Changes in Child Status During Behavioral Health Services in 2013:

Data from the Child and Adolescent Needs and Strengths Tool (CANS), Part I, Item Level Analysis

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Introduction

This is the first part of a two-part report, which together will constitute the Commonwealth's first annual Standardized Analysis as described in MassHealth's *Plan for Ongoing CANS Data Analysis and Reporting*, issued April 29, 2015.[1] It is the intention of MassHealth to produce the Standardized Analysis each year, and also to produce each year a separate report on one or more CANS topics of special interest. The current Part 1 of the Standardized Analysis report examines changes in CANS items for children and youth in Intensive Care Coordination (ICC) and also for children and youth in In-Home Therapy (IHT). A subsequent Part 2 report will look at CANS items grouped by domain and will synthesize findings and recommendations from both Part 1 and Part 2 analyses.

Before presenting data we review briefly the function of the CANS tool in the MassHealth behavioral health system, and then review the item rating system that is the source of the CANS data.

Function of the CANS

The Child and Adolescent Needs and Strengths tool (CANS), as used in child-serving systems in Massachusetts, has multiple functions, at three levels: individual, program, and system.

CANS at the individual level.

The primary function of the CANS is to support provision of the best possible care to an individual child and his or her family. The CANS prompts a thorough assessment, including a consideration of child strengths, and of cultural considerations for service planning. The CANS, written in ordinary language, also supports an ongoing dialog with the family about which needs to prioritize, and it helps to track changes in needs over time. Finally, the CANS and its associated web-based data system provide a medium for collaboration among providers working with a family.

Most of the Commonwealth's implementation efforts since the launch of the CANS within MassHealth in 2008 has focused on supporting the use of the CANS at the individual level. These efforts have included clinician training and certification

[1] CANS is the acronym for the Child and Adolescent Needs and Strengths tool, developed by John S. Lyons PhD, copyright by the Praed Foundation, and modified for use by MassHealth.

programs, information technology (IT) enhancements and end user support. The Commonwealth continues to invest in efforts that will improve the use of the CANS at the individual level. In FY2016 these include new reporting tools for clinicians, and a thoroughly revised CANS training and certification process that will help users, including thousands of outpatient clinicians, attain more skill in using the CANS within a collaborative system.

CANS at the program level.

Provider organizations can also use the CANS at the individual level, to improve practice and outcomes. By using the CANS as a regular data point in supervision, the organization can build on the individual-level functions of the CANS to oversee clinical quality and develop clinician skills. Following the launch of the new training and certification in MA state fiscal year (SFY) 2016, MassHealth plans to provide coaching to provider organizations in how to use new and existing features of the CANS IT system to improve clinical practice.

Providers can also *aggregate* CANS data across groups of children at the clinician, program or site level. In this way, a provider organization can increase its understanding of the population it serves, and of the impact of services over time. Analyzing CANS data for groups of children may be technically challenging for provider organizations. Analysis at this level requires methods and tools similar to those used at a system level, that is, statistical software and data analytic skills.[2] By developing reporting methods at a system level, for the current report and those to follow, MassHealth hopes to also develop helpful guidance and resources for providers in managing and analyzing aggregate (group) CANS data.

CANS at the system level.

This report analyzes CANS data at the statewide, MassHealth system level, and specifically at changes in CANS that occur over time for children enrolled in Intensive Care Coordination, or in In-Home Therapy. It deals with aggregated data, using item-level ratings for many children, but only for one item at a time.

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[2] Powerful open source (free) statistical software packages are now available, but the use of statistical software requires specialized skills. It would be highly desirable at a future time to develop CANS analytical tools that providers could use with only a modest amount of training.

CANS ratings and the meaning of changes in CANS item ratings

In this report we look at how specific CANS items change while children are in ICC and IHT. Recall that the four levels of a CANS item generally have the following significance:[3]

3 -- urgent intervention is needed

2 -- intervention is needed

1 -- watchful waiting, or need to gather more information, or history of a need

0 -- no evidence of a need

Items vary greatly in their frequency of endorsement. For all items, however, ratings of 3 are relatively infrequent, while the ratings of 2 and 1 may be frequent. The most frequent rating of any item is 0. Usually the focus of services will be on needs rated 2; with improvement these items drop to a rating of 1. Due to design of the CANS, it is difficult for ratings of 1 to drop to 0.[4] Ratings of 3, because of their urgency, usually drop to 2 fairly quickly, but this drop may have little impact when examining change scores across groups of children, because of the infrequency of 3s.[5]

Since there are four possible values for an item initially, and four possible values on a subsequent CANS, there are actually 4 x 4 = 16 possible pre/post patterns (including

[3] This is the schema for rating Needs, which is used for five of the six Domains (content sections) of the CANS. The Child Strengths domain uses a somewhat different schema, but maintains the levels 0 through 3 as well as the general concept that a 0 is most favorable, and a 3 the least favorable.

[4] Specifically, the fact that a history of a problem generally results in a rating of 1 creates downward "stickiness" since the history never goes away. In recent discussions John Lyons has indicated that only a "relevant history" should result in a 1. While the new interpretation will be incorporated in the revised CANS training currently under development, it has no bearing on the data set examined in this report.

[5] Although a 3 ordinarily indicates a problem of great urgency, some items can be rated a 3 because they are "disabling". Ratings of 3 in this case might not go to 2, since the disability might be enduring. MassHealth would prefer a rating of 3 to have only one meaning, related to urgency of a need; we continue discussions with Dr. Lyons on this point.

four in which the item rating does not change).[6] For simplicity we will not consider all possibilities but will discuss four categories of changes:

- If a child initially has a score of 3 or 2, which subsequently becomes a 0 or 1, we say their need on the item is "*Resolved*". This is the most common scenario for needs that are successfully addressed by a service.
- If a child's score decreases then we say their status on that item is "*Decreased / Improved*". Most improvement occurs when ratings of 2 are reduced to 1; large numbers of 1 ratings do not improve due to the design of the CANS. For this reason the rate of items Resolved is actually usually higher than the rate of items Improved.
- If a child's score increases then we say their status on that item is "*Increased/Worsened*". This can reflect an actual deterioration in status, or the acquisition of more accurate information about the severity of a need. Deterioration in status may occur for reasons related to external stressors or developmental factors, even when effective services are in place.
- If a child initially has a 0 on an item, which subsequently becomes a 2 or 3, we say a need on that item is "*Newly Identified*". We expect new needs to be identified fairly frequently during the course of services. This seems especially likely for items that we believe tend to be underrated, such as youth substance use and parental substance abuse and mental illness.

