MATHEMATICA Policy Research

REPORT

casey family programs

EXECUTIVE SUMMARY

Superutilization of Child Welfare, Medicaid, and Other Services

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Mathematica Policy Research

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EXECUTIVE SUMMARY

In the United States, approximately 1.3 million children annually receive services from a child welfare agency following a report of child maltreatment. In 2016, 203,582 of these children entered into foster care (DHHS 2018). At the end of federal fiscal year 2016, 437,465 children were in foster care (DHHS 2017). In addition to receiving child welfare services, children placed in foster care are eligible for Medicaid. Although these children represent only 3 percent of all children receiving Medicaid, they account for 15 percent of those receiving Medicaid behavioral health services (Allen and Hendricks 2013). Therefore, to capture a fuller array of services that children in foster care receive, it is necessary to combine Medicaid and child welfare services data. By identifying and describing patterns of high service use across both Medicaid and child welfare systems, agencies can provide more tailored and effective services sooner to better meet the needs and improve outcomes for children in foster care.

Study purpose

To understand high service use ("superutilization") among children in foster care, and identify characteristics predictive of those children who experience superutilization of services, this study links administrative data from child welfare and Medicaid from (1) the state of Tennessee (referred to as the Tennessee sample) and (2) the three-county region of Hillsborough, Pasco, and Pinellas counties in Florida (referred to as the Florida sample). For Florida, administrative data on other substance abuse and mental health services were also linked. The samples include children, youth, and young adults ages birth to 24 years who entered an out-of-home care episode (custody episode) during the sample time frame, which was July 2011 through December 2015 for Tennessee, and September 2013 through December 2015 for Florida.

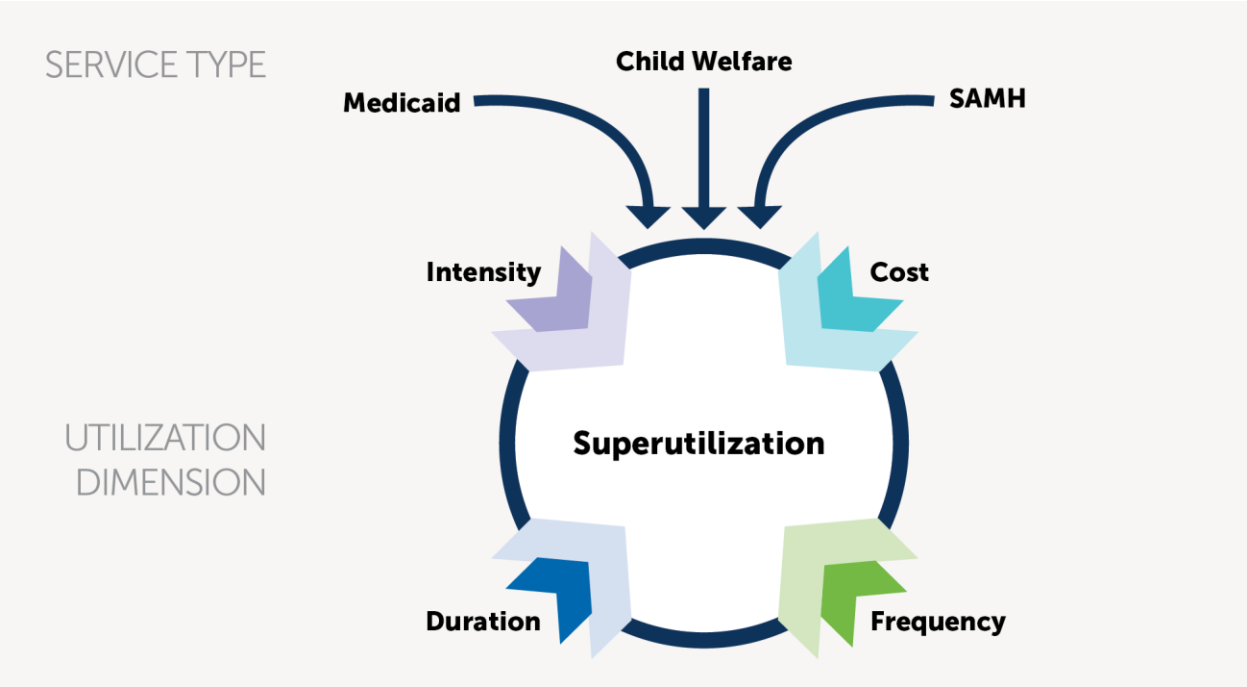
The study addresses the following research questions:

- What is superutilization of child welfare and other services? What are the distinguishing characteristics of children who experience superutilization of child welfare and other services?
- Are there different types of superutilization? Specifically, are there types of superutilization based on frequency, duration, intensity, or cost of services?
- What characteristics of children at the time of child welfare involvement—specifically at the time of entry into out-of-home care—predict superutilization?

Definition of superutilization

As illustrated in Figure ES.1, the multidimensional approach this study uses to define superutilization encompasses four key service components: frequency, duration, intensity, and cost. Our measurement of superutilization includes child welfare services, Medicaid services, and, for Florida, non-Medicaid substance abuse and mental health (SAMH) services. Superutilization was operationalized as service use for a child which meets or exceeds the 90th percentile of service utilization on any one measure (measures are adjusted for time in study and for age).

Figure ES.1. Data sources and dimensions of superutilization



Note: SAMH is Substance Abuse and Mental Health data in Florida.

