

TOOLKIT

for Analysis of Child and Family Outcomes



Virginia Department of
Behavioral Health &
Developmental Services



Infant & Toddler
Connection of Virginia

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Toolkit for Analysis of Child and Family Outcome Data

Introduction:

There are many reasons and ways to look at child and family outcome data. Analyzing child and family outcome data can help local systems understand:

- The quality and completeness of their data,
- Their current performance with regard to each outcome,
- How their performance has changed over time and how it compares to state results and targets, and
- How to further study and/or improve outcomes.

Virginia has a number of reports and tools available to assist local systems in analyzing their child and family outcome data. This toolkit packages those resources into one place, organized as follows:

- Important types of data analyses, including what reports and tools support each type of analysis, and
- An index of reports and tools, including how and why to use each tool, where to find it and what information it provides.

Part 1 - Types of Data Analysis & Tools to Use

Data Quality – Data Completeness:

Part of ensuring high quality data is ensuring the outcome data includes enough children and families to accurately represent the experience of all children and families in your local system.

Child Outcomes

In Virginia, local systems are expected to have complete data (entry and exit ratings) for at least 90% of children who exit early intervention after at least 6 months of service. Entry data is expected for all children who are under 30 months of age at entry.

Where do I find the Data?

- ITOTS Reports – OSEP Verification/Monitoring Reports section - Initial Progress Data Not Entered Report
- ITOTS Reports - OSEP Verification/Monitoring Reports section - Adhoc Report
- ITOTS Reports – Child Progress section - Child Progress Data Verification Report
- ITOTS Reports – Child Progress section – Child Progress Analysis Report

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Analysis/Actions:

Entry –

- If there are children on this report, do you know why? Is there a reason that child assessment ratings are not entered in ITOTS at the same time the IFSP date is entered?
- Do you need to review the process/requirements with staff?

Exit -

- Compare local percentage of exit data to state target
- Compare local percentage over time
- Use ITOTS Child Progress Analysis Report and/or ITOTS Adhoc Report and/or Child Progress Data Verification Report to identify children with missing exit data
 - Determine why exit ratings were not entered for those children
- Take actions as needed to ensure exit ratings are completed (e.g., provide training, revise local procedures, revise contracts with providers, etc.)

Family Outcomes

The infant & Toddler Connection of Virginia sets an annual state target for the family survey response rate expected for local systems.

Where do I find the Data?

Provided by the state office on your annual determinations form and local system profile.

Analysis/Actions:

- Compare local response rate to state response rate
- Compare local response rate over time
- Review and revise, as needed, local procedures for informing families about the survey, encouraging families to respond to the survey, providing survey results to families, etc.

Data Quality – Pattern Checking

The second aspect of data quality is checking to see that outcome data fall within reasonably expected patterns and ranges. We look at this with respect to several components of the child outcome data:

Percentages for each progress category

The Early Childhood Technical Assistance (ECTA) Center used previous national child outcome data and other national data sources to identify reasonable patterns about expected percentages in each progress category:

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	Progress Categories- Expected Pattern and State Status				
	a	b	c	d	e
Expected Pattern	0%-5%	5%-50%	5%-50%	5%-50%	5%-65%

Where do I find the Data?

ITOTS Reports – Child Progress section - Child Progress Report (Entry to Exit Comparison)

Analysis/Actions:

- Are there unexpected patterns (percentage in progress category falls outside the expected patterns in the table above)?
- If so, and especially if numbers are small, is the difference meaningful? (Use the Meaningful Differences Calculator to find out)
- If there are meaningful differences, the Child Progress Analysis report, the Adhoc report or the Child Progress Data Verification report can be used to identify the progress categories for specific children. Confirm that the ratings were appropriate in each instance by reviewing the team assessment narrative in the child's IFSP and/or contact notes.

Patterns Across and Within Outcomes

As indicated in the Pattern Checking Guide from the Early Childhood Technical Assistance (ECTA) Center, certain patterns in child outcome ratings and progress are expected, including:

- Children will differ from each other in reasonable ways
- Functioning in one outcome area is related to functioning in the other outcome areas
- Functioning at entry in one outcome area is related to functioning at exit in that same outcome area
- Outcome ratings should be related to the nature of the child's disability/delay.