[6] While a 4 x 4 frequency table can be hard to interpret, graphic displays of categorical data (such as a "tile plot") can help to make the pattern of item change more intuitive and quickly understandable. This approach has promise for future reports on item-level CANS change analyses.

The dataset [7]

This report draws from complete CANS Five Through Twenty records entered into the CANS application on the Virtual gateway for dates of assessment between January 1, 2013 and December 31, 2014 (the "time window").[8]

The dataset was then filtered to retain only CANS records identified as produced in ICC or in IHT. For a child in ICC, all CANS records completed in ICC by a single provider organization during the time window were gathered together. For a child in IHT, all CANS records completed in IHT by a single provider organization during the time window were gathered together. Records entered by other organizations were not included because examination of CANS records suggests that reliability of CANS ratings is higher within a provider organization than across organizations. There was no requirement, however, that records be entered by the same individual Certified Assessor.

CANS item change scores were computed by taking the difference in ratings between an *initial* CANS and a *subsequent* CANS. The initial CANS was found by taking the first CANS for the child in the selected service in a nine month period (that is, no CANS were entered for the child by the provider organization for the selected service during the previous nine months). So For a child in ICC, the first ICC CANS record entered by the provider for the child in nine months was taken to be the initial record for the purpose of analysis.[9] For a child in ICC the subsequent CANS could be the third or fourth CANS in the set (counting the initial CANS as the first, and ordering the records chronologically). Since the CANS is ordinarily completed at three month intervals, the third CANS would ordinarily occur six months after the initial CANS, and the fourth CANS would ordinarily occur nine months after the initial CANS. For a child in IHT,

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[7] CBHI is grateful for the help of Josh Twomey PhD of UMass Medical School for running the CANS data analyses.

[8] Not included in this dataset are CANS for children whose caregivers declined consent to enter the full CANS into the CANS application, children whose CANS record in the application was incomplete, or children who were under five on the date of assessment. Also not included are children whose providers did not comply with the MassHealth requirement to complete the CANS.

[9] Although each CANS record is marked by the clinician as "initial" or "reassessment", we saw evidence that these designations were occasionally inaccurate, so we chose the nine-month lookback procedure as our method of identifying the *initial* CANS for the purpose of this analysis.

we chose the second and third CANS for comparison to the initial CANS, representing time periods of approximately three months and six months. (We chose shorter comparison periods for IHT than for ICC because length of stay in ICC tends to be longer than that in IHT.)

This resulted in four sets of change scores for each CANS items: change in ICC with 3 CANS, change in ICC with 4 CANS, change in IHT with 2 CANS, and change in IHT with 3 CANS. An individual child could occur in all four sets (if he or she was enrolled in ICC for at least twelve months as well as in IHT for at least nine months during the time window). We did not exclude a child's data if they were enrolled in both ICC and IHT (as often occurs) and also did not exclude a child's data based on *prior* enrollments.[10] A child enrolled in just one of the services could appear in two datasets if the enrollment was long enough (e.g. if the child had both a third and fourth CANS in ICC during the time window) or in one dataset (e.g. third but not fourth CANS in ICC) if the enrollment was shorter. A child whose enrollment was too short to produce the requisite number of CANS in the service would not appear at all.

The number of CANS records varies by service, time period, and item. The number of records for each item in the analysis may be found in Appendix 1.

Since the data reported here are calculated from all relevant CANS records, there is no sampling error, hence no reporting of confidence intervals (i.e. margin of error).

[10] Except that, as noted previously in our methodology for identifying the *initial* CANS record, we did exclude children with CANS for enrollments in the same service with the same provider in the previous nine months. Since children sometimes re-enroll in a service, it is possible that some children actually had more experience in the services than their CANS count would indicate.

Findings

Domain averages and general observations

Although most of the discussion will focus on individual CANS items, it will help to orient ourselves by looking at the average item change pattern for each CANS domain, for each service and time period. (In what follows, ICC3 and ICC4 refer to changes from a child's initial CANS to third or fourth CANS by the same provider in ICC. IHT2 and IHT3 have analogous meanings.)

The following table shows the average percentage of items falling into each of the categories of change described on page 6, by domain, for each of the four service groups, in the three domains that are most related to child functioning (Life Domain Functioning, Child Emotional / Behavioral Needs, and Risk Behaviors):[11]

Service	Domain	Decreased/ Improved	Increased/ Worsened	Resolved	Newly IDd
ICC3	Life Domain Functioning	26%	13%	30%	8%
ICC4	Life Domain Functioning	31%	15%	37%	9%
IHT2	Life Domain Functioning	25%	10%	29%	5%
IHT3	Life Domain Functioning	32%	13%	39%	6%
ICC3	Child Beh/Emo Needs	26%	10%	31%	6%
ICC4	Child Beh/Emo Needs	31%	12%	38%	8%
IHT2	Child Beh/Emo Needs	26%	9%	30%	4%
IHT3	Child Beh/Emo Needs	33%	12%	40%	6%
ICC3	Child Risk Behaviors	34%	7%	49%	3%
ICC4	Child Risk Behaviors	42%	9%	60%	4%

[11] These are unweighted means of percentages, giving each item equal weight regardless of the number of children in the denominator for the item. Thus an item rarely rated 2 or 3 would have the same weight for "percentage resolved" as an item frequently rated 2 or 3. It would also be reasonable to look at weighted means.

Service	Domain	Decreased/ Improved	Increased/ Worsened	Resolved	Newly IDd
IHT2	Child Risk Behaviors	34%	5%	48%	1%
IHT3	Child Risk Behaviors	44%	7%	62%	2%

For reasons mentioned above (the downward "stickiness" of 1s, and the infrequency of 3s), the rate of items Resolved tends to be higher than the rate of items Decreased / Improved. In what follows, the discussion will usually focus on the rate of items Resolved, since this is the outcome we usually seek in treatment: something that previously was a significant problem no longer is. Rates at which items are resolved will be highlighted in all data tables, like this.