Superutilization measures

Tables ES.2 and ES.3 present the measures used to operationalize superutilization for each of the Tennessee and Florida study sites, respectively. The superutilization measures and threshold values are specific to each study site. Although we use the 90th percentile to determine the threshold for superutilization on each measure, in some cases, this may identify more or less than 10 percent of children due to the skewed nature of the distribution. Also, we find little overlap among children identified by different types of superutilization. For example, among the children who experience at least one form of superutilization, about half of these children in TN and FL achieve superutilization in more than one category.

Characteristics of children who experience superutilization

Due to the limited overlap among children identified by each of our measures of superutilization, about 57 percent (12,332 children) in the Tennessee sample and 56 percent (3,726 children) in the Florida sample are identified as experiencing superutilization of services.

Tennessee

For the Tennessee sample, a higher percentage of adolescents are identified as experiencing superutilization, compared to those who did not. A higher percentage of children with superutilization compared to those without superutilization have a child's behavior problem identified as a reason for removal. However, for those with parental drug abuse as a reason for removal, we find a lower percentage of children with superutilization than those without (42.4 percent). Children experiencing superutilization of services have the highest percentage (12.7 percent) identified from the Special Investigations Unit; these are children currently in foster

care being investigated for child maltreatment. The percentage is much less (6 percent) among those who did not experience superutilization.

Though the data are limited in availability and in terms of only total scores, we find higher percentages of children with greater need based on CANS scores among those experiencing superutilization than among those who did not. Also, we find a lower average score on the Ansell-Casey Life Skills assessment among those with superutilization compared to those without superutilization, indicating those with superutilization on average have less-developed life skills. A lower percentage of children experiencing superutilization exited custody within the study window, compared to other children. Among those who did exit custody, there are also differences between those who experienced superutilization and those who did not in regard to their exit types. Specifically, greater percentages of those with superutilization emancipated from out-of-home care, whereas lower percentages exited custody to guardianship or relative/kinship placements, compared to those who did not experience superutilization.

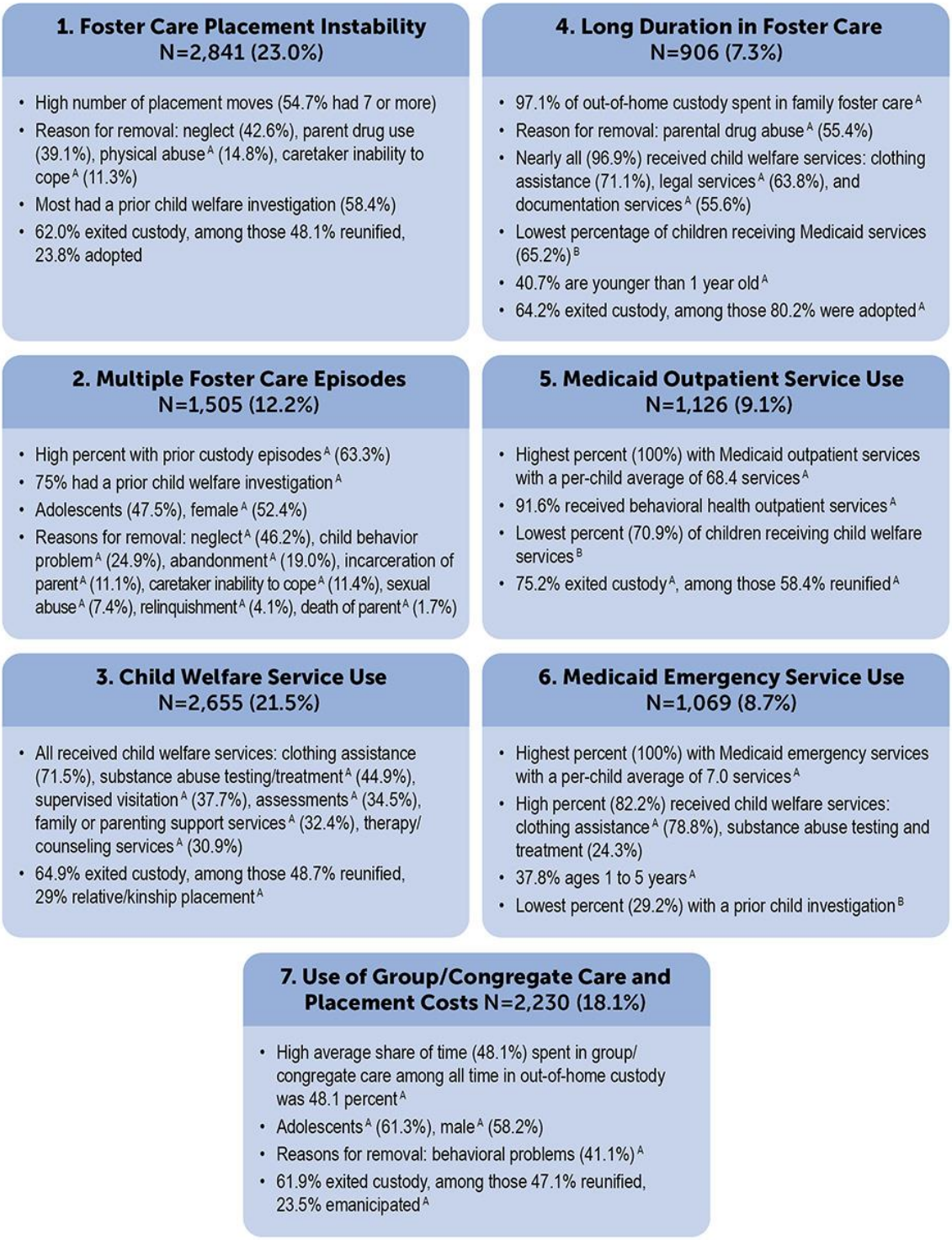
Florida

For the Florida sample, we find higher percentages of males and adolescents but lower percentages of children ages 1 to 6 years old among those experiencing superutilization compared to those who did not. Unlike in the Tennessee sample, children who experienced superutilization and those who did not have similar percentages of exiting child welfare custody within the study window. However, among those who did exit, a higher percentage of children experiencing superutilization exited to adoption and a lower percentage exited to reunification.

