

Validation of the Key Indicator Methodology: Two Examples

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Introduction

The purpose of this paper is to address the validation of the key indicator methodology as suggested in the *ASPE White Paper on ECE Monitoring* (2015). It was so accurately pointed out in this *White Paper* regarding the need to continue to access and validate differential monitoring which generally consists of the key indicator and risk assessment methods.

Over the past 35 years various aspects of differential monitoring have been assessed and validated. For example, studies by Kontos and Fiene (1987) and Fiene (2000) demonstrated the relationship between key indicators and child development outcomes. In 2002, another *ASPE White Paper on the Thirteen Indicators of Quality Child Care: A Research Update* summarized the research over the previous 20 years in demonstrating a core set of key indicator risk assessment standards. More recently, a study completed in Georgia (Fiene, 2014) validated the use of core rules in a risk assessment and differential monitoring approach. And in 2012, a study was done in California which demonstrated the time savings in using a key indicator approach. And finally, in 2013-14, a study was done in the national Head Start program in which their key indicator approach (Head Start Key Indicators (HSKI)) validated the decision making ability of key indicators in which an 84% - 91% agreement was found between the HSKI and Full Compliance Reviews. The focus of this paper will be on the latest findings from Head Start since these findings have not been published to date.

The National Child Care Licensing Study (2011) and the National Center for Child Care Quality Improvement (2014) have reported the significant use of differential monitoring, key indicators and risk assessment methods by many states throughout the country. And with the reauthorization of CCDBG (2014) and the increased emphasis on ECE program monitoring there is an increased need to validate these approaches. This paper is the beginning attempt to begin this process focusing on the key indicator method.

Methodology

This validation method is based upon existing Key Indicator Systems in which data can be drawn from an already present data base which contains the comprehensive instrument (total compliance data) and the key indicator instrument (key indicator rule data). When this is in place and it can be determined how licensing decisions are made: full compliance with all rules or substantial compliance with all rules to receive a license, then the following matrix can be used to begin the analyses (see Figure 1):

Figure 1	<i>Providers who fail the Key Indicator review</i>	<i>Providers who pass the Key Indicator review</i>	<i>Row Totals</i>
<i>Providers who fail the Comprehensive review</i>	W	X	
<i>Providers who pass the Comprehensive Review</i>	Y	Z	
<i>Column Totals</i>			<i>Grand Total</i>

A couple of annotations regarding Figure 1.

W + Z = the number of agreements in which the provider passed the Key Indicator review and also passed the Comprehensive review.

X = the number of providers who passed the Key Indicator review but failed the Comprehensive review. This is something that should not happen, but there is always the possibility this could occur because the Key Indicator Methodology is based on statistical methods and probabilities. We will call these False Negatives (FN).

Y = the number of providers who failed the Key Indicator review but passed the Comprehensive review. Again, this can happen but is not as much of a concern as with “**X**”. We will call these False Positives (FP).

Figure 2 provides an example with actual data from a national organization that utilizes a Key Indicator System. It is taken from 50 of its program providers.

Figure 2	<i>Providers who fail the Key Indicator review</i>	<i>Providers who pass the Key Indicator review</i>	<i>Row Total</i>
<i>Providers who fail the Comprehensive review</i>	25	1	26
<i>Providers who pass the Comprehensive Review</i>	7	17	24
<i>Column Total</i>	32	18	50

To determine the agreement ratio, we use the following formula:

$$\frac{A}{A + D}$$

Where **A = Agreements** and **D = Disagreements**.

Based upon Figure 2, A + D = 42 which is the number of agreements; while the number of disagreements is represented by B = 1 and C = 7 for a total of 8 disagreements. Putting the numbers into the above formula:

$$\frac{42}{42 + 8}$$

Or

.84 = Agreement Ratio

The False Positives (FP) ratio is .14 and the False Negatives (FN) ratio is .02. Once we have all the ratios we can use the ranges in Figure 3 to determine if we can validate the Key Indicator System. The FP ratio is not used in Figure 3 but is part of the Agreement Ratio.

Figure 3 – Thresholds for Validating the Fiene Key Indicators for Licensing Rules

<u>Agreement Ratio Range</u>	<u>False Negative Range</u>	<u>Decision</u>
(1.00) – (.90)	.05+	Validated
(.89) – (.85)	.10 - .06	Borderline
(.84) – (.00)	.11 or more	Not Validated

Results

The following results are from a study completed in 2014 using Head Start data where HSKI reviews were compared with comprehensive reviews to make certain that additional non-compliance was not found when HSKI tools were administered to programs.

There was an 84% - 91% (see Table 1) agreement between the HSKI and Comprehensive Reviews which would indicate that the HSKI method was validated in Head Start based upon Figure 3 above in the Methodology section.

FY 2015 HSKI Agreement Table 1

FY 2015 HSKI Agreement Tables with Combined OHSMS Data from FYs 2012, 2013, and 2014

	% agreement	Sensitivity
FIS	91%	63%
GOV/SYS	84%	63%
SR	87%	52%

Fiscal (5)

- FIS1.1 - Effective financial management systems (D, I, T)
- FIS2.1 - Timely and complete financial records (D)
- FIS4.1 - Signed and approved time records (T)
- FIS5.3 - NFS contributions are necessary and reasonable (D)
- FIS6.2 - Complete and accurate equipment records (D, T)

SR (9)

- CDE1.2 - System to track, use, and report on SR goals (I)
- CDE2.1 - Evidenced-based curriculum (I)
- CDE3.1 – Individualizing (I)
- CDE3.4 - Child access to mental health services (I)
- CDE4.1 - Teacher qualifications (S)
- CHS1.5 - Health services tracking system (I)
- CHS2.2 - Referrals for children with disabilities to LEA or Part C Agency
- FCE2.3 - Access to mental health services (I)
- FCE5.3 - Coordination with LEAs and Part C Agencies

GOV/SYS (9)

- GOV2.1 - Training and Technical Assistance for GB and PC (I)
- GOV2.2 - GB responsibilities regarding program administration and operations (I)
- GOV3.1 - Reporting to GB and PC (I)
- GOV2.4 - PC submits program activity decisions to GB (I)
- SYS1.2 - Annual Self-Assessment (I)

- SYS4.1 - Communication mechanisms (I)
- SYS5.2 - Publication and availability of an Annual Report (I)
- SYS2.1 - Ongoing Monitoring (I)
- SYS5.1 - Record-keeping (I)

I = Interview

D = Document Review

T = Transaction Review

S = Staff files

Discussion

This paper presents a validation methodology to validate the differential monitoring approach that utilizes key indicators. This is an area that needs additional research as many more states began to think about employing the various approaches for differential monitoring involving risk assessment and key indicators.

The results from this paper are very encouraging in that they clearly demonstrate that a very large delivery system, the national Head Start program, can utilize key indicators (HSKI – Head Start Key Indicators) for a differential monitoring approach (Aligned Monitoring System).

For additional information regarding this paper:

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Appendix

A more recent validation study has been completed in the Province of Ontario, Canada where they compared three sets of Key Indicators over three calendar years in a similar fashion to the Head Start study reported above. Below are the results of these analyses.

Validation Summary

Year	Key Indicators	Agreement Ratio
2014	29 Indicators	0.90
	35 Indicators	0.92
	41 Indicators	0.94
2013	29 Indicators	0.90
	35 Indicators	0.92
	41 Indicators	0.93
2012	29 Indicators	0.91
	35 Indicators	0.93
	41 Indicators	0.94

Note. The key indicators are validated when the agreement ratio is 0.90 or above.