Regulatory Compliance Decision Making Using the Key Indicator Methodology

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The purpose of this paper is to provide guidance to regulatory administrators in decision making regarding the Key Indicator Methodology. A 2 x 2 Matrix will be used to demonstrate the key decisions that need to be made with various caveats and examples. Key Indicator Systems for Licensing have been used in states for many years now; this paper hopefully will provide a framework for the difficult decision making when it comes to moving from an abbreviated monitoring inspection to a full comprehensive monitoring inspection.

The basic *KIS Decision Making 2 x 2 Matrix* to be employed throughout this paper is the following format:

KIS Decision Making Matrix	**Overall Low Compliance (L)**	**Overall High Compliance (H)**
KI Rule is Not In-Compliance (NC)	L+NC = Desirable	H+NC = False Negative
KI Rule is In-Compliance (C)	L+C = False Positive	H+C = Desirable

The above 2 x 2 Matrix provides the basic decision making in a licensing key indicator system. We want to find a rule that statistically predicts overall high compliance when it is in-compliance (H+C) and when it is not in-compliance it predicts overall low compliance with all rules (L+NC). Less favorable are rules that are in- compliance but predict overall low compliance (L+C) and worse of all is when the rule is not in-compliance but statistically predicts high overall compliance with all rules (H+NC). In the KIS Decision Making Matrix we should always find (L+NC) + (H+C) > (H+NC) + (L+C). (H+NC) should be zero (0) or as close to zero. Both (L+NC) and (H+C) should be the highest populated cells in the matrix. Generally because of the nature of rules, (L+C) is usually well populated as well which is not necessarily a bad thing but it can lead to inefficiencies which will help to defeat the purpose of the Key Indicator Methodology's cost efficiency.

Examples of the above may help to make this more straightforward for decision making:

Example 1:

KIS Decision Making Matrix	**Overall Low Compliance**	**Overall High Compliance**
KI Rule is Not In-Compliance	1	0
KI Rule is In-Compliance	59	44

Example 1 demonstrates a non-significant relationship within the KIS Decision Making Matrix where there is no relationship between this particular rule and its ability to predict overall regulatory compliance. It would not be recommended as a Key Indicator Rule.

Example 2:

KIS Decision Making Matrix	**Overall Low Compliance**	**Overall High Compliance**
KI Rule is Not In-Compliance	5	0
KI Rule is In-Compliance	55	44

In Example 2, this rule reaches significance (phi = .19; $p < .05$) in being able to predict overall compliance because now when the rule is not In-Compliance it predicts overall low compliance, and continues when the rule is In-Compliance to predict overall high compliance. However, there are still a number of False Positives (n = 55) where when the Rule is In-Compliance it is predicting overall low compliance. This can lead to monitoring additional programs that don't necessarily need additional in-depth monitoring which goes counter to the purposed of the Key Indicator Methodology. But this is a fact of life with licensing data, most programs are in compliance with the majority of their rules.

Example 3:

KIS Decision Making Matrix	**Overall Low Compliance**	**Overall High Compliance**
KI Rule is Not In-Compliance	21	3
KI Rule is In-Compliance	39	41

Example 3 provides an interesting dilemma in that it is more highly significant (phi = .33; $p < .001$) than Example 2, but introduces three 3 False Negatives where the program is in the High Compliance Group but the specific Rule is Not In-Compliance.

Example 4:

KIS Decision Making Matrix	**Overall Low Compliance**	**Overall High Compliance**
KI Rule is Not In-Compliance	60	0
KI Rule is In-Compliance	0	44

Example 4 provides a perfect relationship (phi = 1.00; $p < .0001$) between the KI rule and the overall compliance level. The KI rule is always not In-Compliance with the overall low compliance programs and always In-Compliance with the overall high compliance programs. The problem is this KI rule just does not exist in the licensing field. It does in the program quality (QRIS) arena utilizing ERS data but not in licensing and regulatory administration.

So where does this leave the regulatory licensing administrator in making decisions with the Key Indicator Methodology. When should one move from an abbreviated monitoring inspection to a full monitoring inspection? When should a rule become a key indicator? The answer depends on the tolerance for false negatives I feel. Any licensing administrator must be concerned when the false negatives are beginning to populate the matrix.

The purpose of this paper is to help regulatory licensing administrators decide when to use Key Indicators/Abbreviated Inspections and when to use Comprehensive Monitoring Inspections. In the past, phi coefficients were used as the determining factor without regard for False Negatives. Based on the past 40 years of research into Key indicators' Methodology, I think a closer look at the Matrix data is warranted rather than a strict threshold determination using phi coefficients.

Based upon this need to look more closely at the False Positives and Negatives, it is highly recommended to use a top 25% and a bottom 25% for the High and Low Compliance Groups rather than a 50%/50% separation. The 25%/25% breakout is a much better model. And lastly, once the Key Indicators (KI) are in place, run a correlation and scatterplot of the KI with the Comprehensive Instrument (CI) to see how the data display. A very high correlation (r = .75+) should be observed in the comparison of KI and CI. This is the last step in order to validate the use of the KI as an efficient and effective abbreviated instrument that statistically predicts overall compliance via the Comprehensive Instrument (CI).

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