Types of superutilization

To examine different types of superutilization, we used latent class analysis to identify distinct groups of superutilization among children who entered out-of-home care. Figures ES.2 and ES.3 present the different groups (“classes”) of children experiencing superutilization for the Tennessee and Florida samples, the proportion of the population in each group, and their distinguishing characteristics. Footnotes indicate noteworthy characteristics, with it being the highest or lowest proportion of this characteristic across all latent classes. Additional information about services and findings can be found in the full report.

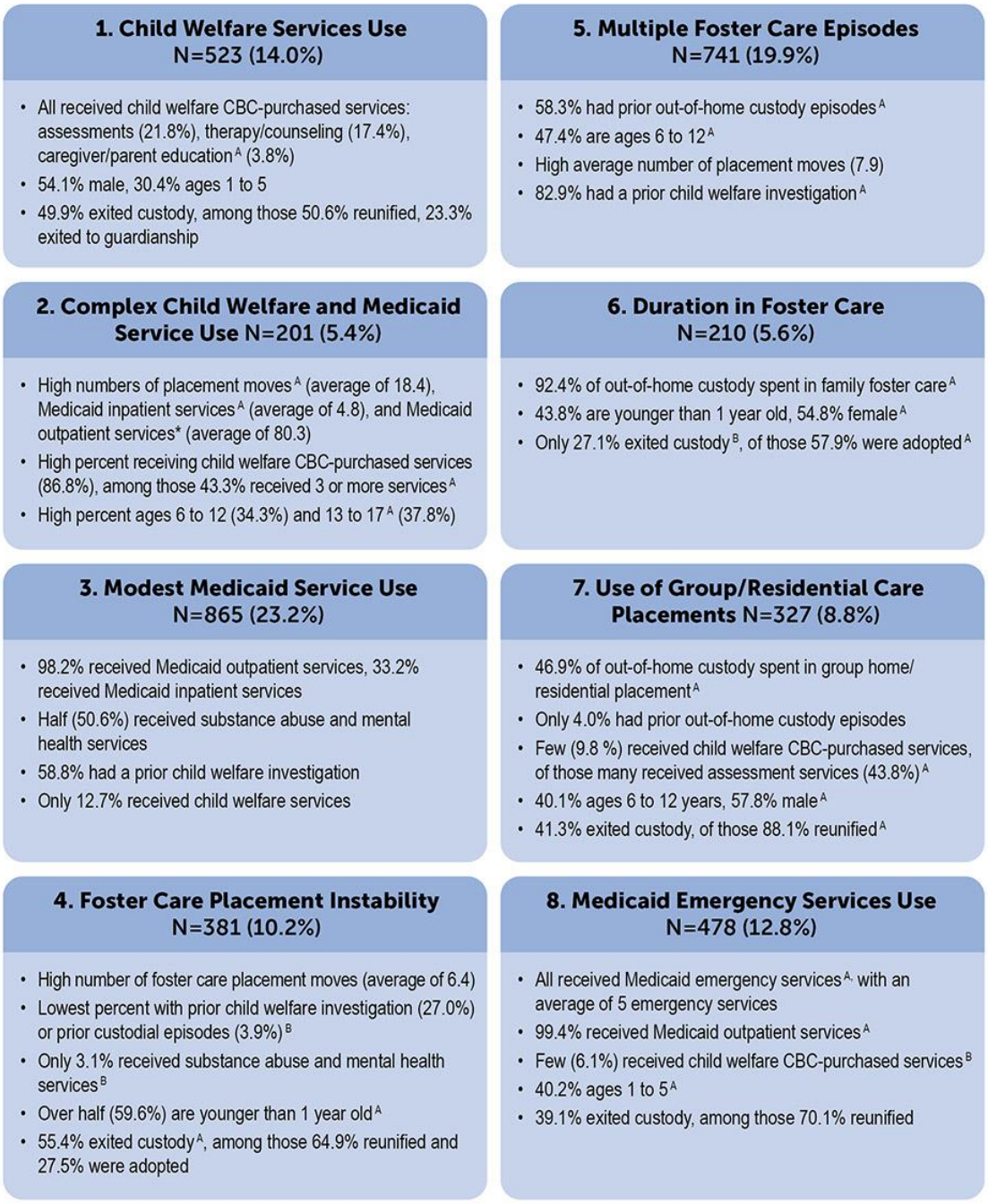
Figure ES.2. Percent of Tennessee sample among types of superutilization and their distinguishing characteristics



[A] Indicates highest proportion of this characteristic across all latent classes.

[B] Indicates lowest proportion of this characteristic across all latent classes.

Figure ES.3. Percent of Florida sample among types of superutilization and their distinguishing characteristics



Note: CBC means Community-Based Care agency, which is a human services organizations that Florida OCW contracts with to provide child and family social services.

[A] Indicates highest proportion of this characteristic across all latent classes.

[B] Indicates lowest proportion of this characteristic across all latent classes.

