# Early Childhood Program Quality Indicator and Improvement Model (ECPQIM) and Differential Monitoring Logic Model and Algorithm (DMLMA) Readings

Richard Fiene, Ph.D.

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# Introduction

This research monograph provides research reports, papers, and technical notes supporting the Early Childhood Program Quality Indicator and Improvement Model (ECPQIM) and the Differential Monitoring Logic Model and Algorithm (DMLMA). The ECPQIM/DMLMA is now in its fourth edition and has been used in many contexts to improve regulatory compliance and quality in human service programs. The first edition appeared in 1985 and the most recent edition has been updated in 2013. Please see the References/Publications which has all the citations to these publications.

This monograph is organized into an initial introduction reading which provide or overview and framework for ECPQIM/DMLMA. This is followed by national examples of the use of the methodologies. State example reports are listed after the national examples. Some of the state examples provide the actual reports along with blueprint reports for developing the methodologies and examples from both child care and children's services. After this section, quality examples are listed with Colorado's QRIS and several reports of the Early Childhood Education Linkage System's Infant Toddler Quality Improvement Project.

This is followed by a validation design and examples of validation studies conducted utilizing the ECPQIM/DMLMA model, in particular the Key Indicator methodology. Several papers follow that provide opinions and results from the ECPQIM model. This is followed by a couple of technical research notes. It is all wrapped up with some very short concluding comments.

**Richard Fiene, Ph.D.**
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# DIFFERENTIAL MONITORING LOGIC MODEL (DMLM©): A NEW EARLY CHILDHOOD PROGRAM QUALITY INDICATOR MODEL (ECPQIM$^4$©) FOR EARLY CARE AND EDUCATION REGULATORY AGENCIES

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# DIFFERENTIAL MONITORING LOGIC MODEL (DMLM©): A NEW EARLY CHILDHOOD PROGRAM QUALITY INDICATOR MODEL (ECPQIM$^4$©) FOR EARLY CARE AND EDUCATION REGULATORY AGENCIES


## ABSTRACT

A new Early Childhood Program Quality Indicator Model (ECCPQIM$^4$©) is described which utilizes targeted program monitoring (Differential Monitoring) via two licensing methodologies: Key Indicators and Risk Assessments. The theoretical and conceptual framework as well as a logic model are presented along with a scoring protocol that can be utilized to compare state/province and national organizations on how they are designing and implementing their program monitoring systems. A state/province/national framework/plan is presented as well as results from five (5) states (Georgia, Kansas, Illinois, Colorado, and New York) and a national organization (Office of Head Start). The five states and national organization are then compared using the Differential Monitoring Scoring Protocol (DMSP©). The Head Start program monitoring system scored a perfect 10 out of 10 in utilizing the DMSP©. Suggestions are made in how the scoring protocol could be used for making comparisons internationally and for future research in comparing various approaches.


***Key Words: Program Monitoring, Differential Monitoring, Program Quality, Licensing.***

***Background***

This paper will introduce a Differential Monitoring Logic Model (DMLM©) which provides a new Early Childhood Program Quality Indicator Model (ECPQIM$^4$©) in which the major monitoring systems in early care and education are integrated conceptually so that the overall early care and education system can be assessed and validated. With this new model, it is now possible to compare results obtained from licensing systems, quality rating and improvement systems (QRIS), risk assessment systems, key indicator systems, technical assistance, and child development/early learning outcome systems (see Figures 1 & 2 for a graphical depiction of the theoretical underpinnings and actual design & logic model for the ECPQIM$^4$©/DMLM).

The DMLM© can be used by early care and education state/province agencies, Federal agencies, and large provider organizations where an economy of scale is required. This model can be used with state as well as national standards, such as state licensing rules/regulations and *Caring for Our Children (AAP, 2012).* Most states and Federal agencies have either some or all of the key elements of this model in their overall monitoring systems. The purpose of this model is to alter a one-size fits all monitoring system to one that is targeted, spending more time with problem programs who need additional assistance. This is a cost neutral model that is both cost effective and efficient and re-allocates resources from the compliant programs to the non-compliant programs. Presently there is not a measurement rubric for making comparisons within the USA or internationally when it comes to measuring the effectiveness and efficiency of child care and early care program monitoring systems. This can become a very important tool as the USA begins implementation of the re-authorization of the Child Care and Development Block Grant.

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**Insert Figure 1**

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The ECPQIM$^4$©/DMLM© is based very heavily in translational research and implementation science as a means of building an ongoing program monitoring system based upon the latest empirical demonstrations in the early care and education research literature. It is at the intersection of child care public policy, early care and education interventions, and empirical research. The ECPQIM$^4$©/DMLM© along with the scoring protocol introduced in this paper could provide a framework for making comparisons amongst states/provinces, national organizations, and countries in how they have designed and implemented their respective program monitoring of child care and early care & education systems similar to how Child Care Aware has developed a reporting format for the USA in comparing states on regulatory and oversight functions. The author reported on such a comparison in a previous study in an earlier edition of this journal (Fiene, 2013). The DMLM© framework and scoring protocol could provide a similar measurement tool for assessing child care and early childhood education program monitoring systems.

**DMLM© Key Elements** (see Figure 2): **CI** = state or federal child care standards, usually rules or regulations that measure health and safety - *Caring for Our Children* (AAP, 2012) will be applicable here. **PQ** = Quality Rating and Improvement Systems (QRIS) standards at the state level; process quality measures. **RA** = risk assessment tools/systems in which only the most critical rules/standards are measured. *Stepping Stones* (NRC, 2013) is an example of this approach**.** **KI** = key indicators in which only predictor rules/standards are measured. The *Thirteen Indicators of Quality Child Care* (Fiene, 2002) is an example of this approach. **DM** = differential monitoring decision making in which it is determined if a program is in compliance or not and the number of visits/the number of rules/standards are ascertained from a scoring protocol**.** **PD** = technical assistance/training and/or professional development system which provides targeted assistance to the program based upon the **DM** results. **CO** = child outcomes which assesses how well the children are developing which is the ultimate goal of the system.

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**Insert Figure 2**

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Once the above key elements are in place, it is then possible to look at the relationships (this is depicted by the arrows that go from one box to another) amongst them to determine if the system is operating as it was intended; in other words, to determine if the DM system is improving the health, safety, program quality and ultimately the overall development of the children it serves.

In the Methodology section, a scoring protocol (DMSP© - Differential Monitoring Scoring Protocol©) is introduced which attempts to quantify these relationships and to give us a means for making measurements and comparisons across various types of organizations.

The DMLM© provides a cross-cutting methodology that can be used in all child care/early care and education delivery systems as well as in other human services. In the past many of these monitoring systems have functioned in silos. The DMLM© integrates all these various monitoring systems together so that the overall monitoring system can be validated as being cost effective and efficient. This can be an important development as available funds become more scarce in the future as international organizations deal with fewer and fewer resources.

***Methods***

**National/State/Provincial Agency Plan for implementing a Differential Monitoring System:**

The **first step** in utilizing the DMLM© for a state/province/nation is to take a close look at its Comprehensive Licensing Tool (CI) that it uses to collect violation data on all rules with all facilities in its respective state/province/nation. If the state/province/nation does not utilize a tool or checklist or does not review all violation data than it needs to consider these changes because the DMLM© is based upon an Instrument Based Program Monitoring System (IPM)(Fiene & Nixon,1985) which utilizes tools/checklists to collect data on all rules.

The **second step** for the state/province/nation is to compare their nation's/state's/province's rules with the National *Health and Safety Performance Standards (Caring for Our Children*)(AAP, 2012) or an equivalent international set of standards to determine the overlap and coverage between the two.

The **third step** for the state/province/nation if it utilizes a Risk Assessment (RA) tool is to assess the relationship between this tool and *Stepping Stones* (NRC, 2013) or an equivalent international set of targeted standards to determine the overlap and coverage between the two.

The **fourth step** for the state/province/nation is to compare the results from the CI with the RA tools.

In the **fifth step**, if a state/province/nation is fortunate enough to have a QRIS – Quality Rating and Improvement System in place and has sufficient program quality (PQ) data available then they will have the ability to compare results from their CI tool with their PQ tool and validate outputs by determining the relationship between compliance with health and safety rules (CI) and program quality (PQ) measures that measure process quality. This is a very important step because very few empirical demonstrations appear in the research literature regarding this relationship.

The **sixth step** is for the state/province/nation to generate a Key Indicator (KI) tool from the CI data base. Please see Fiene & Nixon (1985) and Fiene & Kroh (2000) for a detailed explanation of the methodology for generating a KI tool. If a state/province/nation did not want to use the KI methodology, a direct comparison could be drawn from The *Thirteen Indicators of Quality Child Care* (Fiene, 2002).

The **seventh step** for the state/nation is to use the RA and KI tools together to determine overall compliance of facilities and how often and which rules will be monitored for future visits. This is the basic component of a Differential Monitoring (DM) approach. Also, this step should drive decisions within the technical assistance/training/professional development (PD) system in what resources are allocated to a particular facility.

The **eighth and final step** for the state/nation is to compare the results from the various monitoring tools (CI, PQ, RA, KI) with any child development outcome (CO) data they collect. This is a relatively new area and few, if any, states/provinces/nations at this point have this capability on a large scale. However, as Early Learning Networks/Systems and Standards (ELS) are developed, this will become more common place.

The ECPQIM4©DMLM© is presented without two additional items that were present in the 2012/2013 versions which are important to note. The algorithm (Fiene, 2012, 1013) and validation framework (Zellman & Fiene, 2012) are not presented because the author felt that these two components took away from a more direct presentation of differential monitoring. For those interested readers, please refer to my previous abstracts (Fiene, 2012, 2013) which included the algorithm and validation frameworks.

Just another brief word about the Theoretical Underpinnings for ECPQIM$^4$. This graphic (Figure 1) attempts to provide the relationships amongst public policy, interventions, and empirical evidence through the lens of translational research, implementation science, and program monitoring. In constructing the ECPQIM$^4$ concepts were borrowed from each area and integrated them in a model for monitoring early care and education programs. The graphic provides a means for displaying the relationships and potential intersections as well as the content that is important to each scientific/research field.

Figure 3 is provided as additional information regarding differential monitoring conceptually without all the details as in figure 2; and figure 4 is provided to demonstrate the impact that a state's/provincial/national licensing law can have on using the Key Indicators and Risk Assessment methodologies.

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**Insert Figures 3 & 4**

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Also, taking Figure 2 and attempting to quantify these relationships, a scoring protocol is proposed as depicted in Table 1. This can provide a numerical means of comparing various differential monitoring systems and their relative comprehensiveness. This protocol could be a useful tool in future research for determining which combinations work best.

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**Insert Table 1**

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The next section provides the results from a national organization and five states who used the above methodology to implement their respective differential monitoring systems.

***Results and Discussion***

The Early Childhood Program Quality Indicator Model (ECPQIM©) and its latest iteration presented as a logic model: Differential Monitoring Logic Model (DMLM©) have been written about extensively by this author (Fiene & Nixon, 1985; Griffin & Fiene, 1996; Fiene & Kroh, 2000; Fiene, 2013). Several states and Head Start have used the model in order to re-align their program monitoring systems. This paper presents the results of those new program monitoring systems through the lenses of the ECPQIM©/DMLM© logic model display. Each particular approach used various components of the overall comprehensive national model and have been highlighted by connecting arrows. It is proposed that this approach could be applied at an international level as well.

The interested reader should obtain a copy of the Office of Child Care's *Licensing Brief on Differential Monitoring, Risk Assessment, and Key Indicators* published by the National Center on Child Care Quality Improvements which gives additional details regarding these approaches and methodologies as well as other state examples. Please go to the following URL website: (https://childcareta.acf.hhs.gov/sites/default/files/1408_differential_monitoring_final_1.pdf). In fact, this paper builds upon that excellent *Licensing Brief*.

Let's start with Figure 5 which provides the Comprehensive National Example that depicts all the possible interconnections and gives national examples from the research literature. As one will see, it is possible for a national organization or a state/provincial agency to select the various components from the model based upon what is available in their particular organization. All do have the program compliance/licensing component (PC) but not all have fully functional program quality initiatives (PQ) or do not have the data to draw from the program quality initiatives.

The next level of components are the key indicator (KI) and risk assessment (RA) approaches or methodologies which organizations or state agencies can use alone or in tandem. One limitation in the key indicator methodology is not to use it with program initiatives if the data are not severely skewed in their data distribution as is the case with licensing data.

The last component is the resulting differential monitoring (DM) approach based upon the results from using the key indicator and risk assessment methodologies either alone or in tandem. This is the ultimate revision of the program monitoring system in which how often and what is reviewed are answered.

All the components are highlighted (this is indicated by the arrows going from one box to another) in Figure 5 because all are possibilities to be used by a national or state agency. The examples in Figure 5 are drawn from the national research literature so *Caring for Our Children* (AAP, 2012) is the example for Program Compliance, Licensing, and the Health & Safety Comprehensive Instrument (CI). The following examples in Figures 6-11 will show some differences in how national and state agencies have developed their respective differential monitoring systems through their use of key indicator (KI) and risk assessment (RA) methodologies, and linking their licensing/program compliance (PC) and program quality (PQ) initiatives. Tables 1-3 explain the scoring protocol and provide results from the national Head Start program and five states geographically dispersed around the USA (New York, Georgia, Illinois, Kansas, and Colorado). Also see the end of the paper for an explanation of Notes a,b,c in Figure 5.

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**Insert Figure 5**

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Figure 6 provides an example from New York (NY) where the state agency is attempting to restructure their early care and education program monitoring system to have a better balance between licensing and key program quality indicators. The plan is to have licensing staff collect data from both areas which means a need to save time in the licensing reviews via key indicators and to only identify indicators of quality through a risk assessment approach. The results from these two methodologies will then be combined into a Quality Indicators Instrument to be used by licensing staff in their annual reviews.