NOTE: Unusual patterns do not necessarily mean that the data is inaccurate. They are simply an indication that you need to look more closely to see if the data is accurate.

Read more at http://ectacenter.org/~pdfs/eco/pattern_checking_table.pdf.

Where do I find the Data?

- ITOTS Report – Child Progress section – Child Progress Analysis Report
- ITOTS Reports - OSEP Verification/Monitoring Reports section - Adhoc Report
- ITOTS Reports – Child Progress section - Child Progress Data Verification Report

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Analysis/Actions:

- Look at the three entry ratings for each child. Is there a difference of 3 or more across outcomes?
- Look at the three exit ratings for each child. Is there a difference of 3 or more across the three outcomes?
- Look at the difference between entry and exit ratings for each child for each outcome. Do any differ by 3 or more points?
- Look at the entry and exit ratings across children. Are there any patterns evident such as all children start with low ratings and all children leave with high ratings across all three outcomes (rather than seeing variation)?
- Look for ratings of 7 across all three outcomes at entry
- Are there children with an N indicating no new skills over their entire time in early intervention in that outcome area?
- Are there patterns that appear to indicate that all children are rated low at entry and high at exit?
- Are there more than a few in category a (which indicates that the child did not demonstrate ANY new skills)?
- Are there any patterns across specific outcomes that indicate that none or very few of the children received either very high or very low scores? (That is, do most of the children have the same general rating on either entry or exit for any of the three child outcomes)
- Depending on patterns observed:
 - Review records of individual children where unusual patterns were seen to see if there is a reason for the rating, for the absence of ratings, for N, etc. Unusual patterns may reflect the reality – or may reflect data quality issues.
 - If patterns are seen across all children or children with specific providers or service coordinators, follow up to determine if additional training/guidance is needed.
 - Consideration of population served that may help explain the unusual patterns.

Comparison of Outcome Results:

Local systems also are expected to look at their actual local child and family outcome results. Beneficial analyses include a comparison of local results:

- over time
- to state target
- to state results

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The Early Childhood Technical Assistance (ECTA) Center summarizes the main types of changes that occur over time and possible interpretations.

Types of Change	2008-09 → 2013-14
<u>Small variations</u> from year to year are expected	
<u>Large consistent increases</u> are good news particularly when linked to programmatic changes	
<u>Large consistent decreases</u> require explanation (e.g. changing population)	
<u>Large up and down changes</u> are an indicator of questionable data quality and require explanation	

Where do I find the Data?

- ITOTS Reports – Child Progress section - Child Progress Report (Entry to Exit Comparison)
- Communications from the State Part C Office (family outcome results, including response rates)

Analysis/Actions:

- Compare local results to the previous year. Did the results increase or decrease? Are the differences meaningful (use the Meaningful Differences Calculator)?
- Look at your local results over several years. Use the ECTA table above to consider the type of change you see for your local results and why that might be the case.
- Compare local results to the state target. If you did not meet the target, was there a meaningful difference between your local results and the state target (use the Meaningful Differences Calculator)?
- Compare local results to the state results. Was there a meaningful difference between your local results and the state results (use the Meaningful Differences Calculator)?
- Use the Local System Profile to graph and display your data.
- As needed, look at additional data and/or have staff discussions to explain changes or differences (e.g. if you have large up and down changes in your local results over time).
- Plan for system improvements, if appropriate based on your findings.