Implications

Interpretation of the results and discussion of the implications are informed by input from our site partners. Most importantly, given that we have identified meaningful differentiation of superutilization among seven classes for Tennessee and eight classes for Florida, the results emphasize the complex multidimensionality of superutilization. From a practice and policy perspective, this may require nuanced interventions for particular types of superutilization rather than a universal approach.

Below, we summarize several key findings, implications, and questions that arose from discussions with site partners:

- Each site has a superutilization group of children with many placement moves. Questions raised regarding this group include the following: What is causing the frequent placement moves? What actions could be taken to help address those factors, such as a change in the composition, sequencing, or intensity of caseworker, behavioral health, or other services? Are the children not receiving the appropriate type of services necessary for them to heal from trauma? What underlying conditions need to be addressed better?
- In Tennessee, there is a child welfare service class in which children received many child welfare services but also exited to reunification and kinship care at high rates among those who exited. In fact, the rate of those exiting to kinship care is the highest among all classes. Does this mean that child welfare services are working and effective for these families? If more child welfare services were delivered to children in other classes, is it possible they would see greater rates of exits to reunification or kinship?
- A small but notable group of children with a high number of emergency room visits is worth further investigation for each state. Questions that arose among site partners include the following: While most of these visits relate to physical health needs, some are due to the need for emergency treatment for a behavioral health condition, but which condition and what could have been done to prevent it? Are these children experiencing a higher rate of serious physical injuries? Are a substantial portion of these visits for older children due to suicide ideation or a suicide attempt? Are a substantial portion of these visits due to chronic health conditions? Do these children have a medical home that is being underutilized?
- In both sites, there is a small but important group of "long-stayers" in foster care. The adoption rates are promising for this class in terms of achievement of permanency, but are there ways to speed up the adoption process so that children are not experiencing long durations in care, and the overall time to adoption can be decreased?
- In both Tennessee and Florida, extensive use of group home and residential treatment is a type of superutilization. The use of these forms of congregate care for children placed out of home has decreased in the United States by about 37 percent (U.S. Children's Bureau 2016). Many states are focusing on ensuring that only children who truly need that service are placed in group care by closely examining assessment and other sources of data to identify distinctive groups of youth and what alternatives could be used for each.
- In Florida, one superutilization group is characterized by extensive use of both child welfare and Medicaid services. Further review of those cases might provide added information about what is working and not working for those youth; and if actions could have been taken early

in a child's interaction with these service delivery systems that would lessen the need for these services in the long run. For example, did the child "fail up" into more restrictive and comprehensive services when a more targeted and timely set of services may have prevented that services trajectory?

Moreover, we identify classes or types of superutilization that share similar distinguishing characteristics across both study sites, which may support a consistent type of superutilization found in numerous locations. For example, we identified common types of superutilization in terms of high use of emergency services, long durations in child welfare custody, foster care placement instability, and multiple foster care episodes. It would be good to explore strategies for how to recognize youth who are on these trajectories early and determine how that pathway direction could be altered early in the child's service interactions.

These results highlight the importance of considering service use in child welfare, along with Medicaid services use, and use of other services where available. Given we find several classes with combinations of service use among child welfare, health, and mental health and substance abuse services, policymakers and practitioners could benefit from understanding the complex service needs and receipt across service providers to ensure adequate coordination and effective service delivery.

Predictive factors of placement instability

After reviewing the findings on types of superutilization, both states were interested in focusing the predictive analysis on children who experience superutilization in regard to foster care placement moves. Partners from both study sites emphasized the importance of the issue of placement instability, noting the findings can help inform current efforts to reduce it.

Unlike the sample time frame for the descriptive and latent class analysis, the predictive analysis required an alternative restriction and structuring of the data, creating a different study sample. For both Tennessee and Florida, we used 12-month prediction and lookback periods, which are anchored by the start date of the first out-of-home custody episode during the study time period. To create the prediction and lookback periods, we selected samples for each site with a time interval that would allow for both 12-month lookback and prediction periods without being censored by the study window. For Tennessee, we used a sample eligibility time period from July 1, 2012, to December 31, 2014. For Florida, data for most site partners were available from January 2011 to December 2015, with the exception of CBC-purchased services data provided by Eckerd, which were only available for a shorter time period. With input from the Florida site partners, we used a sample eligibility time period from January 1, 2012, to December 31, 2014, for the predictive analysis sample, to maximize our ability to use 12-month lookback and prediction periods.

We identified predictor variables that would be available at time of entry into child welfare custody. Most predictor variables were measured over the 12-month lookback period prior to entry into custody. However a few child welfare variables were measured over the lifetime of the child prior to entry into the custody episode, specifically the number of prior child welfare investigations, the number of prior custody episodes, and the total length of stay in prior episodes. For Tennessee, we used a total of 65 predictor variables in the final model and for Florida we used 53 predictor variables. Table ES.1 provides a summary of the variable domains.