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**Insert Figure 6**

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Figure 7 provides an example from Georgia (GA) in which the driving methodology is a risk assessment core rule review system that results in a differential monitoring system called the Annual Compliance Determination Worksheet (ACDW) approach. Key indicators are not used directly but were used as part of the risk assessment core rule development. Please note how the relationship amongst the various components is different from the NY approach delineated in Figure 6. There is a link to their program quality initiatives which proved very significant in the validation studies performed on their Core Rule differential monitoring system.

**Insert Figure 7**

Figure 8 presents a very different approach from the previous two approaches. In Kansas's (KS) case, the state agency was only interested in developing a key indicator approach and was not interested in risk assessment nor had the capability to tie data together from their program quality initiatives. This is noted by the arrow connections which is more minimal in this depiction. As one can see, this still is a viable option for developing a differential monitoring approach.

**Insert Figure 8**

Figure 9 depicts the use of both key indicator and risk assessment methodologies in Illinois (IL) with their licensing system but no data interaction with their program quality initiatives. It is proposed that both methodologies will be used together in future licensing reviews of programs which will constitute their differential monitoring system approach.

**Insert Figure 9**

Figure 10 depicts the new aligned differential monitoring system being employed in Head Start (HS). Head Start has a very comprehensive system that employs various aspects from all the components in their system. The Head Start Performance Standards are very comprehensive, CLASS is used as a major process quality measure and both a key indicator (Head Start Key Indicator – Compliance (HSKI-C)) and risk assessment (Selected Compliance Measures) are utilized in their program monitoring system. The Head Start new Aligned Program Monitoring system comes closest to the comprehensive national model.

**Insert Figure 10**

In Figure 11 a very different scenario played out in the state of Colorado (CO) in which key indicators were developed for their QRIS system rather than for their licensing system. As mentioned earlier, when applying the key indicator methodology to Quality Initiatives one needs to be very cautious if the data distribution is not exceptionally skewed as is the case with licensing data. Some of the data were sufficiently skewed to be able to be used in generating quality key indicators but there were limitations noted.

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**Insert Figure 11**

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The above results clearly demonstrate how agencies can take very different approaches to designing and implementing their differential monitoring system. The next research question is to determine if agencies that have higher scores (more than 6) if they are more effective and efficient than those agencies that have lower scores (less than 5).

***Conclusion***

This paper presents the latest examples of national and state agencies differential monitoring approaches. It clearly demonstrates that there are many different approaches to developing and implementing differential monitoring. A key research question for the future as more states utilize the different approaches is to study if one approach is better than the next or a combination works better than most. From 40+ years of experience as a researcher and state policy analyst I would suggest that a more comprehensive approach which employs the full menu of program quality initiatives similar to the Head Start or the New York approaches will be most effective.

As mentioned in the introduction of this paper in describing the Comprehensive National Example of the DMLM© Model Tables 1-3 present a Differential Monitoring Scoring Protocol (DMSP©) that can potentially be used to compare states on how in depth their differential monitoring system is. Table 1 describes the DMSP© in narrative terms delineating the various systems that need to be in place in order to get a particular score. A score of 0 means no systems are in place or do not intersect while a score of 10 means that all of the systems are in place and intersect or are linked. Table 2 gives the points assigned to the specific systems that are part of a differential monitoring system. And Table 3/Figure 12 give the actual points assigned to the state & national examples that have been presented in this paper for ***New York (NY), Georgia (GA), Head Start (HS), Kansas (KS), Illinois (IL), and Colorado (CO)***. The total points assigned to the comprehensive model are also provided as a point of context.

There are a couple of important things to note about the DMSP© in Table 2, such as: if Key Indicators (KI) and Risk Assessment (RA) are linked, it negates KI and RA being scored separately. If KI and RA are developed separately, it is very improbable that they will not be linked but that is always a possibility, so it is listed as so. Linking Program Compliance/Licensing (PC) and Program Quality (PQ) Initiatives is a highly desirable event and is assigned a high score (4 points). Linking KI and RA is also considered a highly desirable event and is assigned a high score (4 points).

**Insert Tables 2 & 3 and Figure 12**

For future research, it will be interesting to see if this ECPQIM$^4$©/DMLM© model has applicability from an international perspective. Some of the key elements present in USA state systems are organized very differently in other countries and would have to be adjusted. Also, it will be interesting to see if the DMSP© can be developed as a scoring systems similar to the Child Care Aware Report Card Benchmarks protocol where it will be possible to make comparisons across state and national agencies.

***Endnotes a, b, c:***

The arrows going from Key Indicators (KI) and Risk Assessment (RA) to Differential Monitoring (DM) can be configured in the following ways: only KI (Kansas); only RA (don't have an example of this as of this writing) or a combination of KI and RA (Illinois) but this configuration could mean all of the KI and RA rules which would be more rules than if only KI or RA rules were selected or only those rules that overlap (KI+RA) which would be a much reduced number of rules. Or a different configuration determined by the state agency.

***SENDING00: ECPQIM – DMLM – ICEP1d1 (2)aC RIKI HF***

***References***

AAP (2012). *National health and safety performance standards*, Evanston, IL: American Academy of Pediatrics.

Fiene (2013***).*** A Comparison of International Child Care and US Child Care Using the Child Care Aware – NACCRRA (National Association of Child Care Resource and Referral Agencies) Child Care Benchmarks, *International Journal of Child Care and Education Policy, 7(1),* 1-15.

Fiene (2012/2013). *Early childhood program quality indicator model (ECPQIM4©): Differential monitoring logic model and algorithm (DMLMA©)*, Middletown, PA: Research Institute for Key Indicators *LLC* (RIKI).

Fiene (2002). *Thirteen indicators of quality child care: Research update*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services.

Fiene & Kroh (2000). Licensing Measurement and Systems, *NARA Licensing Curriculum*. Washington, D.C.: National Association for Regulatory Administration.

Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly*, *14*(3), 198-214.

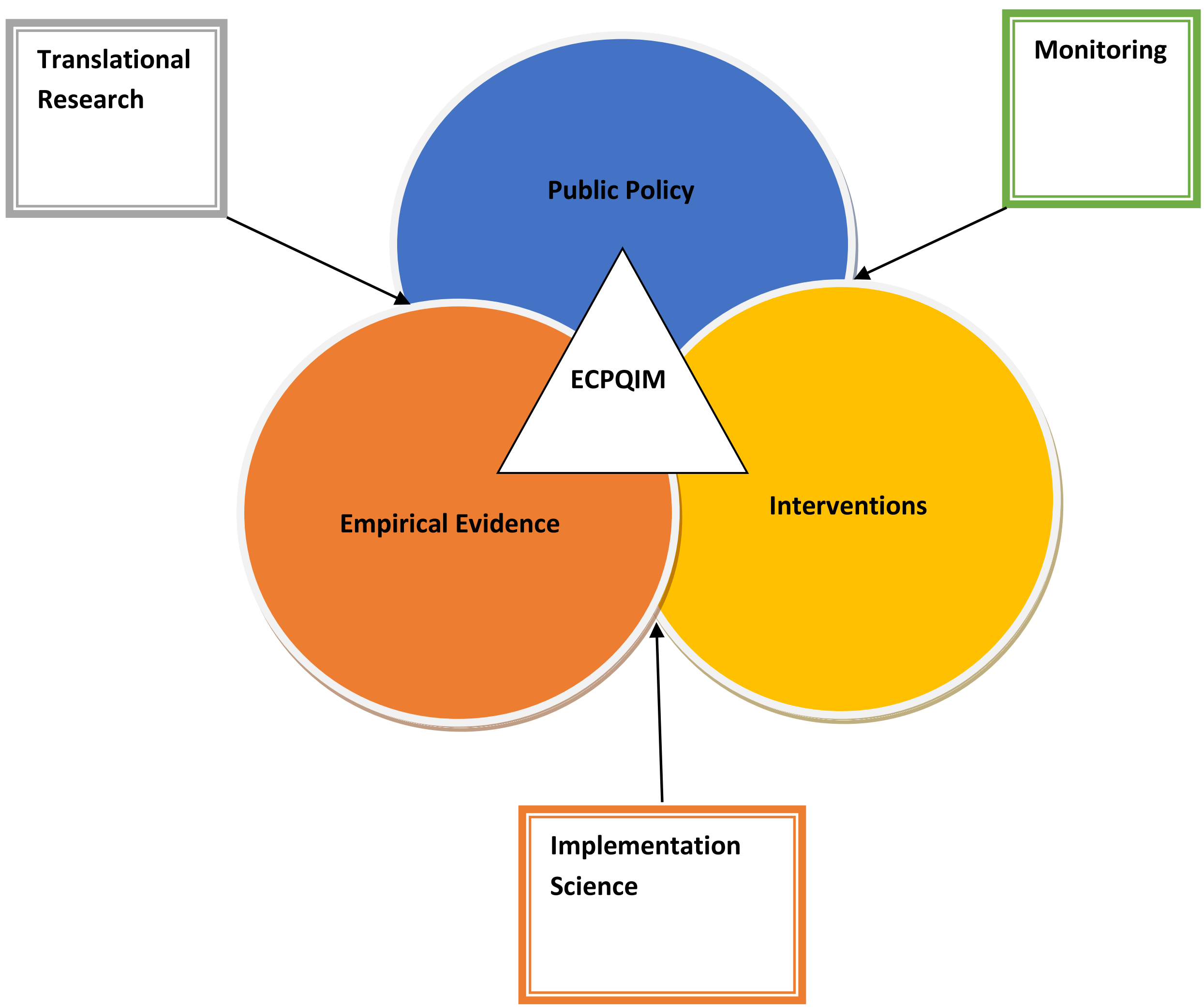
Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators*. Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.

NRC (2013). *Stepping stones to caring for our children*. Denver, Colorado: National Resource Center for Health and Safety in Child Care.

Zellman, G. L. and Fiene, R. (2012). *Validation of Quality Rating and Improvement Systems for Early Care and Education and School-Age Care,* Research-to-Policy, Research-to-Practice Brief OPRE 2012. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

**Figure 1**

**The Theoretical Underpinnings for ECPQIM4: Early Childhood Program Quality Indicator Model©**



## Figure 2

## Early Childhood Program Quality Indicator Model (ECPQIM$^{4}$©): Differential Monitoring Logic Model (DMLM©) Comprehensive National Example

