of service delivery analysis since they are examined separately.

Statistical Confidence Intervals

The estimated rates of service delivery, frequency, and duration discussed in this report are point estimates of the population rates. These are the best single estimates for summarizing the information contained in the sample. It is also possible to generate intervals around these point estimates. These intervals reflect the probability of containing the true population measure (e.g., the service delivery rate for the full population of students with disabilities in LAUSD). Intervals at the 95% confidence level mean that there is a 95% probability that the true population measure falls between the lower and upper interval.

In order to generate confidence intervals, it is necessary to know the statistical distribution of the variable under analysis. In the case of this study, the unit of analysis is a dichotomous variable. This means that the variable analyzed only takes two possible values (e.g., yes or no), indicating whether a given service was provided or not. The distribution of such dichotomous variables is called a *Bernoulli distribution*. At a level of 95%, the confidence intervals for these distributions are defined as:

$$\left[p - 1.96 \frac{\sqrt{p(1-p)}}{\sqrt{n}}, p + 1.96 \frac{\sqrt{p(1-p)}}{\sqrt{n}} \right]$$

(*p* represents the proportion of cases estimated). This means, that if 100 samples are drawn from the population of students with disabilities in LAUSD, in 95 of the cases, the true population rate will be contained in these confidence intervals. Note that these intervals use the Central Limit Theorem (CLT). CLT holds that the sampling distribution of the mean will approximate a normal distribution in large samples. This allows us to construct confidence intervals without knowing the specific distribution of the variable under analysis in LAUSD, such as the

probability of receiving services. As with any inference testing, as the sample size increases, the accuracy of the estimates improve and confidence intervals get smaller. Conversely, the smaller the sample size, the larger the confidence intervals must be to maintain the 95% confidence level. Table A-2 presents the confidence intervals for individual disability categories and the overall population estimates.

TABLE A-2

Statistical confidence intervals by disability category, 95% confidence level, 2012-13

Disability category	% of Services with Evidence of Log			% of Services that Met Frequency			% of Services that Met Duration		
	Lower Limit	Upper Limit		Lower Limit	Upper Limit		Lower Limit	Upper Limit	
Autism	98.8%	97.6%	99.9%	87.8%	84.0%	91.6%	74.1%	69.0%	79.2%
Deaf/Hard of Hearing	98.0%	96.4%	99.5%	83.5%	78.9%	88.0%	78.9%	73.9%	83.9%
Emotional Disturbance	97.4%	95.6%	99.2%	83.2%	78.7%	87.7%	67.7%	62.0%	73.3%
Multiple Disabilities/ Deaf-Blindness	98.0%	96.3%	99.6%	87.3%	83.0%	91.6%	76.0%	70.5%	81.5%
Mental Retardation	98.1%	96.7%	99.6%	84.7%	80.5%	88.9%	69.4%	64.0%	74.8%
Other Health Impairment	97.6%	96.0%	99.2%	86.4%	82.4%	90.5%	68.3%	62.8%	73.8%
Orthopedic Impairment/Traumatic Brain Injury	98.1%	96.6%	99.6%	85.9%	81.8%	89.9%	76.9%	72.0%	81.8%
Specific Learning Disability	97.7%	96.7%	98.7%	86.0%	83.5%	88.6%	69.5%	66.2%	72.9%
Speech/Language Impairment	97.8%	96.6%	99.0%	83.7%	80.4%	87.0%	73.2%	69.2%	77.2%
Visual Impairment	99.3%	98.4%	100.2%	92.3%	89.2%	95.5%	76.3%	71.3%	81.3%
Population Estimates (including SLD)	--	--	--	86.0%	84.8%	87.1%	71.4%	69.8%	72.9%
Population Estimates (excluding SLD)	98.1%	97.7%	98.6%	--	--	--	--	--	--

Appendix B: Estimates for Years 2-10¹⁹

TABLE B-1

Percentages of services for which there was evidence of service provision by disability category, 2004-05 to 2012-13