Table ES.1. Variable domains for Tennessee and Florida predictive models

	Tennessee	Florida
Variable domain	Description of predictive variables	Description of predictive variables
Child demographic characteristics	Age, race, and gender	Age, race, and gender
Prior investigations	Number of prior child welfare investigations	Number of prior child welfare investigations
Reason for removal	Reason for removal	N/A
Foster care placements	Number of placement moves and average percentage of time in group/congregate care	Number of placement moves and average percentage of time in group/residential care
Child welfare custodial episodes	Number of prior child welfare custodial episodes and total length of stay (in days) in prior custodial episodes	Number of prior child welfare episodes and total length of stay (in days) in prior out-of-home foster care placements
Child welfare services	Number of custodial and noncustodial child welfare services	N/A
Child welfare assessments	Average results from Child and Adolescent Strengths and Needs (CANS),Family Advocacy and Support Tool (FAST), Youth Level of Service (YLS), and Ansell-Casey Life Skills Assessments	N/A
Average recommended service level across prior investigations	Average recommended service level (no services needed, services recommended, services required) across prior investigations	Average recommended service level (no services needed, services recommended, services required) across prior investigations
Medicaid services	Number of inpatient, outpatient, and emergency behavioral and physical health services	Number of inpatient, outpatient, and emergency behavioral and physical health services
SAMH services	N/A	Number of substance abuse and mental health services
SAMH assessments	N/A	Average results of Children's Functional Assessment Rating Scale (CFARS) and American Society of Addiction Medicine (ASAM) assessments
Region composition	DCS region-level demographic information, including regional racial composition, percentage of married households, percent foreign born, percentage with a high school diploma or equivalent, percent unemployed, poverty status, and urbanicity	OCW region-level demographic information, including regional racial composition, percent foreign born, percentage with a high school diploma or equivalent, percent unemployed, poverty status, and urbanicity

We compared the predictive performance of three models: (1) logistic regression with elastic net regularization (EN), (2) K-nearest neighbors (KNN), and (3) random forests (RF). For purposes of final model selection, the statistical measure that best captures overall model classification accuracy is the Area Under the Receiver Operator Characteristic Curve (AUC). The AUC is a summary measure of overall model predictive performance, which in this case refers to how well the model correctly classifies children who experience superutilization

compared to children who do not. The RF modeling approach consistently achieved the highest AUC across both study sites; therefore, all results discussed below are based solely on the predictions from the RF models.

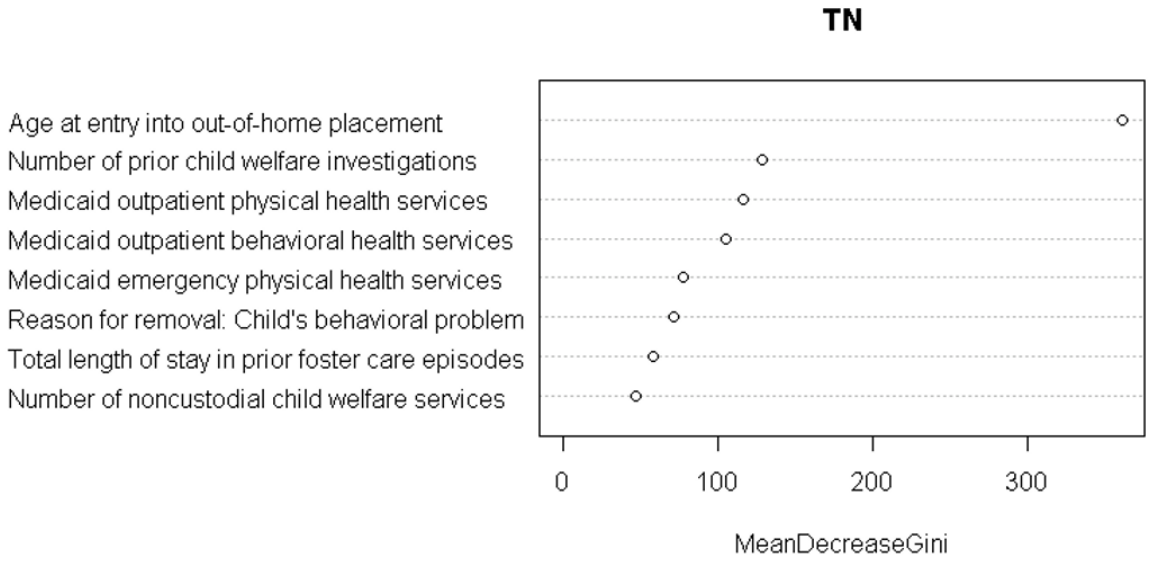
With a predictive model that performs well, we can answer the key research question about which characteristics predict superutilization as defined by the number of placement moves. In addition to model performance, it is also relevant to child welfare agencies to know which variables may be important to monitor in assessing a child's risk of experiencing superutilization. The results of the RF model indicate the relative importance of the variables by showing how each contributes to the overall model fit. For RF models, this can be determined by ranking individual predictors based on the mean percentage change in the Gini impurity index (James et al. 2013). This index measures the change in overall model fit that a given predictor contributes, with higher values indicating a greater contribution. The AUC and the Gini impurity index for each study site are summarized below; further interpretation of the predictive factors can be found in Chapter VIII.

Tennessee

For Tennessee, the AUC on the test sample was 0.727, which suggests that the model performs well when distinguishing a child who experienced placement instability superutilization from a child who did not.

Figure ES.4 lists the 10 most important predictors based on the mean change in the Gini index for Tennessee. Based on the rankings, a child's age at entry into the first out-of-home placement during the prediction period is the most important variable by a wide margin (the mean decrease in the Gini index is over 350), followed by the number of prior Child Protective Services (CPS) investigations. Several Medicaid services measures also rank high on the Gini index, specifically Medicaid outpatient physical and behavioral health services and emergency physical health services. Other important predictive factors are related to prior child welfare involvement, such as length of stay in prior out-of-home custody episodes and receipt of prior noncustodial services. Several reasons for child welfare removal were also important predictors, in particular child's behavior problems and neglect.

