

Technical Detail Notes: Validation Updates to the Fiene Key Indicator Systems

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These notes will provide guidance on validating existing Key Indicator Licensing Systems. These notes are based upon the last three years of research and data analysis in determining the best means for conducting these validation studies.

These notes are 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

$$.84 = \text{Agreement Ratio}$$

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

RESOURCES AND NOTES

For those readers who are interested in finding out more about the Key Indicator Methodology and the more recent technical updates as applied in this paper in actual state examples, please see the following publication:

Fiene (2014). *ECPQIM4©: Early Childhood Program Quality Indicator Model4*, Middletown: PA; Research Institute for Key Indicators LLC (RIKI). (<http://drfiene.wordpress.com/riki-reports-dmlma-ecpqim4/>)

In this book of readings/presentations are examples and information about differential monitoring, risk assessment, key indicators, validation, measurement, statistical dichotomization of data, and regulatory paradigms. This publication delineates the research projects, studies, presentations, & reports completed during 2013-14 in which these updates are drawn from.

For those readers interested in a historical perspective to the development of the Key Indicator methodology and licensing measurement, please see the following publications (most of these publications are available at the following website (<http://rikinstitute.wikispaces.com/home>):

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