	2004-05		2005-06		2006-07		2007-08		2008-09		2009-10		2010-11		2011-12		2012-13	
	Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10	
Disability	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services
	AUT	95%	528	87%	594	89%	704	91%	727	95%	771	95%	817	96%	679	95%	632	99%
DHH	95%	546	93%	524	90%	633	97%	622	96%	621	97%	664	97%	615	96%	589	98%	541
ED	81%	306	85%	355	80%	437	90%	400	94%	454	89%	495	83%	425	85%	422	97%	427
MD/DB	98%	432	93%	446	95%	656	95%	690	98%	707	97%	791	95%	462	95%	486	98%	542
MR	96%	385	88%	457	87%	577	92%	564	95%	597	96%	615	97%	527	95%	508	98%	483
OHI	84%	416	84%	424	81%	483	95%	539	93%	511	93%	525	90%	478	94%	493	98%	505
OI/TBI	93%	693	91%	740	89%	841	96%	893	97%	961	95%	981	95%	732	95%	749	98%	737
SLI	95%	338	78%	389	86%	459	91%	432	90%	928	95%	882	94%	807	91%	772	98%	715
VI	98%	630	96%	659	96%	751	98%	743	97%	756	99%	663	98%	593	94%	618	99%	561
Overall Population Estimate (w/o SLD)	93%		85%		87%		92%		94%		95%		95%		94%		98%	
SLD	73%	723	79%	744	74%	1,187	93%	1,251	91%	1,222	93%	1,271	91%	1,152	94%	1,140	98%	1,126

Note: In Years 8 - 10, yearly services were removed from the estimates. In the prior years, yearly services were kept in the analyses only if they met the log requirements.

¹⁹ Due to considerable changes in the study methodology since Year 1, the results for the first year (2003-04) are not presented.

TABLE B-2

Percentages of services with frequency at least equal to the IEP by disability category, 2004-05 to 2012-13

	2004-05		2005-06		2006-07		2007-08		2008-09		2009-10		2010-11		2011-12		2012-13	
	Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10	
Disability	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services
	AUT	56%	458	59%	462	66%	581	75%	633	70%	676	74%	753	81%	652	82%	602	88%
DHH	58%	486	66%	423	75%	528	77%	577	74%	562	73%	631	85%	592	82%	563	83%	417
ED	49%	206	67%	254	74%	320	69%	345	68%	373	66%	423	74%	348	73%	352	83%	369
MD/DB	60%	363	70%	374	80%	531	82%	551	74%	550	71%	630	87%	433	87%	460	87%	455
MR	54%	348	61%	365	74%	462	76%	487	74%	525	74%	572	81%	506	83%	482	85%	405
OHI	56%	305	58%	298	70%	351	78%	483	72%	442	75%	475	81%	428	82%	465	86%	391
OI/TBI	67%	543	70%	582	78%	612	80%	748	77%	785	74%	798	85%	687	85%	713	86%	615
SLD	52%	442	54%	459	65%	794	77%	1,105	73%	1,058	77%	1,168	83%	1,040	86%	1,076	86%	874
SLI	49%	289	50%	282	62%	360	71%	367	70%	776	72%	820	81%	751	84%	701	84%	571
VI	60%	571	68%	583	82%	690	85%	686	84%	693	82%	637	86%	570	93%	583	92%	481
Total (unweighted)	57%	4,011	63%	4,082	73%	5,229	78%	5,982	74%	6,440	74%	6,907	83%	6,007	84%	5,997	86%	5,118
Overall Population Estimate	--	--	--	--	--	--	76%		72%		74%		82%		83%		86%	

Note 1: 2007-08 is the first year in which a population estimate was calculated for frequency. This estimate in 2007-08 through 2009-10 is not comparable to earlier years.

Note 2: In Years 8 - 10, yearly services were removed from the estimates. In the prior years, yearly services were kept in the analyses only if they met the frequency requirements.