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Part 2 – Index of Tools and Reports

Name of Tool	Initial Progress Assessment Not Entered
Location of Report	ITOTS Reports - OSEP Data Verification and Monitoring
Purpose of Report	To identify children who have an IFSP, but who do not yet have entry assessment data entered in ITOTS
Report Specifications	<ul style="list-style-type: none"> • IFSP date must be on or before the report date. • Age in months at intake must be less than 30 months. • Calculation of age in months at intake: difference in days between date of birth and IFSP date, divided by 365.25, multiplied by 12, rounded to 2 decimal places. • An initial progress assessment must not exist: the first assessment for the child must have been performed on or after the first referral where the outcome was “Eligible, Will Receive Services” and within 14 days of the IFSP Date
Instructions	<ul style="list-style-type: none"> • Select the date of the report • Select either View Report (pdf) or “export to excel” • Review children listed on the report, if any
Analysis/Actions	<ul style="list-style-type: none"> • If there are children on this report, do you know why? Is there a reason that child assessment ratings are not entered in ITOTS at the same time the IFSP date is entered? • Do you need to review the process/requirements with staff?

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Name of Tool	Adhoc Report
Location of Report	ITOTS Reports - OSEP Data Verification and Monitoring
Purpose of Report	To allow for a wide variety of reports depending on the user's selection.
Report Specifications	<p>Date range options include:</p> <ul style="list-style-type: none"> • All Open Children (Inaccurate) • IFSP Date • Date of Birth • Date of Closure <p>Data is grouped into six categories:</p> <ul style="list-style-type: none"> • Demographics (at least one selection from this category must be made) • Intake • Eligibility • Services • Discharge • Outcomes <p>Note: Pending the criteria selected, children will be duplicated within your report.</p>
Instructions	<p><i>Using the Report for Analysis of Quality and Completeness of Child Outcome Data</i></p> <ul style="list-style-type: none"> • Open the Adhoc report in ITOTS (from the OSEP Verification/Monitoring Reports) • Enter the begin date and end date for the period you wish to review. • Select your local system. • Select one of the following desired parameters from the "Date Selection" dropdown menu: <ul style="list-style-type: none"> ○ All Open Children ○ Date of Birth ○ Date of Closure ○ IFSP Date • Select the parameters from the Data Groups to Include in the Report based on what you will be reviewing: <ul style="list-style-type: none"> ○ To review data completeness and child outcome ratings (patterns), select: <ul style="list-style-type: none"> ▪ Demographics – Child's full name and DOB ▪ Intake - IFSP Date ▪ Discharge – Date of Closure and Transition Destination ▪ Outcomes – Outcome ID, Assessment Date and Relationship /Knowledge /Meet Needs

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Name of Tool	Adhoc Report
	<div style="border-bottom: 1px solid #ccc; margin-bottom: 10px;"> <h3 style="color: #6aa84f; margin: 0;">Adhoc Report</h3> </div> <div style="margin-bottom: 10px;"> <p>▶ Begin Date: <input style="width: 100px;" type="text" value="1/1/2016"/></p> <p>▶ End Date: <input style="width: 100px;" type="text" value="6/30/2016"/> ▶ Date <input style="border: none; border-bottom: 1px solid #ccc;" type="text" value="Date of Closure"/> ▼</p> <p>▶ Local System: <input style="border: none; border-bottom: 1px solid #ccc;" type="text" value="ALL"/> ▼</p> </div> <h3 style="color: #6aa84f; margin: 0;">Select Data Groups to Include in Report</h3> <div style="margin-bottom: 10px;"> <p><input checked="" type="checkbox"/> Demographics</p> <p><input checked="" type="checkbox"/> Child's Full Name <input type="checkbox"/> Address <input type="checkbox"/> SSN <input checked="" type="checkbox"/> DOB <input type="checkbox"/> City/County</p> <p><input type="checkbox"/> Race <input type="checkbox"/> Gender <input type="checkbox"/> Referral Source <input type="checkbox"/> Date of Referral <input type="checkbox"/> Intake Date</p> </div> <div style="margin-bottom: 10px;"> <p><input checked="" type="checkbox"/> Intake</p> <p><input checked="" type="checkbox"/> IFSP Date <input type="checkbox"/> Mitigating Circumstances <input type="checkbox"/> Evaluated/Results</p> </div> <div style="margin-bottom: 10px;"> <p><input type="checkbox"/> Eligibility</p> <p><input type="checkbox"/> Services</p> </div> <div style="margin-bottom: 10px;"> <p><input checked="" type="checkbox"/> Discharge</p> <p><input checked="" type="checkbox"/> Date Of Closure <input checked="" type="checkbox"/> Transition Destination</p> </div> <div style="margin-bottom: 10px;"> <p><input checked="" type="checkbox"/> Outcomes</p> <p><input checked="" type="checkbox"/> Outcome ID <input checked="" type="checkbox"/> Assessment Date <input checked="" type="checkbox"/> Relationship/Knowledge Scale/Meetins Needs</p> </div> <div style="margin-bottom: 10px;"> <p><input type="button" value="Search"/> <input type="button" value="Reset"/> Export To Excel</p> </div> <p style="color: #6aa84f; font-size: small;">(▶) <u>Denotes required fields</u></p>
	<ul style="list-style-type: none"> Export to Excel. Delete the following columns: <ul style="list-style-type: none"> Local System ID Intake ID Discharge Ref ID Format the date columns (MM/DD/YYYY) Freeze the top row. Sort by Discharge Destination For children with more than 2 rows, delete the rows for any interim assessments so that only entry and discharge ratings remain. Add a column before discharge destination and put "Days" in the top row. In the second row insert a formula that subtracts IFSP date from Discharge date (=F2-E2). Format result as a number and pull formula down to the end of the column. Custom Sort by "Days". Delete rows for all children in the system less than six months (<183 days).