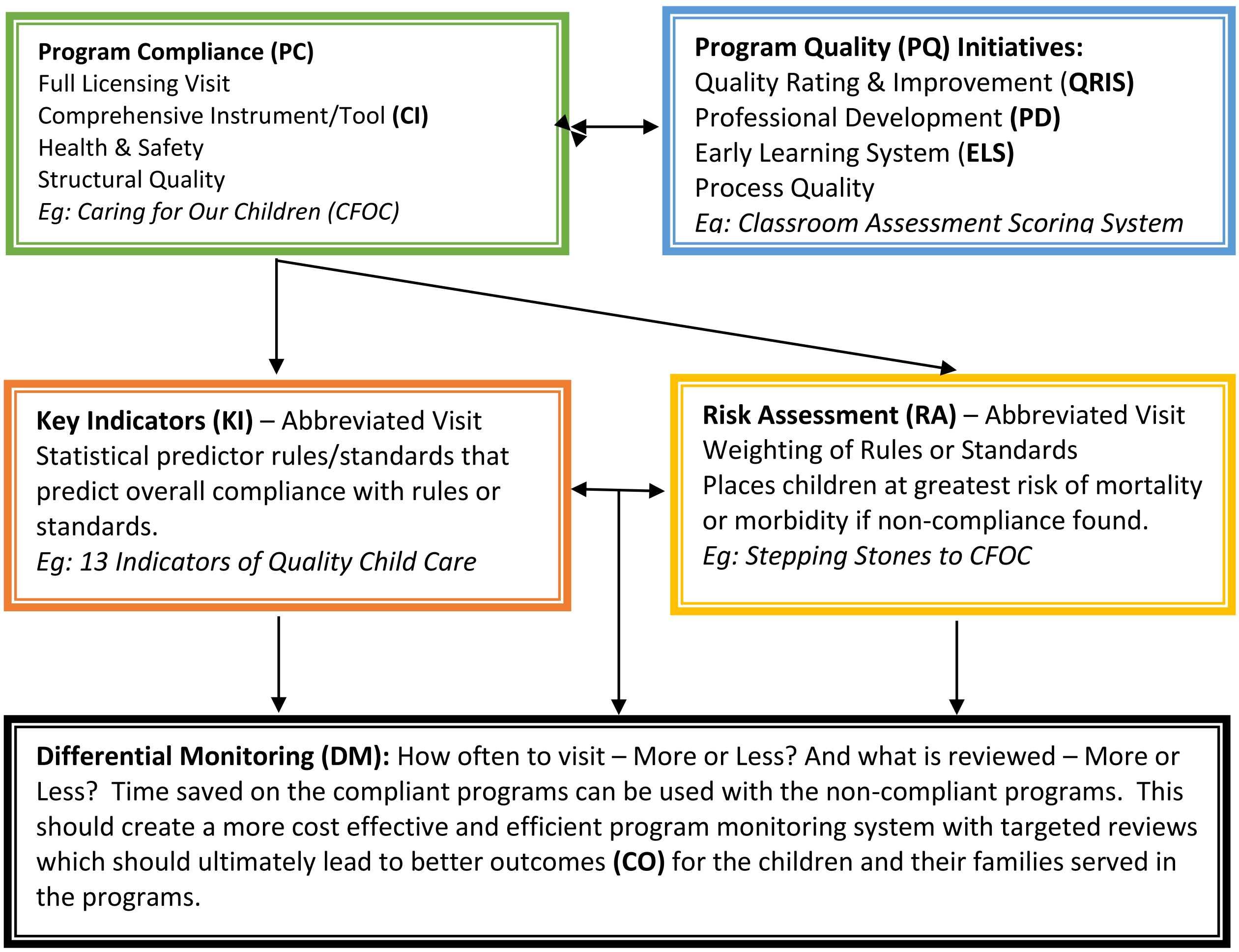
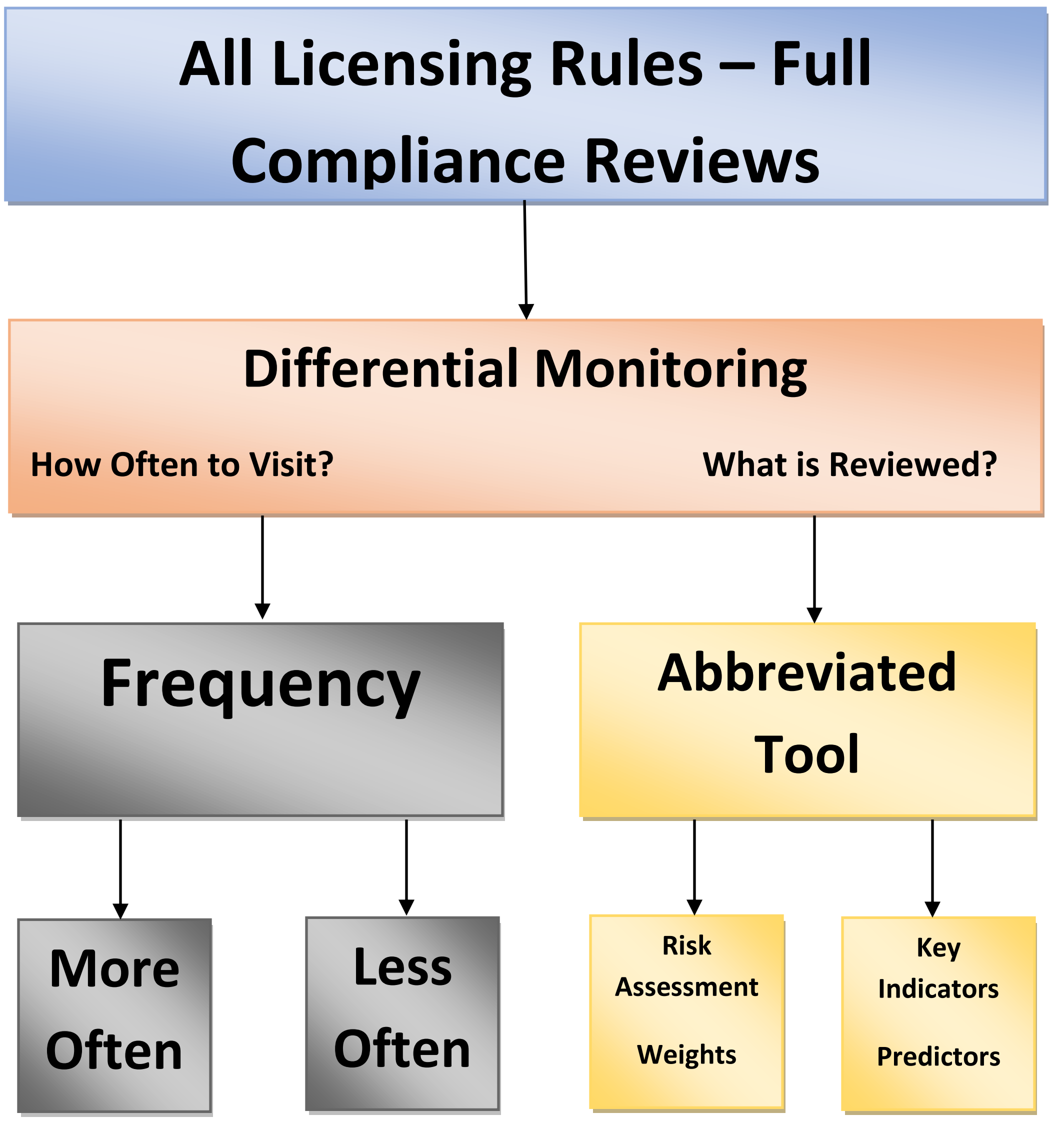


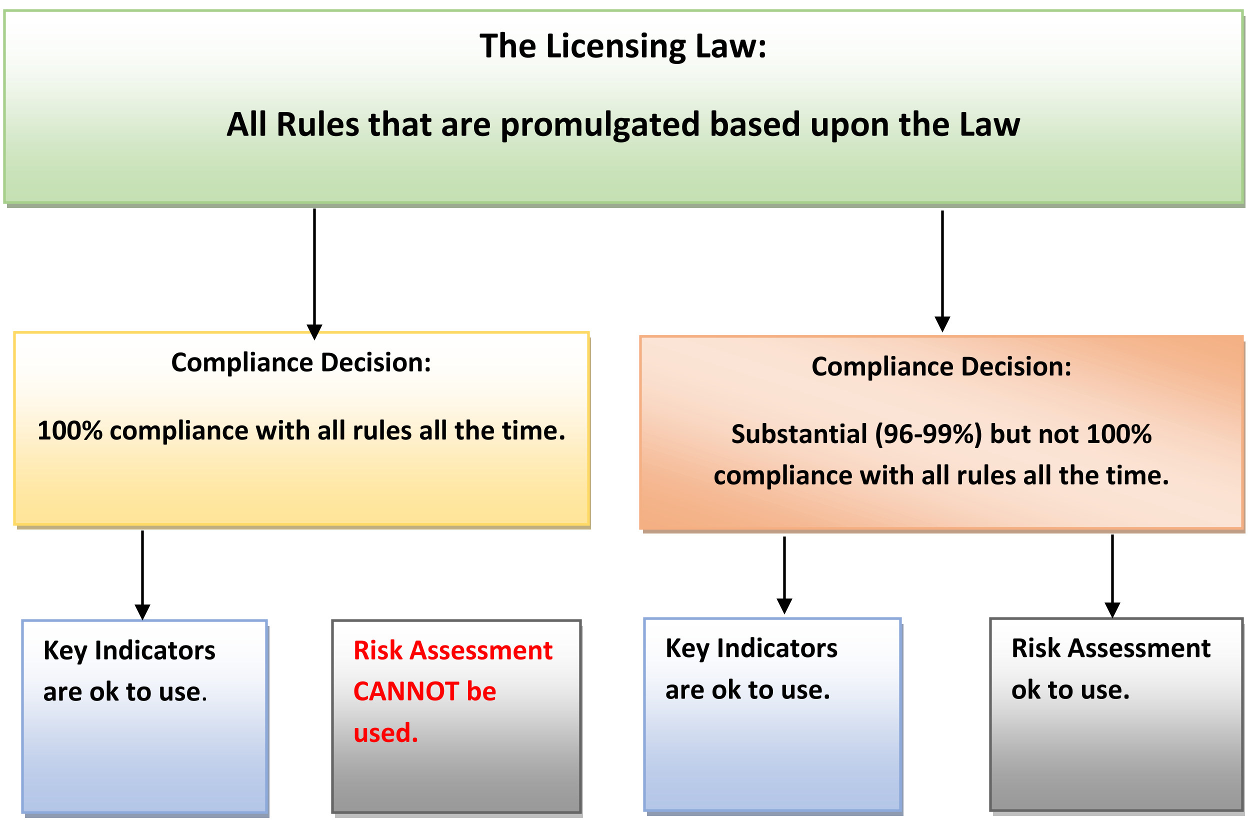
Figure 3

## Licensing Rules, Compliance Reviews, Differential Monitoring, Abbreviated Tools, Risk Assessment, and Key Indicators



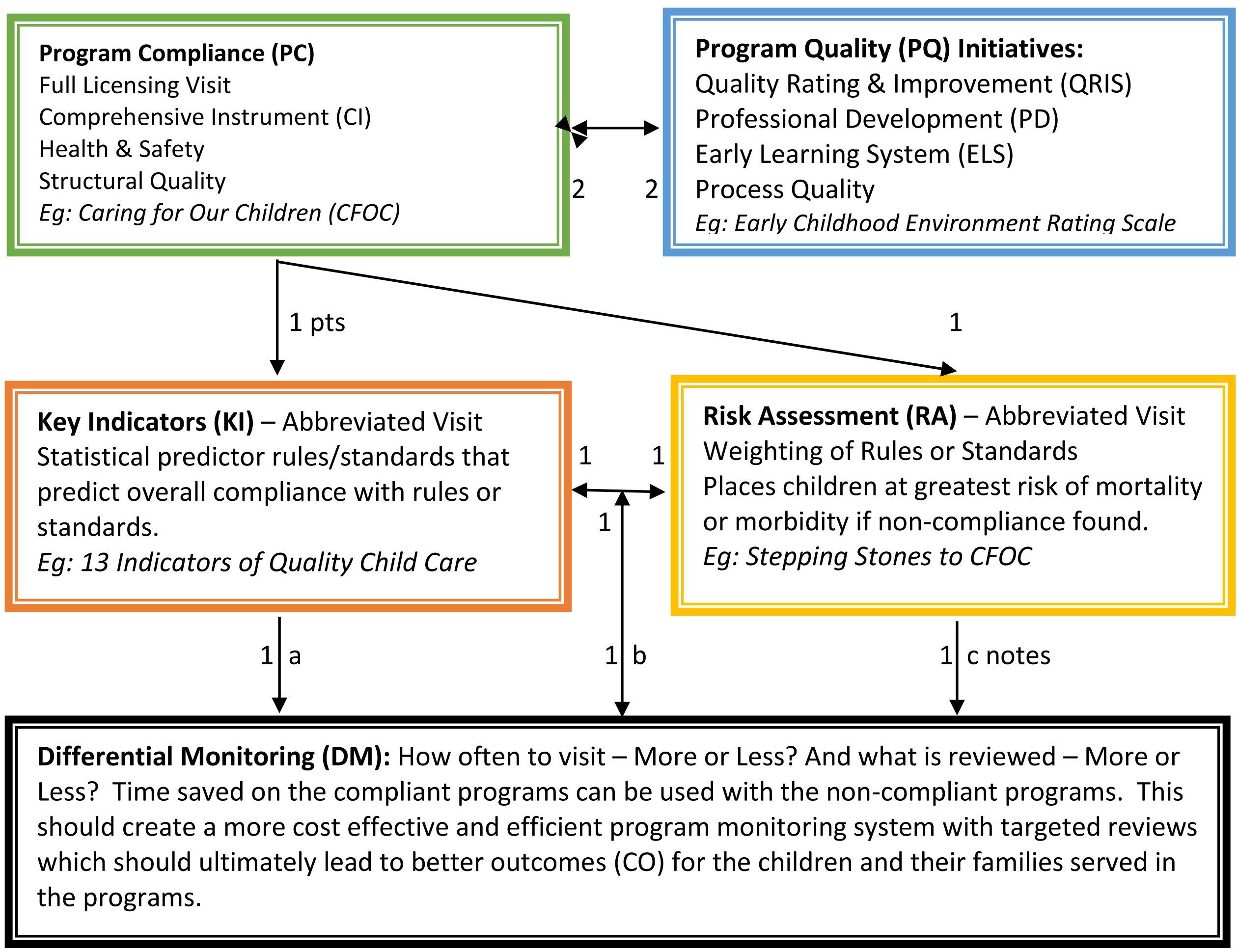
## Figure 4

## When Key Indicators and Risk Assessments Can Be Used



# Early Childhood Program Quality Indicator Model (ECPQIM4©): Differential Monitoring Logic Model (DMLM©) Comprehensive National Scoring Protocol Example (Maximum of 10 Points)

## Figure 5



# (ECPQIM4©)(DMLM©): New York Example (NY)
# Figure 6

**Program Compliance (PC)**
Full Licensing Visit
Comprehensive Instrument (CI)
Health & Safety
Structural Quality
*Eg: New York Licensing Rules*