In general, all four change categories tend to occur somewhat more frequently the longer the child is in the service. It may seem paradoxical that a longer length of stay can be simultaneously associated with higher rates of increase and higher rates of decrease; this is explicable, however, because longer stay tends to be associated with fewer children unchanged.[12]

Among these three domains, average rates of items resolved tend to be highest for Child Risk Behaviors (49 to 62 percent), with somewhat lower rates for Child Emotional / Behavioral Needs and Life Domain functioning. But as we shall see below, rates for specific items may be considerably higher or lower than the average for the domain.

The Resolved category follows the trend that children with longer duration of service have somewhat higher rates of Resolution (22 to 34 percent higher, in this sample). The data do not permit us to infer that receiving more service causes more improvement, but it seems likely that is true. In addition, children and families who are services longer may also have a higher level of engagement in the service, or may have fewer life disruptions.

Comparison of resolution rates between ICC and IHT may not be meaningful as (1) the services have somewhat different purposes and (2) many children receiving one service receive the other, either concurrently or at different times. In any case, rates are generally similar across the two services.

[12] This is not a surprising finding, as it would arise in a situation where change occurs at random (what statisticians call a "random walk" scenario).

Identification of new concerns occurs at a lower rate than one might expect, given the complexity of issues faced by children in the service population. This raises a question about whether raters consistently identify new issues in the CANS and in treatment planning as they become aware of them. At an item level the rate of Newly Identified ranges from < 1 to 29 percent. The concerns most frequently newly identified relate to family relations, including Family and Family Stress.

In the course of working with a child it is frequently important to identify and address caregiver needs. The following table shows results for the four service groups and time periods for this domain, averaging results for all items in the domain.

Service	Domain	Decreased/ Improved	Increased/ Worsened	Resolved	Newly IDd
ICC3	Caregiver Resources/Needs	19%	11%	24%	6%
ICC4	Caregiver Resources/Needs	24%	14%	30%	7%
IHT2	Caregiver Resources/Needs	20%	10%	28%	4%
IHT3	Caregiver Resources/Needs	24%	14%	36%	6%

Changes for specific items within the domain will be discussed below.

Changes in specific items

In what follows we discuss selected items and domains. Data for all items are reported in the Appendices. these data will be useful as markers for comparisons over time and with other samples of data, such a child and provider subsets.

Child Risk Behavior

The highest rates of resolution occur for items from this domain. These items represent risky behaviors are being aggressively targeted for intervention.

In the domain of Child Risk Behavior, resolution rates run from 21 to 83 percent. It is hard to know what the "right" rate should be for these items -- 83% resolved for firesetting seems very good, but still means 17% not resolved. (Fortunately, firesetting is an infrequent problem in the CANS data.) "not resolved", could mean that a child has either a 2 or 3 on the subsequent CANS. A 3 would signify that there is still imminent risk from fire-setting -- an unacceptable outcome -- while a 2 would signify that ongoing treatment is needed, but that there is not imminent risk. The child may have an excellent safety plan in place, for instance, that provides monitoring and restricts

opportunities for fire setting while treatment proceeds. In this case, "not resolved" could have two very different implications. (This underlines why it can be useful to understand change patterns in detail, in some cases by examination of the full 4 x 4 matrix of possible patterns.)

The lowest rate of resolution (21 to 35 percent) is for the Judgment item, a very different item from Fire-setting. This juxtaposition of items clearly shows how different CANS items can be, in scope and specificity, even within the same domain. Fire-setting refers to a highly specific and risky behavior, and is rarely endorsed. Judgment (that is, risky judgment) can refer to a broad range of behaviors and situations, and is one of the most frequently endorsed CANS items. Very poor judgment is common in this population and diffuse (there is no specific intervention for bad judgment, but many conceivable interventions for many potential causes). Risky judgment is undoubtedly an issue that should be addressed in service planning, but also one which we would not expect to change easily or quickly.

In general, resolution rates in this domain are highest for some of the low-frequency, high-risk concerns, such as Firesetting (61 to 83 percent), Suicide Risk (65 to 75 percent) and Self-Mutilation (54 to 70 percent), and lower for concerns related to victimization and dysfunction in social and executive functioning such as Judgment, Sanction Seeking (or deliberately provocative behavior, 36 to 48 percent), and Exploited (related to "being the object of abuse… includes a level of current risk for revictimization", 39 to 55 percent).

Child Emotional / Behavioral Needs

In the domain of Child Emotional / Behavioral Needs, rates of Resolution range from 15 to 63 percent. Again we see that commonly endorsed problems (Hyperactivity / Impulsivity, and Anxiety) often show a lower rate of resolution than those less often identified (Eating Disturbance, Psychosis).

The lowest rates of Resolution (15 to 23 percent) are for Hyperactivity / Impulsivity. This is a very frequently endorsed item and the low resolution rate might seem curious given the effectiveness of treatments (including stimulant medication) for ADHD. There are two plausible explanations for this. First, the design of the CANS makes it difficult to show improvement when a treatment is applied on a "maintenance" basis; most raters would probably rate the item 2 even though treatment was ameliorating the symptoms. Thus many children whose hyperactivity and impulsivity is effectively managed with medication (ideally, in conjunction with psychosocial intervention)

would not drop to a rating of 1. [13] Second, children in IHT or ICC in many cases have had prior treatment, so any gains from interventions such as stimulant medications may have occurred in the past. Given the frequency of ADHD as a diagnosis, provider organizations with high rates of endorsement on this item might consider reviewing their protocols for treating this condition, including coordination with the school and primary care provider. The CANS could be used to establish a sample of cases for study.