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Name of Tool	Adhoc Report
Analysis/Actions	<ul style="list-style-type: none"> • Look for the following: <ul style="list-style-type: none"> ○ Are there any children who did not have either and/or entry or exit ratings? ○ Look for “N’s” in the outcomes columns (which indicate that the child had NO new skills over the time in early intervention in that outcome area). ○ Look at the three entry ratings for each child. Is there a difference of 3 or more across outcomes? ○ Look at the three exit ratings for each child. Is there a difference of 3 or more across the three outcomes? ○ Look at the difference between entry and exit ratings for each child for each outcome. Do any differ by 3 or more points? ○ Look at the entry and exit ratings across children. Are there any patterns evident such as all children start with low ratings and all children leave with high ratings across all three outcomes (rather than seeing variation)? ○ Look for ratings of 7 across all three outcomes at entry. • Next steps: <ul style="list-style-type: none"> ○ Review records of individual children where unusual patterns were seen to see if there is a reason for the rating, for the absence of ratings, for N, etc. Unusual patterns may reflect the reality – or may reflect data quality issues. ○ If patterns are seen across all children or children with specific providers or service coordinators, follow up to determine if additional training/guidance is needed.

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Name of Tool	Child Progress Data Verification (Child Progress)
Location of Report	ITOTS Reports - OSEP Data Verification and Monitoring
Purposes of Report	<p>To identify</p> <ul style="list-style-type: none"> • whether child ratings were entered for children who had IFSPs during the user specified time frame • whether exit ratings were entered for children who exited during the user specified time frame <p>To look at ratings for pattern checking (for data quality) including comparison of ratings across outcomes, comparison of entry to exit ratings and comparison of entry ratings and exit ratings across children</p>
Report Specifications	<p>The report will list all child assessment ratings for each child who had any child outcome assessment during the user specified time frame in the local system selected for reporting. All ratings that have been done for each child will be reported, including ratings that were done by other local systems (for children who have been seen in more than one local system).</p> <ul style="list-style-type: none"> • Children are listed in order of ITOTS number • Assessments/ratings are numbered (entry assessment = 1; Interim or exit assessment, if not interim assessments = 2, etc.) • Number of days in the system is listed • Progress categories are listed for children with more than one assessment/ rating • If the child had more than one assessment/rating, the final OSEP Progress categories are determined based on a comparison of the entry ratings to the exit ratings. <p>Note: Child's name is one field (first name last name); service coordinator last name doesn't populate the pdf report</p>
Instructions	<ul style="list-style-type: none"> • Select the begin and end date for the report • Select "view report" (pdf) or "export to excel". <p>Note: Due to the layout of the excel report, it is not possible to effectively sort the excel report and keep a child's information together.</p>
Analysis/Actions	<p>Review report to determine if:</p> <ul style="list-style-type: none"> • all children who had an initial IFSP are listed on the report with initial assessment data and ratings <ul style="list-style-type: none"> ○ Run the Initial IFSP Dates Within the Time Period (OSEP Verification/ Monitoring Report) for the same time period; ○ Export data to excel ○ Sort by ITOTS numbers ○ Compare the children listed on each report to see if all children with an IFSP during the time frame are on the Child Progress Data Verification Report and have entry data. (Note, children who are 30 months or older at the time of the Initial IFSP are not required to have entry data) • all children who were discharged from Virginia's EI system and who were in the system at least 6 months had an exit assessment and ratings <ul style="list-style-type: none"> ○ Run the Children Discharged (OSEP Verification/Monitoring Report) for the same time period. ○ Export data to excel ○ Sort by ITOTS numbers ○ Compare the children listed on each report to see if all children discharged are on the Child Progress Data Verification Report and have exit data. • Review report to look for any unusual patterns: <ul style="list-style-type: none"> ○ For individual children, look at distribution of scores across all three outcomes at entry