TABLE B-3

Percentages of services with duration at least equal to the IEP by disability category, 2004-05 to 2012-13

	2004-05		2005-06		2006-07		2007-08		2008-09		2009-10		2010-11		2011-12		2012-13	
	Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10	
Disability	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services
AUT	58%	458	59%	463	60%	573	69%	627	63%	675	61%	757	65%	651	69%	601	74%	540
DHH	60%	484	68%	419	76%	513	77%	579	75%	559	72%	630	80%	592	76%	563	79%	417
ED	65%	200	69%	255	77%	310	67%	343	70%	380	66%	425	65%	347	65%	351	68%	365
MD/DB	60%	359	74%	373	82%	548	82%	598	74%	618	68%	701	78%	431	76%	458	76%	455
MR	55%	345	64%	365	69%	463	73%	483	70%	516	65%	572	67%	506	68%	481	69%	405
OHI	59%	299	61%	302	65%	338	72%	485	67%	436	69%	473	69%	428	71%	464	68%	391
OI/TBI	68%	542	73%	582	78%	641	80%	806	75%	828	68%	878	76%	686	73%	711	77%	615
SLD	56%	435	59%	467	56%	762	72%	1,094	66%	1,032	69%	1,160	71%	1,037	70%	1,076	70%	873
SLI	51%	288	53%	282	62%	354	70%	366	64%	764	64%	819	66%	750	70%	701	73%	571
VI	63%	567	69%	581	81%	685	81%	689	80%	691	75%	641	77%	566	78%	583	76%	481
Total (unweighted)	60%	3,977	65%	4,089	70%	5,187	75%	6,070	70%	6,499	68%	7,056	71%	5,994	72%	5,989	73%	5,113
Overall Population Estimate	--	--	--	--	--	--	72%		67%		67%		69%		70%		71%	

Note 1: 2007-08 is the first year in which a population estimate was calculated for duration. This estimate in 2007-08 through 2009-10 is not comparable to earlier years.

Note 2: In Years 8 - 10, yearly services were removed from the estimates. In the prior years, yearly services were kept in the analyses only if they met the duration requirements.

TABLE B-4

Percentages of services for which there was evidence of service provision by service category, 2004-05 to 2012-13

	2004-05		2005-06		2006-07		2007-08		2008-09		2009-10		2010-11		2011-12		2012-13	
	Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10	
Disability	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services	% of Services for which there was Evidence of Service Provision	N of Services
APE	99%	977	96%	962	98%	1,038	99%	1,010	98%	944	97%	908	98%	736	97%	739	99%	752
DHH	100%	390	99%	392	96%	448	99%	453	99%	487	98%	484	100%	414	98%	407	98%	383
LAS	96%	1,075	86%	1,147	82%	1,420	86%	1,414	90%	1,759	97%	1,825	96%	1,655	95%	1,627	98%	1,590
LRE	85%	197	95%	198	96%	254	95%	276	100%	249	92%	232	97%	170	93%	180	99%	162
NPA	95%	55	85%	110	92%	155	87%	187	93%	295	90%	372	99%	142	75%	151	93%	169
OT	98%	402	93%	427	92%	537	94%	530	98%	521	97%	557	95%	461	91%	435	99%	433
PRE	100%	75	38%	110	95%	100	100%	102	100%	127	90%	112	100%	75	61%	98	100%	91
PT	100%	131	94%	148	98%	218	98%	247	99%	307	99%	339	94%	105	98%	110	98%	121
RSP	65%	959	77%	1,055	71%	1,592	95%	1,612	91%	1,733	91%	1,789	87%	1,764	94%	1,719	97%	1,631
SMH	88%	409	86%	459	87%	572	94%	641	96%	686	93%	714	88%	587	90%	574	99%	583
VI	99%	327	97%	324	100%	394	100%	389	100%	420	100%	372	100%	361	99%	369	100%	375

Note: In Years 8 - 10, yearly services were removed from the estimates. In the prior years, yearly services were kept in the analyses only if they met the log requirements.