Anecdotally we know that "complex trauma" is a common experience among children and families with MassHealth. Trauma of this kind poses a steep challenge for services: while effective psychological treatments exist for anxiety and other post-traumatic symptoms, most of these were designed for treatment of discrete traumatic events, and may require much adaptation and many more sessions to address complex trauma. Furthermore, many children and families live with profound and ongoing stressors such as food insecurity, housing insecurity, and community violence. Both IHT and ICC offer the opportunity to identify and, to some extent, address some of these environmental factors that provoke and maintain traumatic symptoms. Resolution rates for items that are frequently associated with trauma are among the lowest in the domain of Child Emotional / Behavioral Needs: for Anxiety the rates are 22 to 28 percent; for Adjustment To Trauma rates are 23 to 32 percent, and for Emotional Control (very frequently endorsed), the rates are 22 to 30 percent resolved. It would be interesting to see if organizations that have trained their IHT staff in trauma specific models (such as Trauma-Focused Cognitive Behavioral Therapy, Child/Parent Psychotherapy, and the Attachment/Regulation/Competency approach) achieve higher rates of resolution than programs using treatment as usual. MassHealth is currently piloting the Modular Approach to Therapy for Children with Anxiety, Trauma, Depression and Conduct Problems (MATCH-ATDC) in IHT. It is possible that further dissemination of such models would increase resolution of trauma-related issues.[14]

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[13] MassHealth is discussing with John Lyons the possibility of changes to the CANS so that concerns addressed by maintenance treatments could be rated 1.

[14] MassHealth is planning discussions about outcomes with the Massachusetts Child Trauma Project (MCTP) which has provided much of the trauma-specific treatment training mentioned above, and which has retained CANS data for youth treated as part of the MCTP evaluation dataset.

Life Domain Functioning

Life Domain Functioning is a child need domain that includes school-related items, items related to developmental concerns, and medical concerns. Developmental delay unsurprisingly has low rates of resolution (17 to 26 percent). For learning disability and medical problems resolution ranges from 22 to 35 percent. This domain also covers level of daily functioning in the family and community. Resolution rates tend to be moderate for school related issues, which are frequently areas of concern for children in IHT and ICC (Attendance 38 to 52 percent, Behavior 33 to 47 percent, and Achievement 29 to 44 percent). Resolution for functioning in the family is relatively low (20 to 26 percent); this would seem to be an important focus for treatment and deserves continued monitoring. Providers might wish to focus on this item, ensure it is being accurately rated, and look at the interventions in place to address the child's functioning in the family. Resolution for functioning in the community ranges from 33 to 48 percent; again, this is an important area where provider organizations might need to examine closely their assessment and interventions. Examination of resolution rates for these items by provider might show variation that could be used to identify effective practices.

Caregiver needs and resources

Generally caregiver concerns are resolved at a lower rate than child needs, but it is notable that issues such as caregiver Substance Use (33 to 47 percent) and Housing Stability (30 to 42 percent) get resolved fairly often. The most common caregiver concern is Financial Resources, where resolution ranges from 20 to 26 percent. The ability of IHT and ICC to identify and work with caregivers around these kinds of issues is critical to helping children function succeed.

Transition to Adulthood

Transition to Adulthood is an important domain for transition-aged-youth. The number of items endorsed varies as the items are optional for youth under the age of 14 and a half, and each item can be marked N/A if the rater feels the item is not relevant. Denominators for items resolved in this domain tend to be small. Resolution rates vary widely, with the highest rate being for personality disorder (47 to 71 percent). Although this represents very few youth (only 71 were initially rated 2 or 3), it is surprising as personality disorders are usually considered difficult to ameliorate, and suggests that raters are re-evaluating youth more positively rather than treating their personality

disorders. This is probably a rare instance in which a rating decreases rather than increasing as a result of acquiring additional information.

Child Strengths, and Cultural Considerations

Child Strengths and Cultural Considerations help to inform pathways for treatment but are not ordinarily targets for treatment and are not analyzed in this report. Item change data from these two domains are reported in the Appendices.

Implications

This report provided a selective review of item ratings change for the two services, and for two time periods, focusing primarily on the pattern of concerns being resolved (e.g. item rated 2 or 3 is reduced to 0 or 1).

These data do not tell us know how much of the problem resolution presented in the CANS data is due to the impact of IHT and ICC. They do, however, help to calibrate our sense of what rates of resolution are low, average or high across items and domains, and they provide a yardstick for future comparison. For providers, these data yield statewide benchmarks that they may use to identify local variation.

System level

At a system level, we now have a benchmark for item change for children entering the ICC and IHT in 2013. In repeating the Standardized Analysis each year we will be able to track any changes in patterns of item change over time.

It would also be useful, when resources permit, to revisit the item-level data by subgroup, looking at both youth variables (age, sex, and primary language, for example) and at provider variables. It would also be informative to examine explicitly the relationship between the base rate of endorsement of each item (how common is the problem?) and the pattern of change for the item (how commonly does the problem get resolved?).

When tracking CANS data from year to year, it will be important to recognize that "instrumentation" effects -- changes in the behavior of raters -- can masquerade as changes in child status. Changes in the way we consider history in ratings of 1, for example (see footnote 4) could make it easier for children to move from 1 to 0, and changes in the way we rate maintenance interventions (footnote 10) could make it easier for children to move from 2 to 1. Caution will be required in trends over time in CANS change scores.

The CANS and the Massachusetts Practice Review (MPR) provide two different approaches to understanding outcomes for children in ICC and IHT. Massachusetts should do everything possible to facilitate using the two data sources together to arrive at more interpretive power. A first step is to investigate whether CANS ratings, as they appear in the medical record, are consistent with narrative in the clinical notes and in interviews with clinicians and parents. Reviewers will be asked to examine the CANS

for consistency with other data sources beginning with the October 2015 wave of MPR reviews.

Organization and individual level

At the provider organization and site level, CANS data and CANS change data can provide insight into three issues:

1. Information about the characteristics of children and families served at the site;
2. Information about how clinicians at the site interpret and rate the CANS items;
3. Information about strengths and needs of the site.

At the individual level, providers will find it easier to interpret CANS base-rate data and CANS change data when MassHealth implements new end-user reports through the CANS application on the Virtual Gateway during calendar 2016. Graphical displays will allow clinicians, families, and supervisors to visualize changes in the CANS across the last five CANS records. The new reports, combined with the consent enhancements implemented in 2015 which allow a providers to see CANS entered by other providers working with the same child, will make possible a new level of CANS practice within organizations.

Most provider organizations will find it more challenging to use data aggregated across many children (a clinicians caseload, a site or program) due to the need for specialized skills to turn raw CANS data for multiple MassHealth members into item-level or domain-level aggregated change data. As MassHealth continues to explore CANS change data, approaches for data analysis and visualization may emerge that can be developed into tools that are both accessible and friendly to providers.