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Name of Tool	Child Progress Data Verification (Child Progress)
Location of Report	ITOTS Reports - OSEP Data Verification and Monitoring
	<p>(do the same analysis for exit ratings):</p> <ul style="list-style-type: none"> ▪ Are all three outcomes are the same? ▪ Do all three outcomes have ratings of 7? ▪ Is the difference between child outcome ratings greater than 3? <ul style="list-style-type: none"> ○ For individual children, compare entry to exit ratings: <ul style="list-style-type: none"> ▪ Is the difference between entry and exit rating greater than 3? ○ Looking at the report as a whole: <ul style="list-style-type: none"> ▪ Are there patterns that appear to indicate that all children are rated low at entry and high at exit? ▪ Are there more than a few with a 1 at exit rating (which indicates that the child did not demonstrate ANY new skills)? ▪ Are there any patterns across specific outcomes that indicate that none or very few of the children either very high or very low scores? (That is, do most of the children have the same general rating on either entry or exit for any of the three child outcomes)? <p>NOTE: Unusual patterns do not necessarily mean that the data is inaccurate. Next steps include:</p> <ul style="list-style-type: none"> • Review of individual child records to determine whether the ratings make sense • Consideration of population served that may help explain the unusual patterns

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Name of Tool	Child Progress Report (Entry to Exit Comparison)
Location of Report	ITOTS Reports - OSEP Data Verification and Monitoring
Purpose of Report	<p>To provide (for children who were eligible during the time range and have both entry and exit data):</p> <ul style="list-style-type: none"> • counts and percentages of children whose ratings fell in each of the OSEP progress categories for each OSEP outcome, and • percent of children who substantially increased their rate of growth from entry to exit in each outcome area, and • percent of children who exited at age level for each OSEP outcome.
Report Specifications	<ul style="list-style-type: none"> • There must be ≥ 6 months between the initial assessment and the exit assessment for children to be included in this report.
Instructions	<ul style="list-style-type: none"> • Select the begin and end date for the report • Select “view report” (pdf) or “export to excel”.
Analysis/Actions	<p>Child Outcome Results:</p> <ul style="list-style-type: none"> • Compare the % of children who meet the state target for Summary Statement 1 and Summary Statement 2 to the following: <ul style="list-style-type: none"> ○ The state target ○ Prior year local data ○ State results <p>The meaningful differences calculators can be used to determine whether any of the differences are significant.</p> • Look at the number and % of responses in each progress category. <ul style="list-style-type: none"> ○ Are there any unexpected patterns? For local systems with low numbers, use of the meaningful differences calculator for progress categories is necessary to determine if any differences between the local system results and expected patterns are significant. ○ If there are significant differences, the Ad Hoc report or the Child Progress Data Verification Report can be used to identify the progress categories for specific children.