Figure ES.4. Eight most important predictors for placement instability superutilization in Tennessee

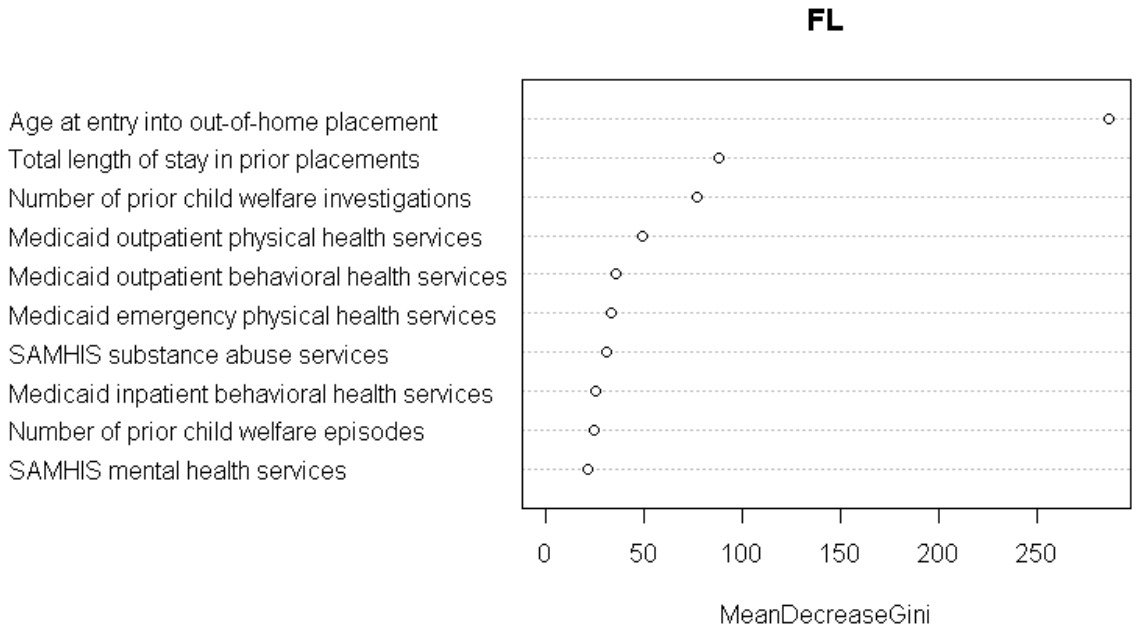


Source: Tennessee DCS; TennCare; American Community Survey 2015; U.S. Census 2010.

Florida

The AUC for Florida was 0.722, which is very close to the AUC for Tennessee. Figure ES.5 lists the 10 most important variables in the Florida model in terms of mean decrease in the Gini index. Similar to the results for Tennessee, a child's age at entry into out-of-home placement was the most important predictor by a wide margin. Multiple Medicaid services measures were also identified as important predictors based on the Gini index. In particular, Medicaid outpatient physical and behavioral health services, physical health emergency services, and inpatient behavioral health services were identified as important predictors. Several measures regarding prior child welfare involvement were also important predictors, specifically length of stay in prior out-of-home placements, prior child welfare investigations, and prior child welfare episodes. Also, SAMH services measures, in particular non-Medicaid funded mental health and substance abuse services, were identified as important predictors.

Figure ES.5. Ten most important predictors of placement instability superutilization in Florida



Source: Florida OCW; Florida AHCA data; Florida SAMH; American Community Survey 2015; U.S. Census 2010.

Implications

The results of this analysis are key to understanding the factors that lead to a high risk of placement instability—and to spotting them early enough to provide at-risk youth with the support and attention to prevent a high number of placement moves, which research has stated is detrimental to children's well-being. Several policy and practice implications can be identified, including the following:

- Many variables in the predictive model have an expected effect on the likelihood of placement changes, such as older children and length of time in prior placements. As children age, they are more likely to have placement changes, in part as a function of time. Similarly, we would expect the total length of stay in foster care to be associated with placement instability due to the issue of more time for more placement moves, though this does not necessarily have to be the case.
- For both sites, prior child welfare investigations predict placement instability. This finding may indicate that at the time of investigation, many families' needs are not being addressed adequately enough. The point of investigation is a window of opportunity to assess family need and provide associated supports to prevent further involvement in the child welfare system. If the initial agency response is not sufficient, these children are re-reported to CPS and eventually often taken into custody.
- The predictive analysis results from Tennessee show that when child behavior problems are listed as a reason for removal, the child becomes much more likely to experience placement

instability. This finding is consistent with the research and points to the importance of early intervention in behavioral health with the right intensity to address the child's needs and reduce placement disruption. It also points to the need to help foster parents adequately address and deal with children's behavioral problems.

- Medicaid services are also important predictive factors for placement moves. Medicaid emergency room visits for physical health problems was a predictor in both sites, but questions remain about the nature of the relationship. One possibility is that emergency room visits are the result of—not the cause of—placement changes, as has been found in one major study (Rubin et al., 2004).
- Medicaid outpatient services for physical and behavioral services are predictive factors for both sites. This finding may mean that children requiring more of these services have comorbid conditions (multiple behavioral health and physical health problems) or more severe behavioral health problems that foster parent providers are not equipped to deal with.
- For Florida, SAMH-funded substance abuse and mental health services are also important predictors of placement instability. SAMH services could be used if a child's need is judged to be not medically necessary or if a Medicaid provider is not available. This raises the question of whether service gaps in the Medicaid and child welfare delivery systems are causing delays in treatment and greater difficulties for some children—making them more likely to experience high degrees of placement instability.
- Evidence-based interventions to manage children's emotional and behavioral disorders could likely go a long way to support placement stability. With federal approval, Medicaid may be an avenue for reimbursing evidence-based practices, thereby offsetting some of their costs at the state level. This can be done through a State Plan Amendment, waivers, or by using pre-existing reimbursement structures.