Appendix 1: number of CANS records in datasets by item

Service / Time Period	Domain	Item	N
ICC3	Caregiver Resources/Needs	all	2210
ICC3	Child Beh/Emo Needs	all	2255
ICC3	Child Risk Behaviors	all	2255
ICC3	Child Strengths	all	2255
ICC3	Cultural Considerations	all	2255
ICC3	Life Domain Functioning	all	2255
ICC3	Transition to Adulthood	Personality Disorder	383
ICC3	Transition to Adulthood	Medication Adherence	564
ICC3	Transition to Adulthood	Educational Attainment	641
ICC3	Transition to Adulthood	Transportation	573
ICC3	Transition to Adulthood	Parenting Roles	289
ICC3	Transition to Adulthood	Independent Living	618
ICC3	Transition to Adulthood	Financial Resources	558
ICC4	Caregiver Resources/Needs	all	1471
ICC4	Child Beh/Emo Needs	all	1497
ICC4	Child Risk Behaviors	all	1497
ICC4	Child Strengths	all	1497
ICC4	Cultural Considerations	all	1497
ICC4	Life Domain Functioning	all	1497
ICC4	Transition to Adulthood	Personality Disorder	238
ICC4	Transition to Adulthood	Medication Adherence	361
ICC4	Transition to Adulthood	Educational Attainment	409
ICC4	Transition to Adulthood	Parenting Roles	171

ICC4	Transition to Adulthood	Financial Resources	360
ICC4	Transition to Adulthood	Independent Living	396
ICC4	Transition to Adulthood	Transportation	368
IHT2	Caregiver Resources/Needs	all	6248
IHT2	Child Beh/Emo Needs	all	6318
IHT2	Child Risk Behaviors	all	6317
IHT2	Child Strengths	all	6318
IHT2	Cultural Considerations	Discrimination/Bias	6318
IHT2	Cultural Considerations	Agreement (Strengths/Needs)	6318
IHT2	Cultural Considerations	Cultural Identity	6317
IHT2	Cultural Considerations	Youth/Fam Relationship to System	6318
IHT2	Cultural Considerations	Cultural Differences	6318
IHT2	Cultural Considerations	Language	6318
IHT2	Life Domain Functioning	Sexuality	6318
IHT2	Life Domain Functioning	School Attendance	6318
IHT2	Life Domain Functioning	Self Care	6318
IHT2	Life Domain Functioning	Community	6317
IHT2	Life Domain Functioning	School Behavior	6318
IHT2	Life Domain Functioning	School Achievement	6318
IHT2	Life Domain Functioning	Medical/Physical	6317
IHT2	Life Domain Functioning	Social Functioning	6318
IHT2	Life Domain Functioning	Learning Disability	6318
IHT2	Life Domain Functioning	Family	6318
IHT2	Life Domain Functioning	Developmental Delay	6317

IHT2	Transition to Adulthood	Personality Disorder	1184
IHT2	Transition to Adulthood	Parenting Roles	928
IHT2	Transition to Adulthood	Medication Adherence	1514
IHT2	Transition to Adulthood	Educational Attainment	1752
IHT2	Transition to Adulthood	Transportation	1639
IHT2	Transition to Adulthood	Financial Resources	1577
IHT2	Transition to Adulthood	Independent Living	1656
IHT3	Caregiver Resources/Needs	all	3972
IHT3	Child Beh/Emo Needs	all	4016
IHT3	Child Risk Behaviors	all	4016
IHT3	Child Strengths	all	4016
IHT3	Cultural Considerations	all	4016
IHT3	Life Domain Functioning	all	4016
IHT3	Transition to Adulthood	Personality Disorder	674
IHT3	Transition to Adulthood	Medication Adherence	881
IHT3	Transition to Adulthood	Parenting Roles	507
IHT3	Transition to Adulthood	Educational Attainment	1034
IHT3	Transition to Adulthood	Transportation	954
IHT3	Transition to Adulthood	Financial Resources	914
IHT3	Transition to Adulthood	Independent Living	968

Appendix 2: Item level analysis for children with 3 CANS (9 months) in ICC

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	NewlyID
Caregiver Resources/Needs	Developmental Delay	23%	2%	10%	0%
Caregiver Resources/Needs	Family Stress	15%	18%	16%	24%
Caregiver Resources/Needs	Financial Resources	17%	16%	20%	9%
Caregiver Resources/Needs	Housing Stability	30%	11%	37%	4%
Caregiver Resources/Needs	Involvement	20%	9%	35%	2%
Caregiver Resources/Needs	Medical/Physical	18%	11%	20%	4%
Caregiver Resources/Needs	Mental Health	12%	18%	18%	7%
Caregiver Resources/Needs	Natural Supports	20%	11%	23%	6%
Caregiver Resources/Needs	Organization	18%	13%	26%	4%
Caregiver Resources/Needs	Substance Use	17%	4%	33%	1%
Caregiver Resources/Needs	Supervision	23%	12%	30%	4%
Child Beh/Emo Needs	Adjustment to Trauma	23%	12%	23%	4%
Child Beh/Emo Needs	Anxiety	19%	15%	22%	11%