Name of Tool	Child Progress Analysis Report
Location of Report	ITOTS Reports – Child Progress
Purpose of Report	<ul style="list-style-type: none"> • To provide the following information for all children who exited early intervention during the user specified time frame: <ul style="list-style-type: none"> ○ Name, ITOTS number, IFSP date, Exit date, initial assessment date, final assessment date, days between IFSP and Exit date; days between initial and final assessment date, initial outcome ratings, final outcome ratings including progress question, progress categories (from entry to exit assessment), transition destination, reason for missing data, name of service coordinator. • To provide the following aggregate information for the local system: <ul style="list-style-type: none"> ○ Number of children who exited

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	<ul style="list-style-type: none"> ○ Number of children expected to have exit data (children who have 183 days or more between IFSP date and exit date) ○ % of children expected to have exit data (which is the % of children who were in the system 6 months or longer) ○ Number of children with exit data ○ Number of children with exit data at least 6 months after initial assessment (for reporting to OSEP) ○ % of children with at least 6 months from IFSP to discharge who have exit data
Report Specifications	<ul style="list-style-type: none"> ● Children who transition to another local system are not included in this report
Instructions	<ul style="list-style-type: none"> ● Select the begin and end date for the report ● Select “view report” (pdf) or “export to excel”.
Analysis/Actions	<ul style="list-style-type: none"> ● The main purpose of this report is to track the percent of children for whom there is exit data and to identify which children are missing data. ● Since each child is listed along with their initial and final ratings, the report can also be used for pattern checking. ● The report can also be used to see what percentage of children is staying in the system 6 months or longer. ● Additional analyses will be identified as we all begin to use this report.

Name of Tool	Local System Child and Family Outcomes Profile
Location	Provided by ITCVA Technical Assistance Consultant/Monitor
Purpose	Provide a snapshot overview of the local system’s status in terms of child and family outcomes and child count; provide a mechanism to look at progress over time (trends) for analysis and improvement planning
Instructions	Excel template to be completed by Local System using data available through ITOTS (Child count, child outcomes [including percent of exiters with exit data and OSEP progress category patterns]) and from communications from the State Part C Office (family outcomes including response rates; meaningful differences calculators for populating data)

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Name of Tool	Meaningful Differences Calculator
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Understanding Meaningful Differences (DaSy Nov. 2015)

What is the meaningful differences calculator?

One way to understand Annual Performance Report (APR) indicator data, including outcomes data, is to compare state data from year to year and to compare local program data to state data in a particular year. ECO developed this Meaningful Differences Calculator to allow states and others to easily determine differences in data that they want to compare. This product is an Excel-based calculator that uses a statistical formula to determine if two percentages (i.e., family outcomes) should be considered different from each other. The user enters the numerator and denominator for the state family outcomes from the two most recent years and the calculator computes the statistical significance of the difference between these two family outcomes and highlights significant differences. The calculator also compares the family outcomes for each local program to the state value. In addition to indicating statistically significant differences, the calculator computes a confidence interval around all estimates.

How could you use the meaningful differences calculator?

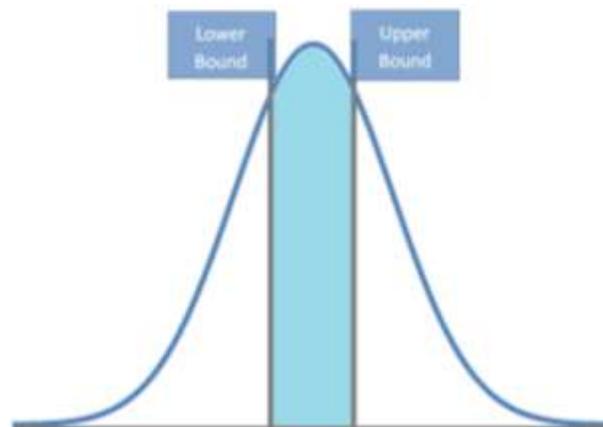
- 1) To compare the state's current year family outcomes values (or other indicator results) to the previous year's results.
- 2) To compare local programs' family outcomes values (or other indicator results) to the state results or state target for the current year.