These variables could be incorporated into an alert system or case record review process that flags children who might benefit from wraparound services or more intensive case management or treatment, with the goal of meeting their physical and behavioral needs so that they do not experience high degrees of placement instability. Providers could be trained on the unique developmental needs of youth in foster care; and coordinate more closely with caseworkers and foster parents on how best to meet their needs and improve their health outcomes to promote placement stability.

In addition to practice and policy implications, several other implications relate to further development and use of predictive analysis to help various service agencies. For example, this study has shown that it is possible to construct predictive models that differentiate children who experience placement instability from those who do not with reasonable accuracy. We believe this finding contributes to the growing potential to develop predictive analytic models to inform case management and service provision for child welfare, Medicaid, and other agencies.

Moreover, our results show that it is possible to develop robust models capable of predicting placement instability (and possibly other types of superutilization) by building on data systems that states may already have available, but do not already use in combination with one another. In addition, variables derived from diverse sources, such as child welfare investigations, Medicaid, and substance abuse and mental health agencies, are important predictors in our study.

This demonstrates the need to share and use data across agencies to inform policy- and case-level decision making.

To understand service use for children in foster care, combining data from the primary service providers/reimbursements is key to developing more effective service models.

Study limitations

As with any study, several limitations must be kept in mind when interpreting the results and drawing conclusions. In particular, our conceptualization of superutilization identified high service users but does not explicitly address the issue of whether high levels of service utilization are appropriate for the level of need. When reviewing these findings, it is important to note that we do not place a value on superutilization. We caution readers not to interpret high levels of service use as necessarily a negative outcome. Many children have complex health needs, for example, that warrant high levels of outpatient and inpatient services. Our findings do not attempt to make claims about the appropriate levels of service use. Rather, we simply identify high levels of service use to help child welfare, Medicaid, and other agencies learn more about those experiencing superutilization, and to identify opportunities to improve efficient and effective service provision.

Although these results may be informative for other states and localities, caution should be used when applying the results and insights from this study to other jurisdictions or time periods. For example, there may be specific programs or policy contextual factors that occurred during the study time period in these sites that may have had an unmeasured influence on the results. Nonetheless, the similarities of the results across sites, lead to more confidence in generalizing these results to other jurisdictions or guiding their own individual analyses.

The availability of data also limited our study scope. In particular, we focused our study on services linked to the child in the administrative data from site partners. We requested and assessed the available data on parents but given limitations with these data, we were not able to include services linked to parent records. Also, limited availability of Eckerd services data during the study window led to a reduced time frame for the descriptive and latent class analysis in which we included these data. Also, detailed information on CBC-purchased child welfare services and costs were minimal for the Florida sample.

While the analysis focused on data that child welfare caseworkers are likely to have access to, as with any study, we are limited to only those variables for which we have data and have included in the analysis. There may be other important factors to consider that were not available for the study. For example, cost data were unavailable or limited for several services of interest, including placement costs for Florida. Also, child assessment data were not universally available or assessment scores were limited to a total score, such as with the Child and Adolescent Needs and Strengths (CANS) assessment in Tennessee. System performance variables that would affect children's outcomes were also beyond the scope of this study (e.g., worker turnover and caseload size.)

Although the results provide potentially important insights into understanding various types of superutilization and, in particular, the factors that help predict placement instability, we emphasize that these findings do not indicate causal relationships. Neither the latent class nor the

predictive analysis results should be misinterpreted or used in any way to conclude causality for superutilization or placement instability.

Conclusions

This study addresses research questions to provide much-needed insights into superutilization of services among children and families in the child welfare system. The use of cross-system linked administrative data from child welfare and Medicaid in both sites, along with data from other substance abuse and mental health services in Florida, provides a rich set of data on service use for children in the child welfare system. The descriptive analysis alone, providing a description of superutilization of child welfare, Medicaid, and other services, contributes much-needed knowledge on system engagement and service provision for these children. Applying advanced statistical methods, specifically latent class and predictive analysis, allows us to answer nuanced questions about specific types of superutilization and what factors may be predictive of superutilization.

These analyses provide Tennessee and Florida with deeper information by which to understand the different types of children who use multiple child welfare and/or Medicaid services and the distinguishing characteristics of each. The findings underscore the value of having a standard set of assessment measures spanning multiple domains of functioning that are completed for all children who become involved with child welfare, so outcomes relative to high service use can be evaluated. In each state, these findings can inform Continuous Quality Improvement (CQI) efforts that are already underway concerning youth with a high number of placements. The research findings can lead to concrete strategies to improve the safety, permanency, health, and well-being of children in child welfare, as well as possibly reduce costs.