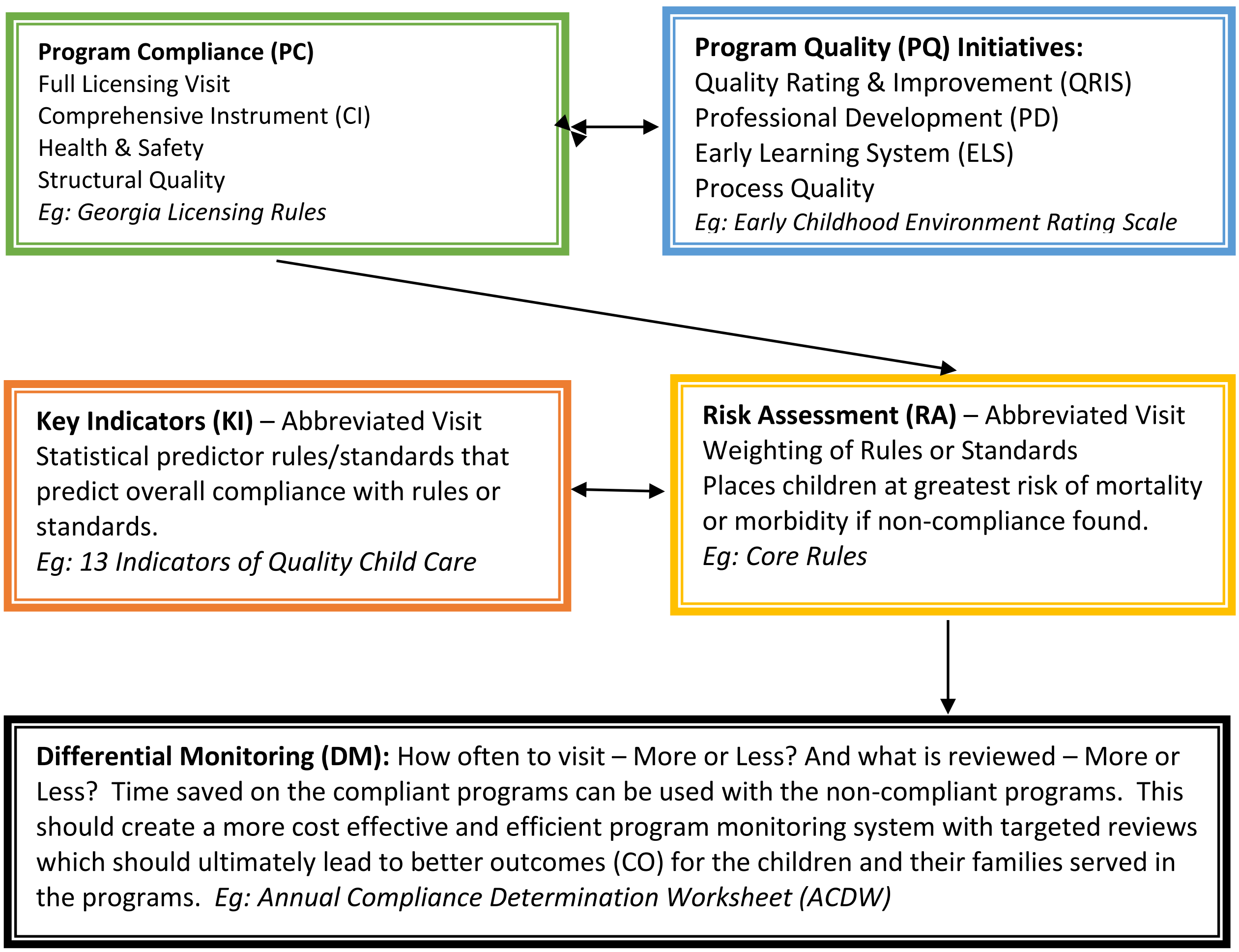
**Program Quality (PQ) Initiatives:**
Quality Rating & Improvement (QRIS)
Professional Development (PD)
Early Learning System (ELS)
Process Quality
*Eg: Early Childhood Environment Rating Scale*

**Key Indicators (KI)** – Abbreviated Visit
Statistical predictor rules/standards that predict overall compliance with rules or standards.
*Eg: New York Key Indicators*

**Risk Assessment (RA)** – Abbreviated Visit
Weighting of Rules or Standards
Places children at greatest risk of mortality or morbidity if non-compliance found.
*Eg: Selected Quality Indicators*

**Differential Monitoring (DM):** How often to visit – More or Less? And what is reviewed – More or Less? Time saved on the compliant programs can be used with the non-compliant programs. This should create a more cost effective and efficient program monitoring system with targeted reviews which should ultimately lead to better outcomes (CO) for the children and their families served in the programs.

## (ECPQIM4©)(DMLM©): Georgia Example (GA)
## Figure 7



# (ECPQIM4©)(DMLM©): Kansas Example (KS)
## Figure 8

**Program Compliance (PC)**
Full Licensing Visit
Comprehensive Instrument (CI)
Health & Safety
Structural Quality
*Eg: Kansas Licensing Rules*

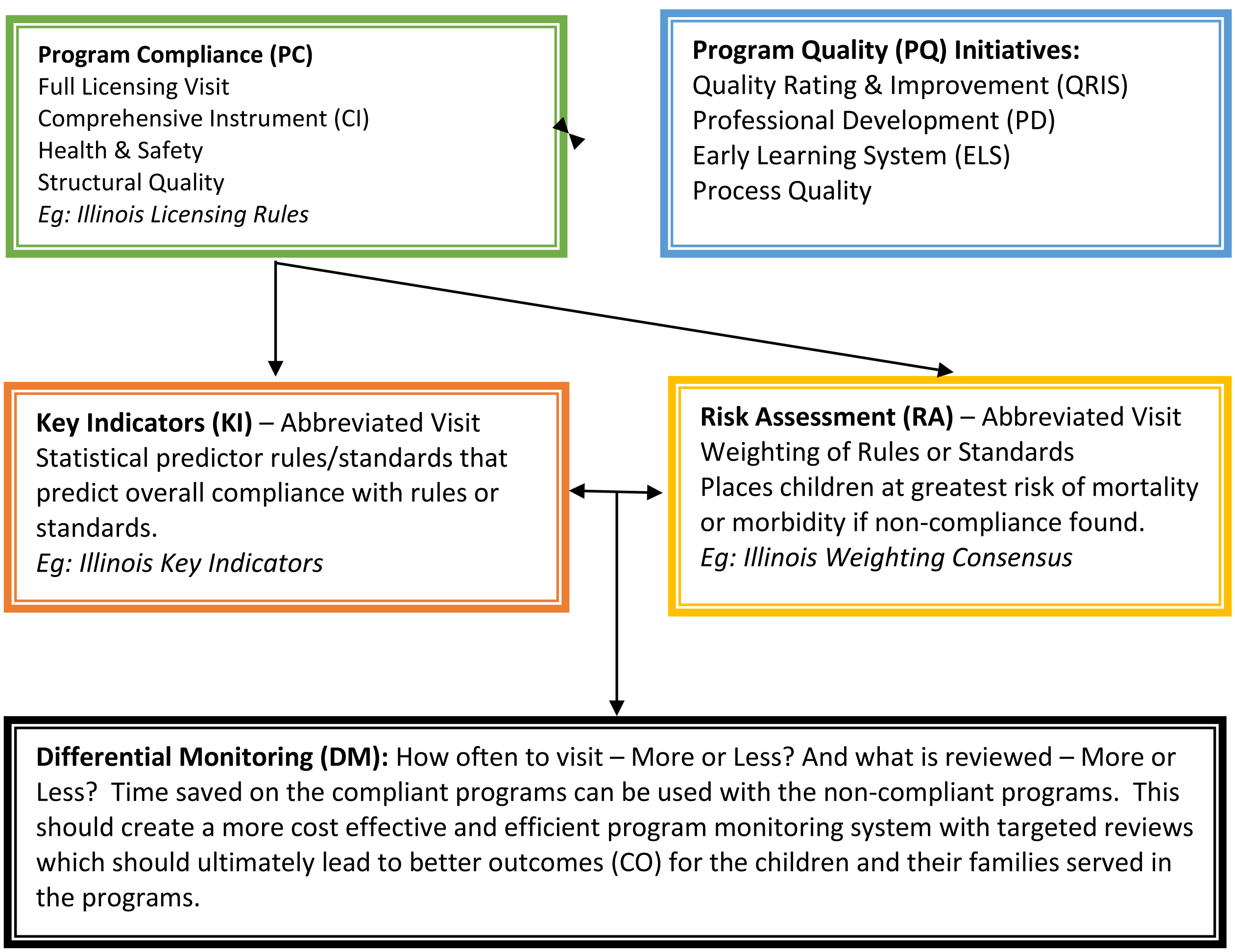
**Program Quality (PQ) Initiatives:**
Quality Rating & Improvement (QRIS)
Professional Development (PD)
Early Learning System (ELS)
Process Quality

**Key Indicators (KI)** – Abbreviated Visit
Statistical predictor rules/standards that predict overall compliance with rules or standards.
*Eg: Kansas Key Indicators*

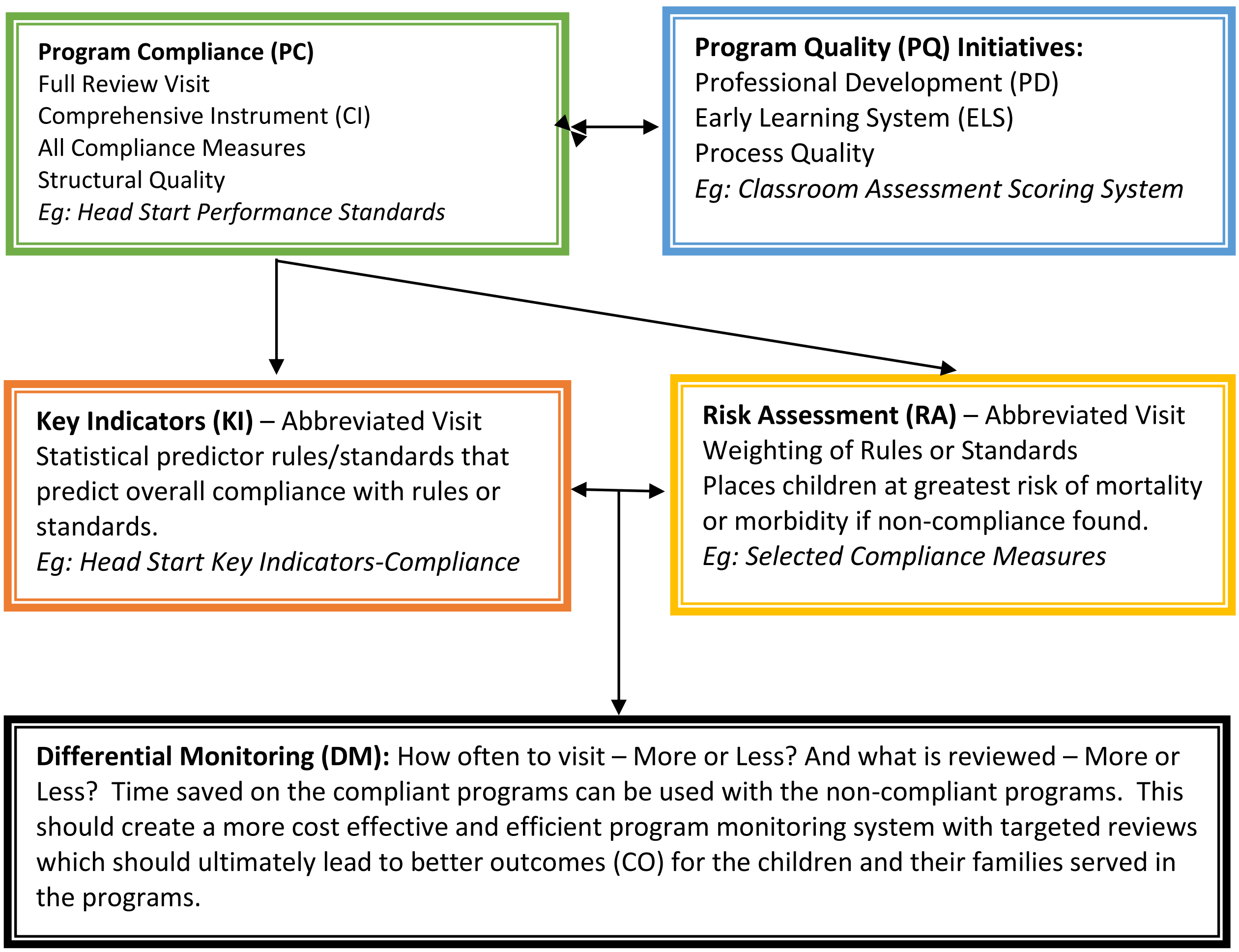
**Risk Assessment (RA)** – Abbreviated Visit
Weighting of Rules or Standards
Places children at greatest risk of mortality or morbidity if non-compliance found.

**Differential Monitoring (DM):** How often to visit – More or Less? And what is reviewed – More or Less? Time saved on the compliant programs can be used with the non-compliant programs. This should create a more cost effective and efficient program monitoring system with targeted reviews which should ultimately lead to better outcomes (CO) for the children and their families served in the programs.

## (ECPQIM4©)(DMLM©): Illinois Example (IL)
## Figure 9



# (ECPQIM4©)(DMLM©): Head Start Example (HS)
## Figure 10



# (ECPQIM4©)(DMLM©): Colorado Example (CO)
# Figure 11

**Program Compliance (PC)**
Full Licensing Visit
Comprehensive Instrument (CI)
Health & Safety
Structural Quality

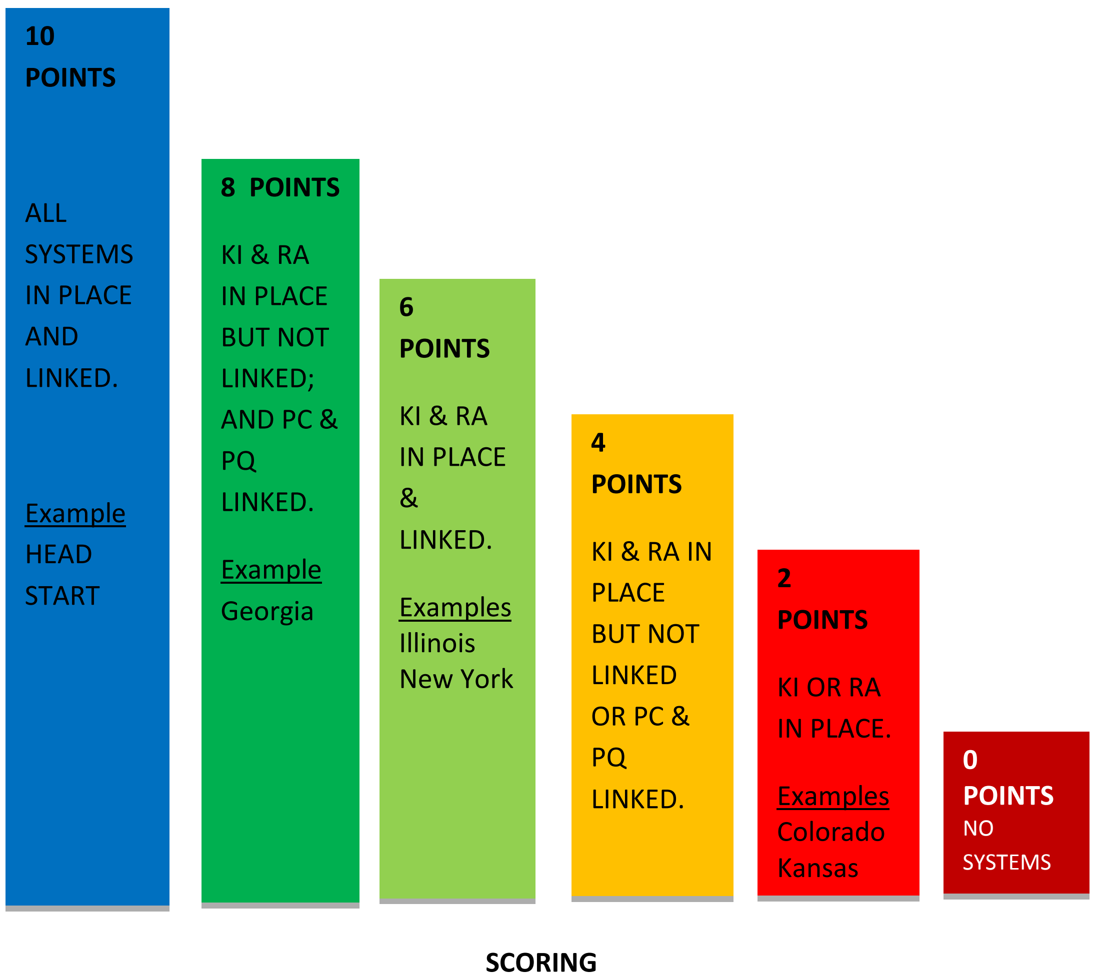
**Program Quality (PQ) Initiatives:**
Quality Rating & Improvement (QRIS)
Professional Development (PD)
Early Learning System (ELS)
Process Quality
*Eg: Early Childhood Environment Rating*

**Key Indicators (KI)** – Abbreviated Visit
Statistical predictor rules/standards that predict overall compliance with rules or standards.
*Eg: Colorado Quality Key Indicators*

**Risk Assessment (RA)** – Abbreviated Visit
Weighting of Rules or Standards
Places children at greatest risk of mortality or morbidity if non-compliance found.