How do you know if there is a meaningful difference?

The meaningful difference calculator uses an accepted formula (test of proportional difference) to determine whether the difference between the two percentages is statistically significant (or meaningful), based upon the 90% confidence intervals for each indicator (significance level = .10). Differences that are statistically significant are marked as "Yes".

What is a confidence interval?

A confidence interval is a range of values that describes the uncertainty surrounding a value or indicator. A confidence interval is indicated by its endpoints, the upper and lower bounds. For example, the 90% confidence interval for the percentage of families report that early intervention services helped their child develop and learn for State A is 78.53 to 81.47%. The lower bound is 78.53% and the upper bound is 81.47%. Another way to say it is that the 90% confidence interval is +/- 1.47 percentage points of the family outcome.



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How do you interpret a confidence interval?

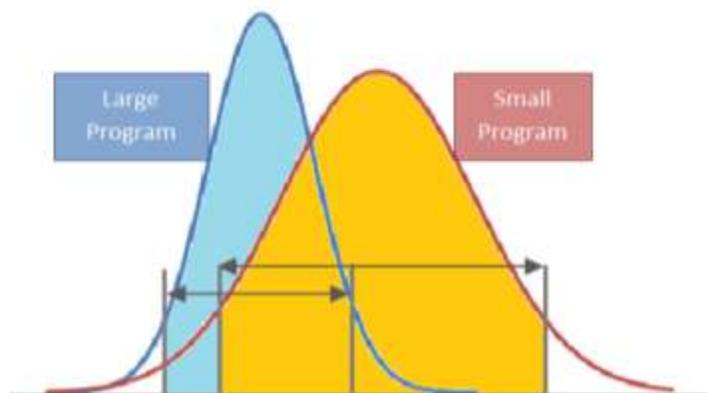
The “90%” in the confidence interval above represents a level of certainty about our estimate or indicator. If we were to repeatedly gather new estimates of the percentage of families who reported that EI helped their child develop and learn using the same procedure, the confidence intervals would contain the estimate 90% of the time. The 90% confidence interval for the family outcome: help their child develop and learn for State A is 78.53 to 81.47%, or +/- 1.47%. For the same estimate, the 95% confidence interval is wider: 78.25 to 81.75%, or +/- 1.75%. The meaningful differences calculator computes a 90% confidence interval.

How do you interpret confidence intervals?

Confidence intervals are a way to represent how “good” an estimate is; the larger the 90% confidence interval for the state or a local program, the more caution is required when using the estimate or indicator. It is difficult to interpret family outcomes with confidence intervals that are more than +/- 5 percentage points. Confidence intervals are an important reminder of the limitations of the estimates and also allow us to draw conclusions about the meaningfulness of differences when we compare two estimates, such as from one year to the next or from a local program to the state.

How do confidence intervals relate to the number of families?

The size of the confidence interval depends upon the sample size. For instance, a small local program will have less precision in their family outcome percentage and therefore will need a wider confidence interval in order to capture all the estimates 90% of the time. A larger local program will typically have more precision in their family outcome percentage and will typically have a more narrow confidence interval. For instance, a large program with 200 families (represented in blue) will have a narrower confidence interval than a small program with only 30 families (represented in yellow; see figure below). If both programs have the same help their child develop and learn percentage of 80%, the small program with 30 families would have a 90% confidence interval of +/- 11.77% while the large program with 200 families would have a narrower confidence interval of +/- 4.64%.



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Meaningful Differences Calculators – Key Points

Meaningful differences calculators are used to determine whether local systems' results are statistically different from the state targets for Indicators 4 (Family Outcomes), 5 and 6 (child count) and for evaluating whether there is statistically different % of responses in the Child Outcomes progress categories.