Appendix 2: Item level analysis for children with 3 CANS (9 months) in ICC

Child Beh/Emo Needs	Conduct	32%	9%	41%	3%
Child Beh/Emo Needs	Depression	25%	12%	30%	5%
Child Beh/Emo Needs	Eating Disturbance	32%	6%	43%	1%
Child Beh/Emo Needs	Emotional Control	23%	13%	22%	14%
Child Beh/Emo Needs	Hyperactivity/Impulsivity	19%	12%	15%	12%
Child Beh/Emo Needs	Oppositional	25%	14%	24%	9%
Child Beh/Emo Needs	Psychosis	34%	4%	53%	1%
Child Beh/Emo Needs	Substance Use	25%	5%	34%	1%
Child Risk Behaviors	Bullying	37%	7%	50%	2%
Child Risk Behaviors	Danger to Others	32%	11%	47%	4%
Child Risk Behaviors	Delinquent Behavior	33%	6%	43%	2%
Child Risk Behaviors	Exploited	30%	8%	39%	2%
Child Risk Behaviors	Fire Setting	40%	1%	65%	0%
Child Risk Behaviors	Judgment	19%	16%	21%	12%
Child Risk Behaviors	Other Self Harm	33%	8%	47%	3%
Child Risk Behaviors	Runaway	37%	6%	52%	1%
Child Risk Behaviors	Sanction Seeking	30%	10%	38%	4%
Child Risk Behaviors	Self Mutilation	40%	5%	59%	1%
Child Risk Behaviors	Sexual Aggression	44%	3%	62%	1%
Child Risk Behaviors	Suicide Risk	39%	6%	69%	2%
Child Strengths	Community Connections	22%	11%	24%	9%
Child Strengths	Educational System	26%	10%	38%	6%
Child Strengths	Family	16%	14%	23%	12%
Child Strengths	Interpersonal	18%	10%	21%	11%
Child Strengths	Optimism	18%	11%	24%	9%
Child Strengths	Resiliency	20%	10%	22%	10%

Appendix 2: Item level analysis for children with 3 CANS (9 months) in ICC

Child Strengths	Spiritual/Religious	16%	13%	13%	10%
Child Strengths	Talents/Interests	20%	9%	31%	6%
Child Strengths	Vocational	15%	14%	10%	18%
Cultural Considerations	Agreement (Strengths/Needs)	29%	10%	36%	4%
Cultural Considerations	Cultural Differences	24%	6%	31%	2%
Cultural Considerations	Cultural Identity	29%	3%	37%	1%
Cultural Considerations	Discrimination/Bias	36%	2%	43%	1%
Cultural Considerations	Language	13%	2%	10%	0%
Cultural Considerations	Youth/Fam Relationship to System	27%	11%	39%	5%
Life Domain Functioning	Community	25%	13%	33%	7%
Life Domain Functioning	Developmental Delay	20%	6%	18%	1%
Life Domain Functioning	Family	21%	17%	22%	20%
Life Domain Functioning	Learning Disability	17%	12%	22%	4%
Life Domain Functioning	Medical/Physical	23%	8%	25%	2%
Life Domain Functioning	School Achievement	29%	20%	33%	14%
Life Domain Functioning	School Attendance	38%	15%	44%	6%

Appendix 2: Item level analysis for children with 3 CANS (9 months) in ICC

Life Domain Functioning	School Behavior	35%	16%	42%	10%
Life Domain Functioning	Self Care	21%	11%	29%	3%
Life Domain Functioning	Sexuality	35%	6%	44%	2%
Life Domain Functioning	Social Functioning	22%	15%	22%	14%
Transition to Adulthood	Educational Attainment	26%	16%	28%	11%
Transition to Adulthood	Financial Resources	13%	14%	12%	7%
Transition to Adulthood	Independent Living	13%	17%	14%	8%
Transition to Adulthood	Medication Adherence	25%	16%	33%	7%
Transition to Adulthood	Parenting Roles	23%	5%	15%	0%
Transition to Adulthood	Personality Disorder	33%	6%	50%	1%
Transition to Adulthood	Transportation	20%	12%	19%	6%

Appendix 3: Item level analysis for children with 4 CANS (12 months) in ICC

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Caregiver Resources/Needs	Developmental Delay	27%	3%	13%	0%
Caregiver Resources/Needs	Family Stress	19%	19%	19%	29%
Caregiver Resources/Needs	Financial Resources	21%	19%	25%	12%
Caregiver Resources/Needs	Housing Stability	34%	14%	40%	3%
Caregiver Resources/Needs	Involvement	25%	11%	46%	2%
Caregiver Resources/Needs	Medical/Physical	19%	15%	20%	5%
Caregiver Resources/Needs	Mental Health	16%	21%	23%	8%
Caregiver Resources/Needs	Natural Supports	25%	14%	30%	10%
Caregiver Resources/Needs	Organization	25%	16%	37%	6%
Caregiver Resources/Needs	Substance Use	27%	5%	41%	1%
Caregiver Resources/Needs	Supervision	27%	14%	34%	5%
Child Beh/Emo Needs	Adjustment to Trauma	29%	14%	29%	5%
Child Beh/Emo Needs	Anxiety	22%	16%	25%	17%
Child Beh/Emo Needs	Conduct	39%	10%	55%	4%

Appendix 3: Item level analysis for children with 4 CANS (12 months) in ICC

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Child Beh/Emo Needs	Depression	28%	15%	35%	7%
Child Beh/Emo Needs	Eating Disturbance	46%	7%	63%	1%
Child Beh/Emo Needs	Emotional Control	26%	14%	24%	18%
Child Beh/Emo Needs	Hyperactivity/Impulsivity	23%	14%	20%	12%
Child Beh/Emo Needs	Oppositional	29%	17%	31%	11%
Child Beh/Emo Needs	Psychosis	41%	5%	56%	1%
Child Beh/Emo Needs	Substance Use	28%	5%	37%	1%
Child Risk Behaviors	Bullying	48%	9%	68%	3%
Child Risk Behaviors	Danger to Others	35%	14%	49%	5%
Child Risk Behaviors	Delinquent Behavior	40%	7%	61%	2%
Child Risk Behaviors	Exploited	40%	9%	55%	3%
Child Risk Behaviors	Fire Setting	53%	2%	79%	0%
Child Risk Behaviors	Judgment	23%	21%	25%	19%
Child Risk Behaviors	Other Self Harm	46%	10%	64%	3%
Child Risk Behaviors	Runaway	47%	8%	69%	2%
Child Risk Behaviors	Sanction Seeking	37%	13%	46%	5%
Child Risk Behaviors	Self Mutilation	47%	6%	64%	1%
Child Risk Behaviors	Sexual Aggression	47%	4%	65%	1%
Child Risk Behaviors	Suicide Risk	41%	8%	69%	2%
Child Strengths	Community Connections	26%	14%	28%	11%
Child Strengths	Educational System	31%	14%	49%	10%
Child Strengths	Family	20%	16%	27%	17%
Child Strengths	Interpersonal	23%	13%	28%	15%
Child Strengths	Optimism	23%	14%	30%	9%