**Differential Monitoring (DM):** How often to visit – More or Less? And what is reviewed – More or Less? Time saved on the compliant programs can be used with the non-compliant programs. This should create a more cost effective and efficient program monitoring system with targeted reviews which should ultimately lead to better outcomes (CO) for the children and their families served in the programs.

**DMSP© SCORING PROTOCOL WITH STATE AND NATIONAL AGENCIES AS EXAMPLES**
**Figure 12**




*KI = Key Indicators; RA = Risk Assessment; PC = Licensing; PQ = Program Quality Initiatives*

**Table 1: Differential Monitoring Scoring Protocol (DMSP)©**

| ***Score*** | ***Systems Present*** |
|---|---|
| **0** | **No systems in place.** |
| **2** | **KI or RA in place and not linked.** |
| **4** | **(KI & RA in place but not linked) or (PC + PQ are linked).** |
| **6** | **(KI & RA in place) & (KI + RA are linked)** |
| **8** | **(KI & RA in place but not linked) & ((PC + PQ) are linked).** |
| **10** | **All systems in place and linked.** |

***KI (Key Indicators); RA (Risk Assessment); PC (Program Compliance/Licensing); PQ (Program Quality Initiatives)***

**Table 2: Differential Monitoring Scoring Protocol (DMSP)© Point Assignment**

| *Score* | *Systems Present and Point Assignment* |
|---|---|
| **0** | **No systems in place.** |
| **2** | **(KI (1)) & (KI -> DM (1)) or ((RA (1)) & (RA -> DM (1))** |
| **4** | **(PC + PQ (4)) or (KI (1) & (KI -> DM (1)) & (RA (1) & (RA -> DM (1))** |
| **6** | **(KI + RA -> DM (4)) & (KI (1)) & (RA (1))** |
| **8** | **(KI (2) & RA (2)) & (PC + PQ (4)).** |
| **10** | **(KI + RA -> DM (4)) & (KI (1)) & (RA (1)) & (PC + PQ (4))** |

***KI (Key Indicators); RA (Risk Assessment); PC (Program Compliance/Licensing); PQ (Program Quality Initiatives)***

**Table 3: DMLM© SCORING PROTOCOL WITH STATE EXAMPLES**

| SYSTEMS (pts) | *MODEL* | *GA* | *NY* | *HS* | *IL* | *KS* | *CO* |
|---|---|---|---|---|---|---|---|
| *KI (1)* | *1* | - | 1 | 1 | 1 | 1 | 1 |
| *RA (1)* | *1* | 1 | 1 | 1 | 1 | - | - |
| *KI + RA -> DM (4)*<br>*KI + RA (2)* | *4* | 2 | 4 | 4 | 4 | - | - |
| *PC + PQ (4)* | *4* | 4 | - | 4 | - | - | - |
| *KI -> DM (1)* | - | - | - | - | - | 1 | 1 |
| *RA -> DM (1)* | - | 1 | - | - | - | - | - |
| *TOTAL (10)* | *10* | 8 | 6 | 10 | 6 | 2 | 2 |

*GA (Georgia); NY (New York); HS (Head Start); IL (Illinois), KS (Kansas); CO (Colorado)*

# OFFICE OF HEAD START KEY INDICATOR PROJECT REPORT

**Richard Fiene, Ph.D.**

The purpose of this report is to present to the Office of Head Start (OHS) Key Indicators of their Head Start Performance Standards (HSPS) that have the ability to statistically predict substantial compliance with all Compliance Measures and ultimately the majority of HSPS's. The analytical and methodological basis of this approach is based upon a *Differential Monitoring Logic Model and Algorithm (DMLMA©)* (Fiene, 2012) (see Appendix 3). The DMLMA© is the 4th generation of an Early Childhood Program Quality Indicator Model (ECPQIM)(Fiene & Nixon, 1985; Griffin & Fiene, 1995; Fiene & Kroh, 2000). Only a portion of the *DMLMA©* model was utilized in this report which focused on key indicators, risk assessment, and program quality.

**Definitions:**

***Risk Assessment (RA)*** - a differential monitoring approach that employs using only those rules, standards, or regulations that place children at greatest risk of mortality or morbidity if violations/citations occur with the specific rule, standard, or regulation.

***Key Indicators (KI)*** - a differential monitoring approach that employs using only those rules, standards, or regulations that statistically predict overall compliance with all the rules, standards, or regulations. In other words, if a program is 100% in compliance with the Key Indicators the program will also be in substantial to full compliance with all rules, standards, or regulations. The reverse is also true in that if a program is not 100% in compliance with the Key Indicators the program will also have other areas of non-compliance with all the rules, standards, or regulations.

***Differential Monitoring (DM)*** - this is a relatively new approach to determining the number of visits made to programs and what rules, standards, or regulations are reviewed during these visits. There are two measurement tools that drive differential monitoring, one is Weighted Risk Assessment tools and the other is Key Indicator checklists. Weighted Risk Assessments determine how often a program will be visited while Key Indicator checklists determine what rules, standards, or regulations will be reviewed in the program. Differential monitoring is a very powerful approach when Risk Assessment is combined with Key Indicators because a program is reviewed by the most critical rules, standards, or regulations and the most predictive rules, standards, or regulations. See Appendix 3 which presents a Logic Model & Algorithm for Differential Monitoring *(DMLMA©)*(Fiene, 2012).

***Program Quality (PQ) -*** for the purposes of this study this was measured via the CLASS – Classroom Assessment Scoring System. The CLASS has three sub-scales (ES = Emotional Support, CO = Classroom Organization, and IS = Instructional Support). The CLASS is a tool that is identified in the research literature as measuring classroom quality similar to the ERS tools.

**Early Childhood Program Quality Indicator Model (ECPQIM)** – these are models that employ a key indicator or dashboard approach to program monitoring. Major program monitoring systems in early care and education are integrated conceptually so that the overall early care and education system can be assessed and validated. With these models, it is possible to compare results obtained from licensing systems, quality rating and improvement systems (QRIS), risk assessment systems, key indicator systems, technical assistance, and child development/early learning outcome systems. The various approaches to validation are interposed within this model and the specific expected correlational thresholds that should be observed amongst the key elements of the model are suggested. **Key Elements** of the model are the following (see Appendix 3 for details): **CI** = state or federal standards, usually rules or regulations that measure health and safety - *Caring for Our Children or Head Start Performance* Standards will be applicable here. **PQ** = Quality Rating and Improvement Systems (QRIS) standards at the state level; *ERS (ECERS, ITERS, FDCRS), CLASS, or CDPES* (Fiene & Nixon, 1985). **RA** = risk assessment tools/systems in which only the most critical rules/standards are measured. *Stepping Stones* is an example of this approach**.** **KI** = key indicators in which only predictor rules/standards are measured. The *Thirteen Indicators of Quality Child Care* is an example of this approach. **DM** = differential monitoring decision making in which it is determined if a program is in compliance or not and the number of visits/the number of rules/standards are ascertained from a scoring protocol. **PD** = technical assistance/training and/or professional development system which provides targeted assistance to the program based upon the **DM** results. **CO** = child outcomes which assesses how well the children are developing which is the ultimate goal of the system.

**The organization of this report is as follows:**

1) **The first section** will provide an overall analysis the Head Start (HS), Early Head Start (EHS), and Head Start/Early Head Start (HS/EHS) programs[1,4];

2) **The second section** will provide analyses of the various content areas (CA) within the HSPS[4];

3) **The third section** will provide analyses of the relationship between the HSPS as measured by compliance with the Compliance Measures (CM) and the program quality scores (CLASS scores)[3];

4) **The fourth and final section** will provide the analyses that produced the key indicators (KI) and recommendations in how it could be used.[2]

The source of data for this report is all the Tri-Annual On-Site Monitoring visits for 2012 which consisted of 422 reviews of programs across the country. There were 191 Head Start (HS) only programs, 33 Early Head Start (EHS) only programs, and 198 Head Start/Early Head Start (HS/EHS) programs reviewed. This is a representative sample of Head Start and Early Head Start programs nationally representing approximately 25% of the total number of Head Start programs.

Before proceeding with the results of this study, a few clarifying and definitional terms need to be highlighted. In the *2012 edition of OHS On-Site Review Protocol* and the *2013 OHS Monitoring Protocol*, Compliance Indicators (CI) and Key Indicators (KI) are respectively mentioned. In the licensing literature, when the term “Indicators” is used it refers to standards/rules that are predictive of overall compliance with all rules/standards. However, as defined by OHS, indicators (CI/KI) are used within the context of risk assessment which means that these indicators are the standards which are most important/critical to the OHS in their monitoring reviews. These indicators therefore are not predictive in essence. That is the focus of this report/study which is to determine which of these indicators are predictive of overall compliance with all the compliance/key indicators. This is a common misconception in the human service regulatory field where risk assessment tools and key indicator tools purposes are confused. As we move forward please keep the definitions in mind related to the distinctions and functionality of risk assessment and key indicators.

For the purposes of this study, 131 Compliance Measures (CM), organized into seven (7) Content Areas (CA), were reviewed and analyzed. The seven content areas are the following: Program Governance; Management Systems; Fiscal Integrity; Eligibility, Recruitment, Selection, Enrollment, and Attendance; Child Health and Safety; Family and Community Engagement; Child Development and Education. Ten CM's were from Program Governance (GOV), 10 were from Management Systems (SYS), 22 were from Fiscal Integrity (FIS), 11 were from Eligibility, Recruitment, Selection, Enrollment, and Attendance (ERSEA), 34 were from Child Health and Safety (CHS), 16 were from Family and Community Engagement (FCE), and 28 were from Child Development and Education (CDE)[4].

**Section 1 - Head Start (HS), Early Head Start (EHS), and Head Start/Early Head Start (HS/EHS) programs**

In order to determine if analyses needed to be performed separately on Head Start (HS), Early Head Start (EHS), and Head Start/Early Head Start (HS/EHS) combined programs, the first series of analyses were performed to determine if any statistically significant differences existed amongst these three groups. This is a very important first analysis because it will help to determine the stability of the sample selected and of the overall system. In other words, is there a good deal of consistency across all service types: HS, EHS, and HS/EHS.

Based upon Table 1, no statistically significant differences were determined amongst the three groups (HS, EHS, HS/EHS) with Compliance Measures (CM) or CLASS (ES, CO, IS) Scores indicating that using the full 422 sample and not having to do separate analyses for the three groups was the correct analytical framework. However, where it is appropriate, any statistically significant differences amongst the various program types will be highlighted.

**Table 1 – Head Start, Early Head Start, & Head Start/Early Head Start With CM and CLASS/ES, CO, IS**

| Program Type | CM(N) | CLASS/ES(N) | CLASS/CO(N) | CLASS/IS(N) |
|---|---|---|---|---|
| Head Start (HS) | 3.72(191) | 5.88(186) | 5.43(186) | 2.97(186) |
| Early Head Start (EHS) | 2.67(33) | -----* | -----* | -----* |
| Head Start (HS/EHS) | 3.07(198) | 5.91(198) | 5.47(198) | 3.00(198) |
| **Totals** | **3.33(422)** | **5.89(384)** | **5.45(384)** | **2.98(384)** |
| **Statistical Significance** | **NS** | **NS** | **NS** | **NS** |

***CM = Compliance Measures (Average Number of Violations)***
***CLASS/ES = CLASS Emotional Support Average Score***
***CLASS/CO = CLASS Classroom Organization Average Score***
***CLASS/IS = CLASS Instructional Support Average Score***
***NS = Not Significant***
***N = Number of Programs***

****CLASS data were not collected in EHS.***

The average number of violations with the Compliance Measures for Head Start (3.72), Early Head Start (2.67) and Head Start/EHS (3.07) was not significant in utilizing a One-Way ANOVA. There were 191 Head Start (HS) programs, 33 Early Head Start (EHS) programs, and 198 Head Start (HS/EHS) programs.