TABLE B-5

Percentages of services with frequency at least equal to the IEP by service category, 2004-05 to 2012-13

	2004-05		2005-06		2006-07		2007-08		2008-09		2009-10		2010-11		2011-12		2012-13	
	Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10	
Disability	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services	% of Services with Frequency at least Equal to the IEP	N of Services
APE	68%	893	70%	865	81%	945	85%	973	81%	879	77%	866	87%	718	91%	718	91%	632
DHH	62%	362	69%	346	81%	397	77%	430	73%	446	73%	459	86%	408	84%	397	81%	304
LAS	42%	965	48%	895	60%	1,085	69%	1,140	65%	1,474	67%	1,753	79%	1,577	82%	1,549	82%	1,303
LRE	80%	145	87%	174	87%	212	91%	246	87%	243	86%	211	90%	162	86%	167	91%	128
NPA	80%	39	70%	77	71%	123	77%	150	71%	245	76%	308	91%	141	88%	114	94%	114
OT	55%	367	67%	365	72%	429	72%	426	66%	423	71%	457	75%	437	72%	395	77%	376
PRE	80%	51	81%	36	76%	87	90%	101	91%	122	89%	99	93%	74	95%	60	95%	80
PT	61%	72	79%	90	71%	114	80%	113	78%	125	71%	134	77%	99	84%	108	91%	103
RSP	60%	498	54%	593	67%	994	81%	1,461	79%	1,507	81%	1,611	85%	1,529	87%	1,615	91%	1,273
SMH	45%	318	65%	352	71%	459	64%	571	61%	574	60%	645	70%	509	69%	510	78%	484
VI	63%	301	71%	289	92%	384	87%	371	89%	402	87%	364	94%	353	96%	364	96%	321

Note: In Years 8 - 10, yearly services were removed from the estimates. In the prior years, yearly services were kept in the analyses only if they met the frequency requirements.

TABLE B-6

Percentages of services with duration at least equal to the IEP by service category, 2004-05 to 2012-13

	2004-05		2005-06		2006-07		2007-08		2008-09		2009-10		2010-11		2011-12		2012-13	
	Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10	
Disability	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services	% of Services with Duration at least Equal to the IEP	N of Services
APE	67%	881	73%	869	83%	945	86%	966	79%	868	70%	860	81%	716	73%	717	77%	632
DHH	64%	361	72%	342	84%	383	79%	431	76%	446	76%	458	86%	408	84%	397	82%	304
LAS	44%	959	50%	899	60%	1,064	67%	1,141	61%	1,459	59%	1,754	66%	1,575	72%	1,548	72%	1,303
LRE	80%	144	87%	176	81%	211	81%	248	85%	241	75%	208	81%	162	75%	167	81%	128
NPA	83%	42	68%	77	55%	119	60%	148	52%	243	54%	301	51%	140	56%	112	43%	114
OT	56%	365	66%	369	67%	435	68%	461	62%	452	65%	514	68%	436	67%	395	72%	376
PRE	86%	51	83%	36	69%	86	79%	97	80%	119	79%	99	89%	74	75%	60	76%	80
PT	60%	72	75%	81	80%	173	88%	202	85%	221	83%	253	73%	99	82%	108	85%	103
RSP	61%	487	60%	601	55%	946	75%	1,437	69%	1,457	72%	1,602	69%	1,526	67%	1,612	69%	1,273
SMH	62%	313	67%	355	74%	445	67%	570	68%	589	63%	642	65%	507	67%	509	72%	479
VI	67%	302	72%	284	89%	380	83%	369	85%	404	81%	365	80%	351	85%	364	81%	321

Note: In Years 8 - 10, yearly services were removed from the estimates. In the prior years, yearly services were kept in the analyses only if they met the duration requirements.



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