Appendix 3: Item level analysis for children with 4 CANS (12 months) in ICC

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Child Strengths	Resiliency	25%	13%	28%	15%
Child Strengths	Spiritual/Religious	21%	16%	17%	12%
Child Strengths	Talents/Interests	24%	12%	38%	8%
Child Strengths	Vocational	20%	19%	13%	24%
Cultural Considerations	Agreement (Strengths/Needs)	37%	11%	51%	4%
Cultural Considerations	Cultural Differences	29%	9%	35%	3%
Cultural Considerations	Cultural Identity	33%	4%	39%	1%
Cultural Considerations	Discrimination/Bias	43%	3%	49%	1%
Cultural Considerations	Language	16%	3%	13%	1%
Cultural Considerations	Youth/Fam Relationship to System	32%	14%	45%	6%
Life Domain Functioning	Community	31%	16%	42%	8%
Life Domain Functioning	Developmental Delay	22%	8%	19%	1%
Life Domain Functioning	Family	24%	17%	25%	26%
Life Domain Functioning	Learning Disability	21%	15%	29%	4%
Life Domain Functioning	Medical/Physical	27%	11%	31%	2%

Appendix 3: Item level analysis for children with 4 CANS (12 months) in ICC

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Life Domain Functioning	School Achievement	35%	22%	43%	17%
Life Domain Functioning	School Attendance	45%	17%	51%	7%
Life Domain Functioning	School Behavior	41%	19%	47%	10%
Life Domain Functioning	Self Care	27%	15%	37%	4%
Life Domain Functioning	Sexuality	45%	7%	51%	2%
Life Domain Functioning	Social Functioning	26%	16%	27%	17%
Transition to Adulthood	Educational Attainment	33%	23%	39%	16%
Transition to Adulthood	Financial Resources	20%	16%	25%	8%
Transition to Adulthood	Independent Living	15%	21%	19%	13%
Transition to Adulthood	Medication Adherence	32%	19%	43%	10%
Transition to Adulthood	Parenting Roles	30%	4%	30%	2%
Transition to Adulthood	Personality Disorder	35%	7%	71%	1%
Transition to Adulthood	Transportation	23%	14%	19%	8%

Appendix 4: Item level analysis for children with 2 CANS (3 months) in IHT

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Caregiver Resources/Needs	Developmental Delay	26%	3%	35%	0%
Caregiver Resources/Needs	Family Stress	15%	15%	18%	13%
Caregiver Resources/Needs	Financial Resources	16%	13%	20%	5%
Caregiver Resources/Needs	Housing Stability	26%	10%	30%	2%
Caregiver Resources/Needs	Involvement	22%	10%	42%	2%
Caregiver Resources/Needs	Medical/Physical	17%	11%	22%	3%
Caregiver Resources/Needs	Mental Health	13%	14%	20%	5%
Caregiver Resources/Needs	Natural Supports	20%	12%	25%	5%
Caregiver Resources/Needs	Organization	20%	11%	30%	2%
Caregiver Resources/Needs	Substance Use	20%	4%	37%	1%
Caregiver Resources/Needs	Supervision	22%	10%	29%	3%
Child Beh/Emo Needs	Adjustment to Trauma	24%	10%	25%	3%
Child Beh/Emo Needs	Anxiety	20%	13%	22%	7%
Child Beh/Emo Needs	Conduct	32%	7%	40%	2%

Appendix 4: Item level analysis for children with 2 CANS (3 months) in IHT

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Child Beh/Emo Needs	Depression	23%	11%	28%	4%
Child Beh/Emo Needs	Eating Disturbance	36%	4%	42%	1%
Child Beh/Emo Needs	Emotional Control	22%	12%	23%	8%
Child Beh/Emo Needs	Hyperactivity/Impulsivity	21%	12%	19%	6%
Child Beh/Emo Needs	Oppositional	25%	13%	25%	7%
Child Beh/Emo Needs	Psychosis	37%	3%	45%	1%
Child Beh/Emo Needs	Substance Use	24%	3%	34%	0%
Child Risk Behaviors	Bullying	34%	6%	46%	2%
Child Risk Behaviors	Danger to Others	32%	7%	44%	1%
Child Risk Behaviors	Delinquent Behavior	33%	4%	46%	1%
Child Risk Behaviors	Exploited	28%	6%	40%	2%
Child Risk Behaviors	Fire Setting	40%	1%	61%	0%
Child Risk Behaviors	Judgment	21%	12%	26%	5%
Child Risk Behaviors	Other Self Harm	40%	5%	56%	1%
Child Risk Behaviors	Runaway	39%	4%	54%	1%
Child Risk Behaviors	Sanction Seeking	30%	8%	36%	2%
Child Risk Behaviors	Self Mutilation	37%	3%	54%	1%
Child Risk Behaviors	Sexual Aggression	39%	2%	42%	0%
Child Risk Behaviors	Suicide Risk	38%	4%	65%	1%
Child Strengths	Community Connections	21%	13%	22%	9%
Child Strengths	Educational System	23%	11%	37%	4%
Child Strengths	Family	17%	13%	21%	11%
Child Strengths	Interpersonal	18%	12%	21%	10%
Child Strengths	Optimism	19%	11%	26%	8%

Appendix 4: Item level analysis for children with 2 CANS (3 months) in IHT

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Child Strengths	Resiliency	20%	11%	24%	8%
Child Strengths	Spiritual/Religious	17%	14%	13%	10%
Child Strengths	Talents/Interests	20%	11%	28%	6%
Child Strengths	Vocational	16%	16%	12%	12%
Cultural Considerations	Agreement (Strengths/Needs)	26%	8%	35%	2%
Cultural Considerations	Cultural Differences	24%	5%	31%	1%
Cultural Considerations	Cultural Identity	25%	3%	32%	1%
Cultural Considerations	Discrimination/Bias	28%	3%	41%	1%
Cultural Considerations	Language	20%	3%	16%	0%
Cultural Considerations	Youth/Fam Relationship to System	28%	8%	32%	2%
Life Domain Functioning	Community	24%	11%	34%	3%
Life Domain Functioning	Developmental Delay	21%	5%	17%	1%
Life Domain Functioning	Family	20%	12%	20%	15%
Life Domain Functioning	Learning Disability	19%	9%	23%	2%
Life Domain Functioning	Medical/Physical	24%	6%	26%	1%