Comparisons were also made with Head Start and Head Start/EHS on the various CLASS sub-scales (ES = Emotional Support, CO = Classroom Organization, and IS = Instructional Support) and no significant differences were found between these two groups. The EHS (n = 33) was not used because CLASS data were not collected in these programs.

The practical implication of the above results is that the same monitoring tools and the resulting Head Start Key Indicator (HSKI) to be developed as a result of this study can be used in the three main types of programs: Head Start, Early Head Start, and Head Start/EHS. There is no need to have separate tools.

**Section 2 - Content Areas**

The second series of analyses was to look more closely at the 7 content areas (CA) to measure demographically any differences amongst the various areas. In order to do this a weighted average had to be determined in order to compare the various areas because of the differences in the number of Compliance Measures (CM) used in each content area. Table 2 provides the results of these analyses. For the total sample of 422 sites, Management Systems (SYS) Content Area (CA) had the highest number of violations with the Compliance Measures (CM) with 359. The SYS/CA also had the highest average number of violations with 35.90 because there were only 10 CM. For the total sample of 422 sites, the lowest number of violations was in the Family and Community Engagement (FCE) Content Area (CA) with 48 violations with CM. It also had the lowest average number of violations with 3.00.

For the Head Start only sites (n = 191), a similar distribution as with the total sample (n = 422) is depicted in which Management Systems (SYS) Content Area (CA) had the highest number of violations with the Compliance Measures (CM) with 192. The SYS/CA also had the highest average number of violations with 19.20 because again there were only 10 CM. The lowest number of violations was in the Family and Community Engagement (FCE) Content Area (CA) with 20 violations with CM. It also had the lowest average number of violations with 1.25.

For the Early Head Start only (n = 33) and the Head Start/Early Head Start (n = 198) sites, the ranking of the various Content Areas changed somewhat with the total number of violations and the average number of violations from the Total Sample (n = 422) and the Head Start only (n = 191) sites but not dramatically. For example, the Family and Community Engagement (FCE); Child Development and Education (CDE); and the Eligibility, Recruitment, Selection, Enrollment, and Attendance (ERSEA) Content Areas switched rankings in which it had the fewest total violations and the average number of violations (see Table 2).

**Table 2 – Comparing Content Areas and Program Types**

| | Total Violations/(Rank) | | | | Average # of Violations/(Rank) | | | | CM |
|---|---|---|---|---|---|---|---|---|---|
| **Content Areas** | **TOT** | **HS** | **EHS** | **HS/EHS** | **TOT** | **HS** | **EHS** | **HS/EHS** | **#** |
| FCE | 48(1) | 20(1) | 2(1) | 26(2) | 3.00(1) | 1.25(1) | 0.125(1) | 1.63(2) | 16 |
| ERSEA | 62(2) | 37(2) | 6(3) | 19(1) | 5.64(3) | 3.36(3) | 0.545(3) | 1.73(3) | 11 |
| CDE | 91(3) | 43(3) | 5(2) | 43(3) | 3.25(2) | 1.54(2) | 0.179(2) | 1.54(1) | 28 |
| GOV | 150(4) | 94(4) | 6(3) | 50(4) | 15.00(6) | 9.40(6) | 0.600(4) | 5.00(5) | 10 |
| FIS | 255(5) | 114(5) | 23(7) | 118(5) | 11.59(5) | 5.18(5) | 1.045(6) | 5.36(6) | 22 |
| CHS | 333(6) | 151(6) | 22(6) | 160(7) | 9.79(4) | 4.44(4) | 0.647(5) | 4.71(4) | 34 |
| SYS | 359(7) | 192(7) | 20(5) | 147(6) | 35.90(7) | 19.20(7) | 2.000(7) | 14.70(7) | 10 |

***CONTENT AREAS (CA):***
***FCE = FAMILY and COMMUNITY ENGAGEMENT***
***ERSEA = ELIGIBILITY, RECRUITMENT, SELECTION, ENROLLMENT, and ATTENDANCE***
**CDE = CHILD DEVELOPMENT AND EDUCATION**
***GOV = PROGRAM GOVERNANCE***
***FIS = FISCAL INTEGRITY***
***CHS =CHILD HEALTH AND SAFETY***
***SYS = MANAGEMENT SYSTEMS***

***TOT = TOTAL NUMBER OF SITES, FULL SAMPLE OF 422 SITES***
***HS = HEAD START ONLY PROGRAMS***
***EHS = EARLY HEAD START ONLY PROGRAM***
***HS/EHS = HEAD START AND EARLY HEAD START COMBINED PROGRAMS***
***CM = NUMBER OF COMPLIANCE MEASURES***

***TOTAL VIOLATIONS = ALL THE VIOLATIONS FOR A SPECIFIC CONTENT AREA.***
***AVERAGE # OF VIOLATIONS = THE TOTAL VIOLATIONS FOR A SPECIFIC CA DIVIDED BY THE NUMBER OF COMPLIANCE MEASURES FOR THAT SPECIFIC CONTENT AREA.***
***RANK = HOW EACH CONTENT AREA COMPARES TO THE OTHER CONTENT AREAS FOR THE RESPECTIVE PROGRAM TYPE.***

For the total sample (n = 422), other CA's had different configurations between the total number of violations and the average number of violations as demonstrated by CHS – Child Health and Safety in which there was a total of 333 violations but the average number of violations was 9.79 because there were 34 Compliance Measures (CM). Program Governance (GOV) had 150 total violations and a weighted-average of 15 violations with 10 CM. Child Development and Education (CDE) had 91 total violations and a weighted-average of 3.25 violations. Fiscal Integrity (FIS) had 255 total violations and a weighted-average of 11.59 violations. And lastly, Eligibility, Recruitment, Selection, Enrollment, and Attendance (ERSEA) had 62 total violations and a weighted-average of 5.64 violations.

The Head Start only (HS = 191), Early Head Start only (EHS = 33), and the Head Start/Early Head Start (HS/EHS = 198) programs followed a similar pattern as with the total sample (n = 422). This indicates a great deal of consistency in the sample drawn. See Appendix 4 for violation data for all 131 Compliance Measures.

The practical implication of the above findings is that certain Content Areas (SYS, GOV, FIS) may need additional exploration by OHS because of their high rates of non-compliance with the Compliance Measures.

**Section 3 – Program Quality**

This section provides comparisons between the Compliance Measures (CM) data and the CLASS (ES, CO, IS) data. This is a very important section because there is always the concern that compliance with the HSPS has no relationship to program quality as measured by the CLASS. In Table 3, correlations were run between the CM data and the CLASS scores for Emotional Support (ES), Classroom Organization (CO), and Instruction Support (IS) for the Head Start only and the Head Start/Early Head Start programs. The EHS only programs were not included because CLASS data are not collected on these programs. The results are very positive and statistically significant in most cases. It is also important to note the very positive correlation between the Head Start Key Indicators (HSKI[2]) and CLASS. This result supports using the HSKI in monitoring Head Start.

**Table 3 – Relationship Between Compliance Measures (CM), KI, and CLASS (ES, CO, IS) Scores**

| | | Compliance Measures Content Areas | | | | | | | Key Indicators |
|---|---|---|---|---|---|---|---|---|---|
| **CLASS** | **CM** | ***FCE*** | ***ERSEA*** | ***CDE*** | ***GOV*** | ***FIS*** | ***CHS*** | ***SYS*** | **KI** |
| CLASS/ES | .22** | .13* | .15** | .15** | .11* | .05 | .23** | .17** | .27** |
| CLASS/CO | .19** | .13* | .11* | .16** | .04 | .06 | .21** | .15** | .25** |
| CLASS/IS | .20** | .10 | .12* | .12* | .13* | .06 | .18** | .11* | .17** |

***CM Violations = Total Compliance Measure Violations***

***CONTENT AREAS (CA):***
***FCE = FAMILY and COMMUNITY ENGAGEMENT***
***ERSEA = ELIGIBILITY, RECRUITMENT, SELECTION, ENROLLMENT, and ATTENDANCE***
**CDE = CHILD DEVELOPMENT AND EDUCATION**
***GOV = PROGRAM GOVERNANCE***
***FIS = FISCAL INTEGRITY***
***CHS =CHILD HEALTH AND SAFETY***
***SYS = MANAGEMENT SYSTEMS***

***CLASS/IS = Average CLASS IS (Instructional Support) Score***
***CLASS/ES = Average CLASS ES (Emotional Support) Score***
***CLASS/CO = Average CLASS CO (Classroom Organization) Score***

***KI = Key Indicators Total Score***

*** $p < .01$**
** $p < .05$**

***See Appendix 6 & 6A for the inter-correlations amongst all the Content Areas, HSKI, and Total Compliance with Compliance Measures.***

These results are very important but it is equally important to look more specifically at the distribution of the Compliance Measures (CM) scores and their relationship to the CLASS data (see Appendix 5 for detailed graphic distributions and Appendix 6 & 6A for the inter-correlations amongst all the CA). When this is done a very interesting trend appears (see Table 3a) in which a definite plateau occurs as the scores move from more violations or lower compliance with the Compliance Measures (25-20 to 3-8 CM Violations) to fewer violations or substantial compliance with the Compliance Measures (1-2 CM Violations) and full compliance with the Compliance Measures (Zero (0) CM Violations).

**Table 3a – Aggregate Scores Comparing CM Violations with CLASS Scores**

| CM Violations | | IS | ES | CO | Number/Percent |
|---|---|---|---|---|---|
| 0 | (Full Compliance) | 3.03 | 5.99 | 5.59 | 75/19% |
| 1-2 | (Substantial Compliance) | 3.15 | 5.93 | 5.50 | 135/35% |
| 3-8 | (Mid-Compliance) | 2.87 | 5.85 | 5.37 | 143/40% |
| 9-19 | (Lower Compliance) | 2.65 | 5.71 | 5.32 | 28/6% |
| 20-25 | (Lowest Compliance) | 2.56 | 5.52 | 4.93 | 3/1% |
| Significance | | F = 4.92; p < .001 | F = 4.918; p < .001 | F = 4.174; p < .003 | |

*CM Violations = Compliance Measure Violations (lower score = higher compliance)(higher score = lower compliance)*
*IS = Average CLASS IS (Instructional Support) Score*
*ES = Average CLASS ES (Emotional Support) Score*
*CO = Average CLASS CO (Classroom Organization) Score*
*#/% = Number of programs and Percent of programs at each level of compliance*

When comparing these groupings in Table 3a the results from a One Way ANOVA were significant ($F = 4.92$; $p < .001$) for the CLASS/IS Scores. The average CLASS/IS Score when there were no CM Violations was 3.03. The average CLASS/IS Score when there were 1-2 CM Violations was 3.15. The average CLASS/IS Score when there were 3-8 CM Violations was 2.87. The average CLASS/IS Score when there were 9-19 CM Violations was 2.65. And finally, the average CLASS/IS Score when there were 20-25 violations was 2.56. The results were very similar with the CLASS/ES and CLASS/CO scores as well in which the results from a One Way ANOVA were statistically significant for the CLASS/ES ($F = 4.918$; $p < .001$) and for the CLASS/CO ($F = 4.174$; $p < .003$). These results clearly demonstrate that being in full or substantial compliance with the Compliance Measures correlates with more positive scores on the CLASS. Approximately 55% of the Head Start programs are at the full or substantial compliance level.

The practical implication of the above findings is that placing equal emphasis on full as well as substantial compliance with the Compliance Measures could be an acceptable public policy decision.

**Section 4 – Head Start Key Indicators (HSKI)**

The fourth and final section of this report is in some ways the most important since this is the focus of the study: developing statistically predictive Key Indicator (KI) Compliance Measures (CM) – the Head Start Key Indicators (HSKI).

These are the statistically predictive Key Indicators based upon the KI methodology, correlations with the CLASS/ES, CO, IS, and correlations with the CM Total Violation scores. Table 4 lists the results while Appendix 1 has the specific KI's content specified. Appendix 2 depicts the KI Formula Matrix. Only those Compliance Measures (CM) that had significant results on three of the five correlations were selected to be Head Start Key Indicator Compliance Measures (HSKI).

The methodology used to generate the Compliance Measure Key Indicators sorted the top 20% of programs in compliance and compared this group to the bottom 27% of programs in compliance. The middle 53% of programs were not used in order to determine the Key Indicators. These cut off points were determined by the compliance distribution in which 20% of the programs were in 100% compliance while 27% of the programs had compliance scores of 95% or less.