- Systems that don't meet targets with raw numbers (their actual result), may meet the target when the meaningful differences calculator is used.
- The meaningful differences calculators are doing this because there is normal, random variation with any measurement; using the calculators provides a more valid picture of the results by taking that normal, random variation into account.
- When we use the calculators, it takes into account the normal variation that occurs and creates a 90% confidence interval around the actual result. There's 90% chance that the true result (if normal, random variation were eliminated) falls somewhere between the upper and lower bounds of the confidence interval. Another way to think about it is this ... there's no meaningful difference between the actual local result and any of the values that fall within the confidence interval.
 - When the state compares local results to the state target using the meaningful differences calculator, the upper and/or lower bound of the confidence interval are compared to the target instead of comparing the actual local result to the target. You get credit that your local result could have been as high as the upper bound or as low as the lower bound. That's why using the calculator can only benefit the local system, never hurt.
 - As long as the upper bound of the confidence interval is at or over the target, the local system would "meet the target" for family outcomes and child count.
 - If the upper bound of the confidence is below the target, then the local result would be meaningfully different and the local system would not "meet the target" for family outcomes and child count.
 - For targets that are a range (e.g. % of responses in each child outcome progress category):
 - If the upper bound of the confidence interval is below the bottom number of a range (e.g. less than 5% for the expected range of 5-65%) or the lower bound of the confidence interval is above the top number of the range (e.g. more than 65% for the expected range of 5-65%), then the local results are meaningfully different and do not meet the target. Otherwise, the results are not considered "anomalies" and the local system meets the target.

Meaningful Differences Calculators - Additional Explanatory Information

- Measurement errors nearly always exists – i.e., "normal variation"
- Meaningful differences calculators (MDC) provide a more accurate picture of local system results
 - Program size impacts measurement
 - Using raw data for determinations and/or performance planning can yield inaccurate conclusions
 - Use of the MDC reduces the likelihood of attributing a change (good or "bad") to something that was or was not done in/by the local system when in reality it was simply due to normal data variation

Toolkit for Analysis of Child and Family Outcome Data

0-1 Child Count Percentage of Population (Target =1.2%)				
Local N 2013-2014	Local Value 2013-2014	Lower Bound of the Confidence Interval	Upper Bound of the Confidence Interval	Meaningfully lower than 1.2%?
216	2.31%	1.13%	4.68%	No
3232	1.24%	0.96%	1.60%	No
616	1.62%	0.97%	2.70%	No
2094	0.38%	0.22%	0.68%	Yes
15926	1.27%	1.14%	1.43%	No
376	2.13%	1.20%	3.74%	No
4646	0.88%	0.68%	1.14%	Yes
875	1.83%	1.22%	2.74%	No
5062	1.03%	0.82%	1.29%	No
1121	1.16%	0.74%	1.82%	No
1678	1.13%	0.78%	1.64%	No
3629	1.16%	0.90%	1.49%	No
1522	0.39%	0.20%	0.76%	Yes
7755	0.99%	0.82%	1.20%	Yes
6204	1.13%	0.93%	1.37%	No

In the example above, note:

- Larger ranges between lower and upper bound of confidence interval for systems with low n
- As long as the upper bound of the confidence interval is equal to or above the target (1.2), the local system value is not meaningfully different

Consider:

- Any value (future measurements) that is within the upper and lower bound of the confidence interval for the local system results will reflect random variation and cannot be attributed to be a result of changes in the local system.

Formula for Lower Bound of the Confidence Interval for 0-1 Child Count:

$$=(2*C6*D6+1.645*1.645-1.645*SQRT(1.645*1.645+4*C6*D6*(1-D6)))/(2*(C6+1.645*1.645))$$

Formula for Upper Bound of the Confidence Interval for 0-1 Child Count:

$$=(2*C6*D6+1.645*1.645+1.645*SQRT(1.645*1.645+4*C6*D6*(1-D6)))/(2*(C6+1.645*1.645))$$

MEANINGFUL DIFFERENCES CALCULATORS are available from your TA/Monitor for:

- Expected patterns for OSEP Child Outcomes Progress Categories
- Child Outcomes
- Family Outcomes
- Child Count

EXCEL SPREADSHEETS for Child and Family Outcome Profiles and Child Count Trends will be provided by your TA/Monitor.