Appendix 4: Item level analysis for children with 2 CANS (3 months) in IHT

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Life Domain Functioning	School Achievement	24%	16%	29%	7%
Life Domain Functioning	School Attendance	34%	11%	38%	3%
Life Domain Functioning	School Behavior	30%	14%	33%	6%
Life Domain Functioning	Self Care	23%	10%	37%	2%
Life Domain Functioning	Sexuality	31%	5%	38%	1%
Life Domain Functioning	Social Functioning	20%	14%	23%	9%
Transition to Adulthood	Educational Attainment	20%	14%	25%	7%
Transition to Adulthood	Financial Resources	15%	12%	19%	4%
Transition to Adulthood	Independent Living	14%	13%	18%	6%
Transition to Adulthood	Medication Adherence	23%	12%	30%	3%
Transition to Adulthood	Parenting Roles	27%	5%	32%	1%
Transition to Adulthood	Personality Disorder	27%	5%	47%	1%
Transition to Adulthood	Transportation	21%	11%	24%	3%

Appendix 5: Item level analysis for children with 3 CANS (9 months) in IHT

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Caregiver Resources/Needs	Developmental Delay	30%	4%	39%	1%
Caregiver Resources/Needs	Family Stress	18%	20%	22%	22%
Caregiver Resources/Needs	Financial Resources	20%	19%	26%	7%
Caregiver Resources/Needs	Housing Stability	35%	12%	42%	3%
Caregiver Resources/Needs	Involvement	27%	13%	57%	3%
Caregiver Resources/Needs	Medical/Physical	21%	15%	25%	5%
Caregiver Resources/Needs	Mental Health	16%	21%	26%	7%
Caregiver Resources/Needs	Natural Supports	25%	16%	33%	7%
Caregiver Resources/Needs	Organization	25%	15%	38%	4%
Caregiver Resources/Needs	Substance Use	23%	5%	47%	1%
Caregiver Resources/Needs	Supervision	27%	15%	39%	5%
Child Beh/Emo Needs	Adjustment to Trauma	31%	13%	32%	6%
Child Beh/Emo Needs	Anxiety	24%	18%	28%	13%
Child Beh/Emo Needs	Conduct	41%	8%	54%	2%

Appendix 5: Item level analysis for children with 3 CANS (9 months) in IHT

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Child Beh/Emo Needs	Depression	29%	15%	36%	6%
Child Beh/Emo Needs	Eating Disturbance	45%	6%	58%	1%
Child Beh/Emo Needs	Emotional Control	29%	15%	30%	15%
Child Beh/Emo Needs	Hyperactivity/Impulsivity	25%	15%	23%	9%
Child Beh/Emo Needs	Oppositional	32%	17%	35%	10%
Child Beh/Emo Needs	Psychosis	46%	4%	61%	0%
Child Beh/Emo Needs	Substance Use	32%	4%	41%	1%
Child Risk Behaviors	Bullying	42%	9%	60%	2%
Child Risk Behaviors	Danger to Others	41%	10%	61%	2%
Child Risk Behaviors	Delinquent Behavior	45%	5%	61%	1%
Child Risk Behaviors	Exploited	38%	8%	53%	2%
Child Risk Behaviors	Fire Setting	50%	2%	83%	1%
Child Risk Behaviors	Judgment	26%	16%	35%	7%
Child Risk Behaviors	Other Self Harm	50%	7%	70%	2%
Child Risk Behaviors	Runaway	49%	5%	66%	1%
Child Risk Behaviors	Sanction Seeking	38%	11%	48%	4%
Child Risk Behaviors	Self Mutilation	47%	5%	70%	1%
Child Risk Behaviors	Sexual Aggression	54%	2%	57%	1%
Child Risk Behaviors	Suicide Risk	46%	6%	75%	1%
Child Strengths	Community Connections	25%	16%	30%	12%
Child Strengths	Educational System	29%	14%	52%	5%
Child Strengths	Family	22%	18%	28%	17%
Child Strengths	Interpersonal	24%	15%	28%	13%
Child Strengths	Optimism	24%	15%	35%	10%

Appendix 5: Item level analysis for children with 3 CANS (9 months) in IHT

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Child Strengths	Resiliency	26%	13%	31%	9%
Child Strengths	Spiritual/Religious	22%	19%	18%	15%
Child Strengths	Talents/Interests	26%	14%	37%	7%
Child Strengths	Vocational	22%	21%	17%	19%
Cultural Considerations	Agreement (Strengths/Needs)	34%	11%	49%	3%
Cultural Considerations	Cultural Differences	32%	6%	40%	2%
Cultural Considerations	Cultural Identity	31%	4%	38%	1%
Cultural Considerations	Discrimination/Bias	35%	5%	53%	1%
Cultural Considerations	Language	26%	3%	19%	1%
Cultural Considerations	Youth/Fam Relationship to System	34%	11%	45%	3%
Life Domain Functioning	Community	33%	14%	48%	4%
Life Domain Functioning	Developmental Delay	28%	6%	26%	1%
Life Domain Functioning	Family	25%	15%	26%	22%
Life Domain Functioning	Learning Disability	25%	12%	31%	3%
Life Domain Functioning	Medical/Physical	30%	8%	35%	1%

Domain	Item	Decreased/ Improved	Increased/ Worsened	Resolved	Newly.ID
Life Domain Functioning	School Achievement	31%	20%	39%	10%
Life Domain Functioning	School Attendance	45%	14%	52%	4%
Life Domain Functioning	School Behavior	37%	18%	42%	8%
Life Domain Functioning	Self Care	30%	13%	47%	3%
Life Domain Functioning	Sexuality	41%	7%	56%	2%
Life Domain Functioning	Social Functioning	26%	18%	30%	12%
Transition to Adulthood	Educational Attainment	26%	18%	37%	8%
Transition to Adulthood	Financial Resources	20%	17%	24%	4%
Transition to Adulthood	Independent Living	20%	17%	23%	9%
Transition to Adulthood	Medication Adherence	30%	18%	50%	8%
Transition to Adulthood	Parenting Roles	32%	5%	44%	2%
Transition to Adulthood	Personality Disorder	38%	6%	67%	1%
Transition to Adulthood	Transportation	27%	14%	32%	3%