**Table 4 – Head Start Key Indicator (HSKI) Compliance Measures (CM) and CLASS and Total Violations**

| HSKI/CM (2013) | Phi | CLASS/ES | CLASS/CO | CLASS/IS | Total Violations |
|---|---|---|---|---|---|
| CDE4.1 | .28*** | .10* | ns | ns | .30*** |
| CHS1.1 | .39*** | .15** | .16** | ns | .39*** |
| CHS1.2 | .33*** | .18** | .15** | .10* | .36*** |
| CHS2.1 | .49*** | .18** | .15** | ns | .54*** |
| CHS3.10 | .39*** | .11* | .11* | ns | .24*** |
| GOV2.1 | .31*** | .11* | ns | ns | .46*** |
| SYS2.1 | .47*** | .15** | .16** | .14** | .55*** |
| SYS3.4 | .58*** | .13* | .10* | ns | .36*** |

***Phi = the phi coefficient which statistically predicts compliance with the full set of CM's.***

***CLASS/ES = correlations between the specific CM and this specific scale of the CLASS.***
***CLASS/CO = correlations between the specific CM and this specific scale of the CLASS.***
***CLASS/IS = correlations between the specific CM and this specific scale of the CLASS.***

***Total Violations = correlations between the specific CM and the total number of CM violations for each program.***

****  $p < .05$***
*****  $p < .01$***
******  $p < .001$***
***ns = not significant***

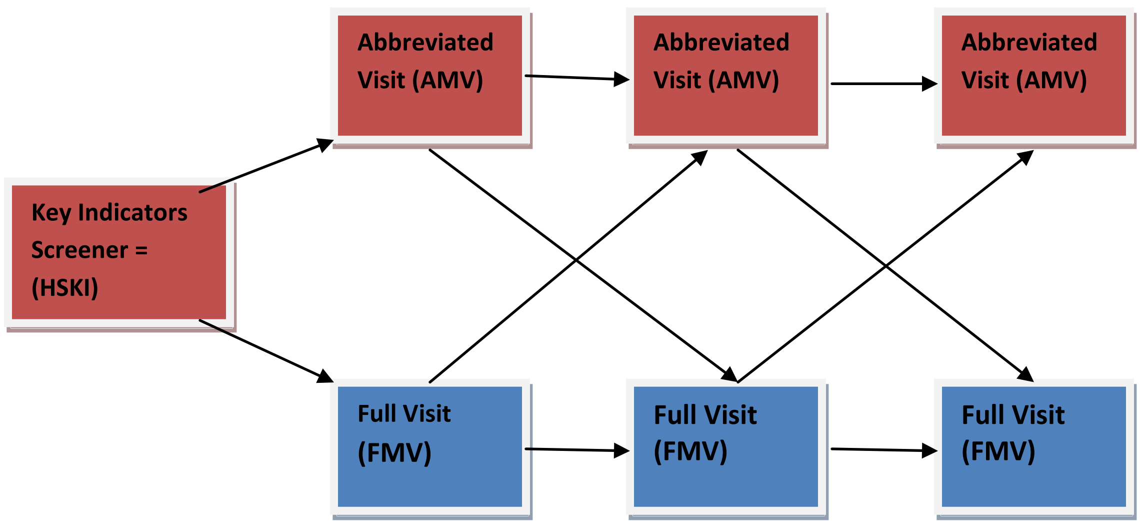
Separate Key Indicators were run for just Head Start only and Head Start/Early Head Start programs but the key indicators were only a subset of the above list, albeit a shorter list in each case. Based upon those phi coefficients, it was determined that using the above list for all Head Start only, Early Head Start, and Head Start/Early Head Start was a more efficient and effective way to monitor all the programs with one list of indicators rather than having separate key indicators for program types. The separate phi coefficients run for Head Start only and Head Start/Early Head Start programs did not show any significant differences because they were sub-samples of the overall sample drawn.

**Section 4A – Suggested Use of the HSKI for Head Start Program Monitoring**

Now that Key Indicators have been generated, the next question is how to use HSKI in the program monitoring of Head Start. A possible way in which the HSKI could be used would be the following (see Figure 1) in which a differential monitoring approach could be used:

All programs would be administered the HSKI. If there is full (100%) compliance with the Head Start Key Indicators (HSKI) then the next scheduled review of the program would be an Abbreviated Monitoring Visit (AMV). If there is not 100% compliance with the Head Start Key Indicators (HSKI) then the next scheduled review of the program would be a Full Monitoring Visit (FMV) in which all Compliance Measures are reviewed. Based upon the results of the FMV a determination could be made regarding a compliance or non-compliance decision (see Figure 1) and how often the program will be visited.

**Figure 1 – Head Start Key Indicator (HSKI) Compliance Measures Differential Monitoring Model**




**Compliance Decisions:**

*Head Start Key Indicators (HSKI) – this becomes a screening tool to determine if a program receives an AMV OR FMV visit.*

***HSKI (100%)*** *= For the next visit, an Abbreviated Monitoring Visit (AMV) is conducted. Every 3-4 yrs a full Monitoring is conducted.*

***HSKI (not 100%)*** *= For the next visit, a Full Monitoring Visit (FMV) is conducted and all CMs are reviewed.*

***Compliance*** *= 98%+ with all CMs which indicates substantial to full compliance and 100% with HSKI. For the next visit, an Abbreviated Monitoring Visit (AMV) is conducted.*

***Non-compliance*** *= less than 98% with all CMs which indicates low compliance. For the next visit a Full Monitoring Visit (FMV) is conducted.*

Moving to a differential monitoring system could provide a cost effective and efficient model for Head Start program monitoring. This revision to the Head Start program monitoring system would combine a risk assessment and key indicator approach (see Appendix 3) in determining what compliance measures to review, how often, and how comprehensive a review should be utilized. It would continue to focus on the most critical compliance measures that statistically predict overall compliance with the full complement of compliance measures.

See Appendix 7 – Figure 2 for how the above differential monitoring system could impact the present Head Start Tri-Annual Review Monitoring System. In this appendix, a cost neutral monitoring system is proposed based upon the above DMLMA/Key Indicator Model.

**References**


Fiene (2013). *Differential monitoring logic model & algorithm*, Research Institute for Key Indicators, Middletown, Pennsylvania.

Fiene (2003). Licensing related indicators of quality child care, *Child Care Bulletin*, Winter 2002-2003, pps 12-13.

Fiene (1985). Measuring the effectiveness of regulations, *New England Journal of Human Services, 5*(2), 38-39.

Fiene (1981). A new tool for day care monitoring introduced by children's consortium, *Evaluation Practice, 1*(2), 10-11.

Fiene & Kroh (2000). Licensing Measurement and Systems, *NARA Licensing Curriculum*. Washington, D.C.: National Association for Regulatory Administration.

Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly, 14*(3), 198-214.

Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators*. Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.


**Footnotes**

1) PIR Dashboard Key Indicators could not be generated because the PIR data demonstrated little statistical predictive ability to be useful for discriminating between high and low compliant programs or program quality with the exception of staff having CDA's.

2) The correlation between Compliance Measures (CM) and the statistically predictive Key Indicators (HSKI) was .77 which exceeds the expected correlation threshold.

3) The correlations between the CLASS/ES, CO, IS and Key Indicators were the following: .27, .25, .17 respectively. The correlations between KI and ES and CO were higher than the correlations between CM and ES, CO as reported earlier in this report. The correlation between IS and CM was higher .20 than KI and IS (.17).

4) Because this study spans the 2012 Review Protocol and 2013 Monitoring Protocol, Compliance Indicators and Compliance Measures are used interchangeably with a preference given to using Compliance Measures (CM) in this report. There are 139 Compliance Indicators; 115 Compliance Measures, but for the purposes of this study 131 Compliance Measures were available in the 2012 Head Start data base drawn for this study.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February 2013 (revised March, April 2013)

## Appendix 1 – Head Start Key Indicators (HSKI) Compliance Measures Content

| CM | Content | Regulations/Law |
|---|---|---|
| CDE4.1* | The program hires teachers who have the required qualifications, training, and experience. | 1304.52(f), 645A(h)(1), 648A(a)(3)(B)(i), 648A(a)(3)(B)(ii), 648A(a)(3)(B)(iii) |
| CHS1.1 | The program engages parents in obtaining from a health care professional a determination of whether each child is up to date on a schedule of primary and preventive health care (including dental) and assists parents in bringing their children up to date when necessary and keeping their children up to date as required. | 1304.20(a)(1)(ii), 1304.20(a)(1)(ii)(A), 1304.20(a)(1)(ii)(B) |
| CHS1.2 | The program ensures that each child with a known, observable, or suspected health, oral health, or developmental problem receives follow-up and further testing, examination, and treatment from a licensed or certified health care professional. | 1304.20(a)(1)(iii), 1304.20(a)(1)(iv), 1304.20(c)(3)(ii) |
| CHS2.1 | The program, in collaboration with each child's parent, performs or obtains the required linguistically and age-appropriate screenings to identify concerns regarding children within 45 calendar days of entry into the program, obtains guidance on how to use the screening results, and uses multiple sources of information to make appropriate referrals. | 1304.20(a)(2), 1304.20(b)(1), 1304.20(b)(2), 1304.20(b)(3) |
| CHS3.10 | Maintenance, repair, safety of facility and equipment | 1304.53(a)(7) |
| GOV2.1* | Members of the governing body and the Policy Council receive appropriate training and technical assistance to ensure that members understand information they receive and can provide effective oversight of, make appropriate decisions for, and participate in programs of the Head Start agency. | 642(d)(3) |
| SYS2.1 | The program established and regularly implements a process of ongoing monitoring of its operations and services, including delegate agencies, in order to ensure compliance with Federal regulations, adherence to its own program procedures, and progress towards the goals developed through its Self-Assessment process. | 1304.51(i)(2), 641A(g)(3) |
| SYS3.4 | Prior to employing an individual, the program obtains a: Federal, State, or Tribal criminal record check covering all jurisdictions where the program provides Head Start services to children; Federal, State, or Tribal criminal record check as required by the law of the jurisdiction where the program provides Head Start services; Criminal record check as otherwise required by Federal law | 648A(g)(3)(A), 648A(g)(3)(B), 648A(g)(3)(C) |

**** FY 2013 Office of Head Start Monitoring Protocol (October 26, 2013) Compliance Measures***

## Appendix 2: Key Indicator Formula Matrix for HSKI – Head Start Key Indicators

| | *Providers In Compliance* | *Programs Out Of Compliance* | *Row Total* |
|---|---|---|---|
| *High Group* | *A* | *B* | *Y* |
| Low Group | C | D | *Z* |
| *Column Total* | *W* | *X* | Grand Total |

### Key Indicator Statistical Methodology (Calculating the Phi Coefficient):

$$\phi = (A)(D) - (B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

---

*A = High Group + Programs in Compliance on Specific Compliance Measure.*
*B = High Group + Programs out of Compliance on Specific Compliance Measure.*
*C = Low Group + Programs in Compliance on Specific Compliance Measure.*
*D = Low Group + Programs out of Compliance on Specific Compliance Measure.*

*W = Total Number of Programs in Compliance on Specific Compliance Measure.*
*X = Total Number of Programs out of Compliance on Specific Compliance Measure.*
*Y = Total Number of Programs in High Group.*
*Z = Total Number of Programs in Low Group.*

---

*High Group = Top 20% of Programs in Compliance with all Compliance Measures.*
*Low Group = Bottom 27% of Programs in Compliance with all Compliance Measures.*

| Phi Coefficient Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.26) | Good Predictor | Include on HSKI |
| (+.25) – (0) | Too Easy | Do not Include |
| (0) – (-.25) | Too Difficult | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

## Appendix 3

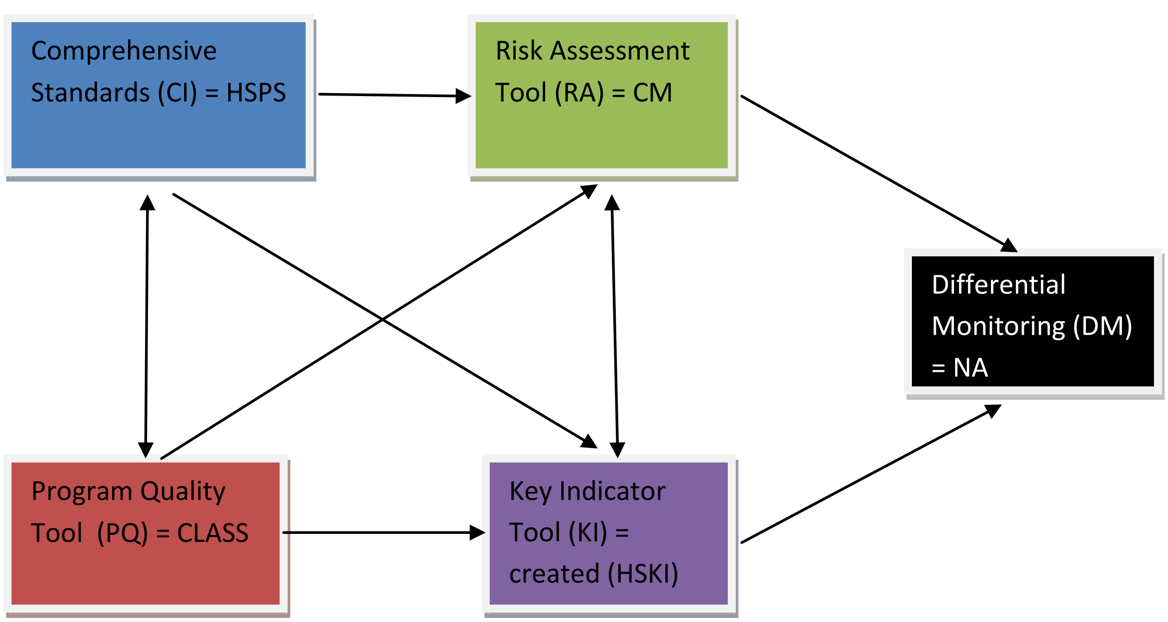
**DIFFERENTIAL MONITORING LOGIC MODEL AND ALGORITHM (Fiene, 2012) *DMLMA©* Applied to the Office of Head Start Program Monitoring Compliance System**

**CI + PQ => RA + KI => DM**

***<u>Head Start Examples:</u>***

**CI = Head Start Performance Standards (HSPS)**
**PQ = CLASS ES, IS, CO (CLASS)**
**RA = Compliance Measures (CM)**
**KI = Key Indicators (generated from this study = Head Start Key Indicators (HSKI))**
**DM = Not Applicable at this time (NA) but see Figure 1 for a proposed model**

***<u>DMLMA© Thresholds:</u>***
***High Correlations (.70+) = CI x KI.***
***Moderate Correlations (.50+) = CI x RA; RA x DM; RA x KI; KI x DM.***
***Lower Correlations (.30+) = PQ x CI; PQ x RA; PQ x KI.***