Table ES.2. Tennessee sample: Descriptions, thresholds, and percentage of sample identified as experiencing superutilization for each measure

	Variable description	Superutilization dimension	Mean (std. dev.)	90th pct threshold value	Number (percent) of superutilizers
Total number of custody episodes[a]	Total custody episodes in the child welfare system (age-adjusted with minimum cutoff of 2)	Frequency/ dosage	1.162 (0.452)	2	3,190 (14.7%)
Total number of placement moves[a]	Total number of placement moves across all episodes (age-adjusted)	Frequency/ dosage	3.218 (2.769)	6	3,387 (15.6%)
Total length of stay in out-of-home custody[a]	Total days in out-of-home custody across all episodes (age-adjusted)	Duration	401.188 (375.098)	872	2,722 (12.6%)
Average share of time in group home/congregate care[a]	Average share of time spent in group home or congregate care among all out-of-home placements (age-adjusted)	Intensity	7.098 (21.146)	24.138	1,827 (8.4%)
Child welfare services per year[a]	Number of child welfare service starts during contact with the child welfare system excluding case management (calculated as annual rate)	Frequency/ dosage	4.652 (6.695)	11.310	2,432 (11.2%)
Total placement cost per year[a]	Total cost of child welfare placements in custody (calculated as annual rate)	Cost	$18,217.72 (20,898.82)	$39,597.69	2,552 (11.8%)
Child welfare service cost per year[a]	Total cost of child welfare services per year (calculated as annual rate)	Cost	$1,370.888 (3,261.14)	$3,363.44	1,789 (8.3%)
Medicaid inpatient services per year[b]	Number of Medicaid inpatient physical and behavioral health services (calculated as annual rate)	Frequency/ dosage	0.101 (1.265)	0 (1,257)	1,257 (5.8%)
Medicaid outpatient services per year[b]	Number of Medicaid outpatient physical and behavioral health services (calculated as annual rate)	Frequency/ dosage	14.661 (19.140)	37.960	2,261 (10.4%)
Medicaid emergency services per year[b]	Number of Medicaid emergency physical and behavioral health services (calculated as annual rate)	Frequency/ dosage	0.990 (4.078)	2.325	2,213 (10.2%)
Superutilization sample size					**12,332 (56.9%)**

Source: [a]Tennessee DCS; [b]Tenncare.

Note: The mean, standard deviation, 90th percentile cutoff value, and number of children at or above the cutoff value are based on the distributions for the pooled study sample that exclude right-censored custody or services. As noted in this chapter and where indicated in the description section of the table, the actual means, standard deviations, and cutoff values for certain measures are based on age-adjusted values for children in the sample. This means that the cutoff values are relative to a child's age cohort, which may be different than the cutoff value for the pooled sample. The age-specific values for all variables that were age-adjusted were used to define the study sample. The sample sizes of children identified as experiencing superutilization for the age-adjusted measures reported in the table are based on the total number identified from the age-specific cutoff values.

When the 90th percentile value is zero, the next positive value was used to establish the cutoff point for defining superutilization.

Table ES.3. Florida sample: Descriptions, thresholds, and percentage of sample identified as experiencing superutilization for each measure

Variable	Description	Superutilization dimension	Mean (std. dev.)	90th pct. threshold value	Number (percent) of superutilizers
Total number of custody episodes[a]	Total number of custody episodes with at least one out-of-home placement (age-adjusted; minimum cutoff of 2)	Frequency/ dosage	1.206 (0.495)	2	894 (13.4%)
Total number of placement moves[a]	Total number of placement moves across all episodes with at least one out-of-home placement (age-adjusted)	Frequency/ dosage	3.923 (5.034)	7	1,078 (16.1%)
Total length of stay in out-of-home custody[a]	Total days in out-of-home placements across all episodes in the child welfare system (age-adjusted)	Duration	334.669 (304.149)	676	740 (11.1%)
Average share of time in group home or residential placements[a]	Share of time in group home or residential placements among total days in out-of-home placements over a lifetime (age-adjusted)	Intensity	5.900 (20.255)	9.639	609 (9.1%)
Child welfare CBC-purchased services per year[b]	Total number of child welfare (Eckerd) services during contact duration with child welfare (calculated as annual rate)	Frequency/ dosage	1.237 (5.568)	2.491	601 (9.0%)
Child welfare CBC-purchased service cost per year[b]	Total cost across all child welfare (Eckerd) services (calculated as annual rate)	Cost	$535.65 (5,494.92)	$434.524	567 (8.5%)
Mental health services per year[d]	Number of mental health treatment episodes over contact duration with child welfare system (calculated as annual rate)	Frequency/ dosage	2.212 (9.603)	1.763	560 (8.4%)
Substance abuse services per year[d]	Number of substance abuse treatment episodes over contact duration with child welfare system (calculated as annual rate)	Frequency/ dosage	1.302 (7.733)	0	262 (3.9%)
Medicaid inpatient services per year[c]	Number of Medicaid inpatient physical and behavioral health services (calculated as annual rate)	Frequency/ dosage	0.136 (0.887)	0	380 (5.7%)
Medicaid outpatient services per year[c]	Number of Medicaid outpatient physical and behavioral health services (calculated as annual rate)	Frequency/ dosage	14.017 (24.579)	32.301	762 (11.4%)
Medicaid emergency services per year[c]	Number of Medicaid emergency physical and behavioral health services (calculated as annual rate)	Frequency/ dosage	0.933 (3.321)	2.281	779 (11.6%)
Superutilization sample size					**3,726 (55.7%)**

Source: [a]Florida OCW; [b]Florida Eckerd; [c]Florida ACHA; [d]Florida SAMHIS.

Note: The mean, standard deviation, 90th percentile cutoff value, and number of children at or above the cutoff value are based on the distributions for the pooled study sample that exclude right-censored custody or services. As noted in this chapter and where indicated in the description section of the table, the actual means, standard deviations, and cutoff values for certain measures are based on age-adjusted values for children in the sample. This means that the cutoff values are relative to a child's age cohort, which may be different than the cutoff value for the pooled sample. The age-specific values for all variables that were age-adjusted were used to define the study sample. The sample sizes of children identified as experiencing superutilization for the age-adjusted measures reported in the table are based on the total number identified from the age-specific cutoff values.

When the 90th percentile value is zero, the next positive value was used to establish the cutoff point for defining superutilization.

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