## Appendix 4: Content Areas and Compliance Measures

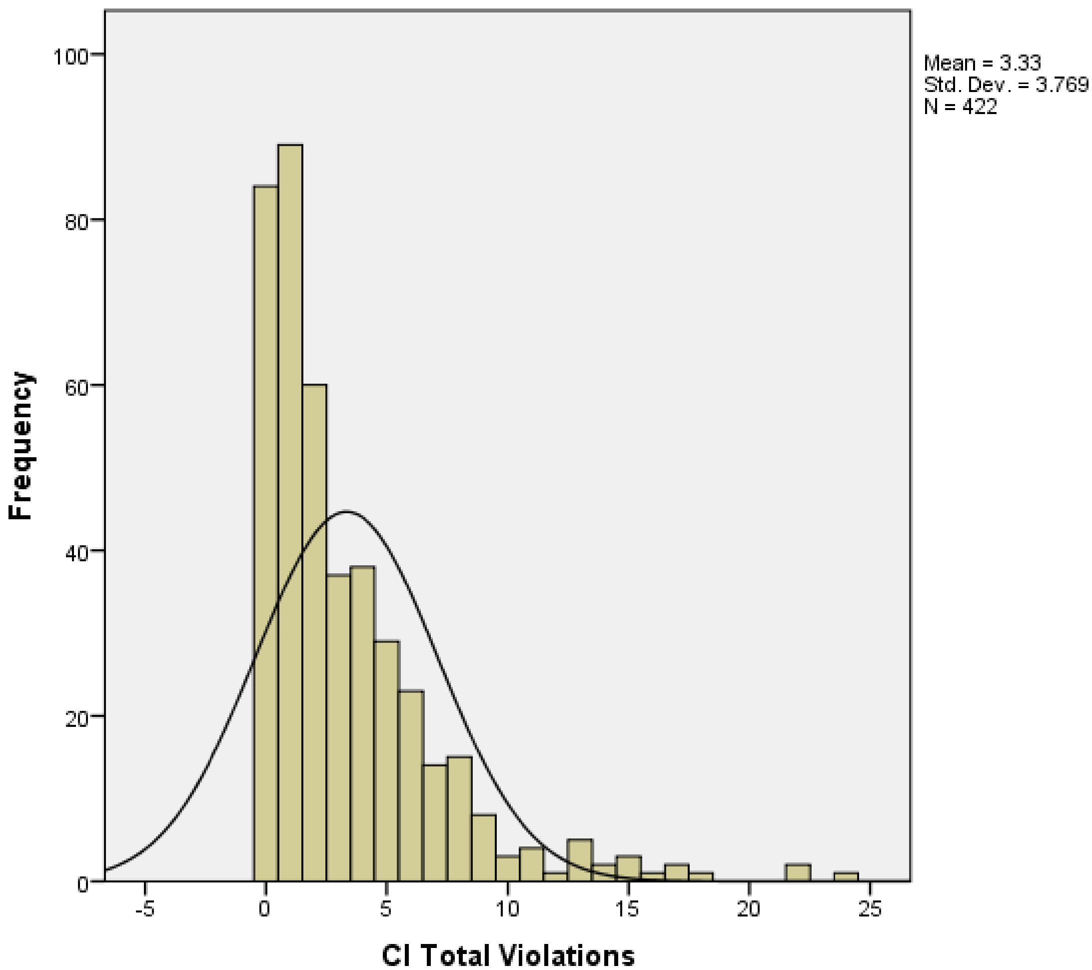
| Content Areas and Compliance Measures<br>*FY 2012 OHS On-Site Review Protocol (FY 2013 OHS Monitoring Protocol*) | Percent (%) Compliance |
|---|---|
| **CDE - CHILD DEVELOPMENT AND EDUCATION** | **99%** |
| 1.1(2.2) The program implements a curriculum that is aligned with the Head Start Child Development and Early Learning Framework... | 99% |
| 1.2 The program implements a curriculum that is evidence-based… | 99% |
| 1.3(2.1) The curriculum is comprehensive…. | 99% |
| 2.1 The program implements an infant toddler curriculum…. | 99% |
| 2.2 The program develops secure relationships in out of home care settings for infants and toddlers… | 100% |
| 2.3 The program implements an infant/toddler curriculum that encourages trust…. | 100% |
| 2.4 The program encourages the development of self-awareness, autonomy….. | 100% |
| 2.5 The program fosters independence. | 100% |
| 2.6 The program enhances each child's strengths by encouraging self control…. | 99% |
| 2.7 The program plans for routines and transitions….. | 99% |
| 2.9 The program encourages respect for others feelings and rights. | 99% |
| 2.10 The program provides opportunities for children to engage in child-initiated….. | 100% |
| 2.11 Nutrition services contribute to children's development and socialization….. | 100% |
| 3.1 The program uses information from screenings, ongoing observations….. | 99% |
| 3.3 The programs' nutrition program is designed and implemented to meet the nutritional needs…. | 98% |
| 3.4(CHS4.5) Meal and snack periods are appropriately scheduled…. | 99% |
| 3.5(3.2) Services provided to children with identified disabilities are designed to support….. | 100% |
| 3.6(3.3) The program designates a staff member or consultant to coordinate services for children w/disabilities… | 100% |
| 3.7(3.4) The program has secured the services of a mental health professional….. | 97% |
| 3.8(3.5) The program's approach to CDE is developmentally and linguistically appropriate…. | 99% |
| 4.1 The program establishes goals for improving school readiness….. | 98% |
| 4.2 The program uses self assessment information on school readiness goals….. | 99% |
| 4.3 The program demonstrates that children who are dual language learners….. | 100% |
| 5.1(4.1) The program hires teachers who have the required qualifications, training, & experience. | 92% |
| 5.2 The program ensures that family child care providers have the required qualifications…. | 100% |
| 5.3 The program ensures that all full time Head Start employees who provide direct education…. | 96% |
| 5.4 The program ensures that home visitors have the required qualifications, training…. | 99% |
| 5.5 When the majority of children speak the same language….. | 99% |
| **CHS - CHILD HEALTH AND SAFETY** | **97%** |
| 1.1 The program engages parents in obtaining from a health care professional a determination of whether each child…. | 89% |
| 1.2 The program ensures that each child with a known, observable, or suspected health, oral health….. | 92% |
| 1.3 The program involves parents, consulting with them immediately when child health or developmental problems….. | 100% |
| 1.4 The program informs parents and obtains authorization prior to all health procedures…. | 98% |
| 1.5 The program has established procedures for tracking the provision of health services. | 97% |
| 1.6 The EHS program helps pregnant women, immediately after enrollment in the program, access through referrals….. | 100% |
| 1.7 Program health staff conduct a home visit or ensure that a health staff member visits each newborn within 2 weeks of birth…. | 97% |
| 2.1 The program, in collaboration with each child's parent, performs or obtains the required screenings…. | 84% |
| 2.2 A coordinated screening, assessment, and referral process for all children…. | 98% |
| 2.3 The program, in partnership with the LEA or Part C Agency, works to inform and engage parents in all plans for screenings…. | 99% |
| 3.1 Facilities used for center based program options comply with state and local licensing…. | 100% |
| 3.2 The program ensures that sufficient equipment, toys, materials, and furniture are provided…. | 97% |
| 3.3 Precautions are taken to ensure the safety of children. | 99% |
| 3.4 The program ensures that medication is properly stored and is not accessible to children. | 98% |
| 3.5 The program ensures that no hazards are present around children. | 89% |
| 3.6 The program ensures that sleeping arrangements for infants do not use soft bedding materials. | 99% |
| 3.7 All infant and toddler toys are made of non-toxic materials and sanitized regularly. | 99% |
| 3.8 The program has adequate usable indoor and outdoor space. | 99% |
| 3.9 Outdoor play areas are arranged to prevent children from getting into unsafe or unsupervised areas….. | 100% |
| 3.10 The program provides for maintenance, repair, safety, and security of all Head Start facilities and equipment. | 85% |
| 3.11 The program's facilities provide adequately for children with disabilities….. | 100% |
| 4.1 Staff, volunteers, and children wash their hands with soap and running water. | 98% |
| 4.2 Spilled bodily fluids are cleaned up and disinfected immediately…. | 100% |
| 4.3 The program adopts sanitation and hygiene practices for diapering…… | 99% |

| | |
|---|---|
| 4.4(4.7) The program ensures that facilities are available for proper refrigerated storage and handling of breast milk and formula. | 100% |
| 4.5(4.8) Effective oral hygiene is promoted among children in conjunction with meals. | 99% |
| 5.1 The program ensures appropriate class and group sizes based on the predominant age of the children. | 99% |
| 5.2 The program ensures that no more than eight children are placed in an infant and toddler space….. | 99% |
| 6.1 The program's vehicles are properly equipped. | 99% |
| 6.2 At least one bus monitor is aboard the vehicle at all times. | 99% |
| 6.3 Children are released only to a parent…… | 99% |
| 6.4 Each bus monitor, before duty, has been trained on child boarding and exiting procedures…… | 99% |
| 6.5 The program ensures that persons employed to drive vehicles receive the required behind the wheel training…. | 99% |
| 6.6 Specific types of transportation assistance offered are made clear to all prospective families… | 100% |
| **ERSEA – ELIGIBILITY, RECRUITMENT, SLECTION, ENROLLMENT, AND ATTENDANCE** | **98%** |
| 1.1 The program developed and implemented a process that is designed to actively recruit families….. | 99% |
| 1.2 The program has a systematic process for establishing selection criteria…… | 99% |
| 1.3 The program has established and implemented outreach and enrollment policies and procedures…. | 99% |
| 2.1 Program staff verified each child's eligibility…… | 94% |
| 2.2 The program enrolls children who are categorically eligible….. | 99% |
| 2.3 The American Indian or Alaskan Native programs ensure that the children who meet the following requirements…. | 100% |
| 3.1 Actual program enrollment is composed of at least 10 percent children with disabilities. | 96% |
| 3.2 The program enrolled 100% of its funded enrollment….. | 98% |
| 3.3 The program has documentation to support monthly enrollment data ….. | 98% |
| 4.1 When monthly average daily attendance in center based programs falls below 85%, the causes of absenteeism…. | 99% |
| 4.2 The program ensures that no child's enrollment or participation in the Head Start program is contingent on payment of a fee. | 99% |
| **FCE – FAMILY AND COMMUNITY ENGAGEMENT** | **99%** |
| 1.1(1.2) Program staff are familiar with the backgrounds of families and children….. | 100% |
| 1.2(1.3) A strength based and family driven collaborative partnership building process is in place….. | 100% |
| 1.3(1.4) The program provides resources and services for families' needs, goals, and interests….. | 99% |
| 2.1 The program provides opportunities for parents to enhance their parenting skills….. | 99% |
| 2.2 Parents and staff share their respective concerns and observations about their individual children….. | 99% |
| 2.3 On site mental health consultation assists the program in providing education to parents…… | 97% |
| 3.1 Program staff plan, schedule, and facilitate no fewer than two staff parent conferences…… | 98% |
| 3.2(1.1) The program is open to parents during all program hours…. | 99% |
| 3.3(3.2) In home based settings, programs encourage parents to be integrally involved in their children's development. | 99% |
| 3.4(3.3) Programs provide opportunities for children and families to participate in literacy services…… | 99% |
| 3.5(3.4) The program builds parents' confidence to advocate for their children by informing parents of their rights….. | 99% |
| 4.1 The program has procedures to support successful transitions for enrolled children….. | 99% |
| 4.2 The program initiates transition planning for each EHS enrolled child at least 6 months prior to the child's 3rd birthday…. | 99% |
| 5.1 The program has established and maintains a health services advisory committee. | 97% |
| 5.2 The program has taken steps to establish ongoing collaborative relationships with community organizations…. | 100% |
| 5.3 The program coordinates with and has current interagency agreements in place with LEA's….. | 98% |
| **FIS – FISCAL INTEGRITY** | **97%** |
| 1.1 The program's financial management systems provide for effective control….. | 94% |
| 1.2 The program sought and received prior approval in writing for budget changes…. | 99% |
| 1.3 The program minimized the time elapsing between the advancement of funds from the Payment Management System…. | 100% |
| 1.4 The program used Head Start funds to pay the cost of expenses…. | 99% |
| 1.5 The program has obtained and maintained required insurance coverage for risks and liabilities. | 99% |
| 2.1 Financial reports and accounting records are current, accurate, complete…. | 98% |
| 2.2 Monthly financial statements, are provided to program governing bodies and policy groups…. | 97% |
| 3.1(3.1) The program has procurement procedures that provide all requirements specified in the applicable statutes….. | 95% |
| 3.2(3.1) Contracts and delegate agency agreements are current, available, signed, and dated….. | 96% |
| 4.1 Original time records are prepared and properly signed by the individual employee & approved….. | 97% |
| 4.2 Head Start or EHS grant funds are not used as any part of the monetary compensation…. | 99% |
| 4.3 Total compensation for personal services charged to the grant are allowable and reasonable…. | 98% |
| 5.1 The grantee has implemented procedures to determine allowability, allocability, and reasonableness of costs….. | 95% |
| 5.2 Indirect cost charges are supported by a negotiated and approved indirect cost rate. | 100% |
| 5.3 If the grantee is required to allocate costs between funding sources, the program utilizes a method for allocating costs…. | 97% |
| 5.4 The financial records of the grantee are sufficient to allow verification that non-Federal participation is necessary….. | 90% |
| 5.5(5.3) The grantee can demonstrate that all contributions of non-Federal share are necessary and reasonable….. | 98% |
| 5.6(5.4) During each funding period reviewed the grantee charged to the award only costs resulting from obligations…. | 98% |
| 6.1(6.1;6.2) For grantees that own facilities purchased or constructed using Head Start grant funds, documentation is available…. | 97% |
| 6.2(6.1;6.2) The grantee meets property management standards for equipment purchased using HS funds….. | 94% |
| 6.3(6.1;6.2) Grantees that entered into a mortgage or other loan agreement using collateral property complied with Federal regs…. | 97% |
| 6.4(6.1;6.2) The amount which the grantee may claim a cost or non-Federal share contribution…… | 96% |
| **GOV – PROGRAM GOVERNANCE** | **96%** |

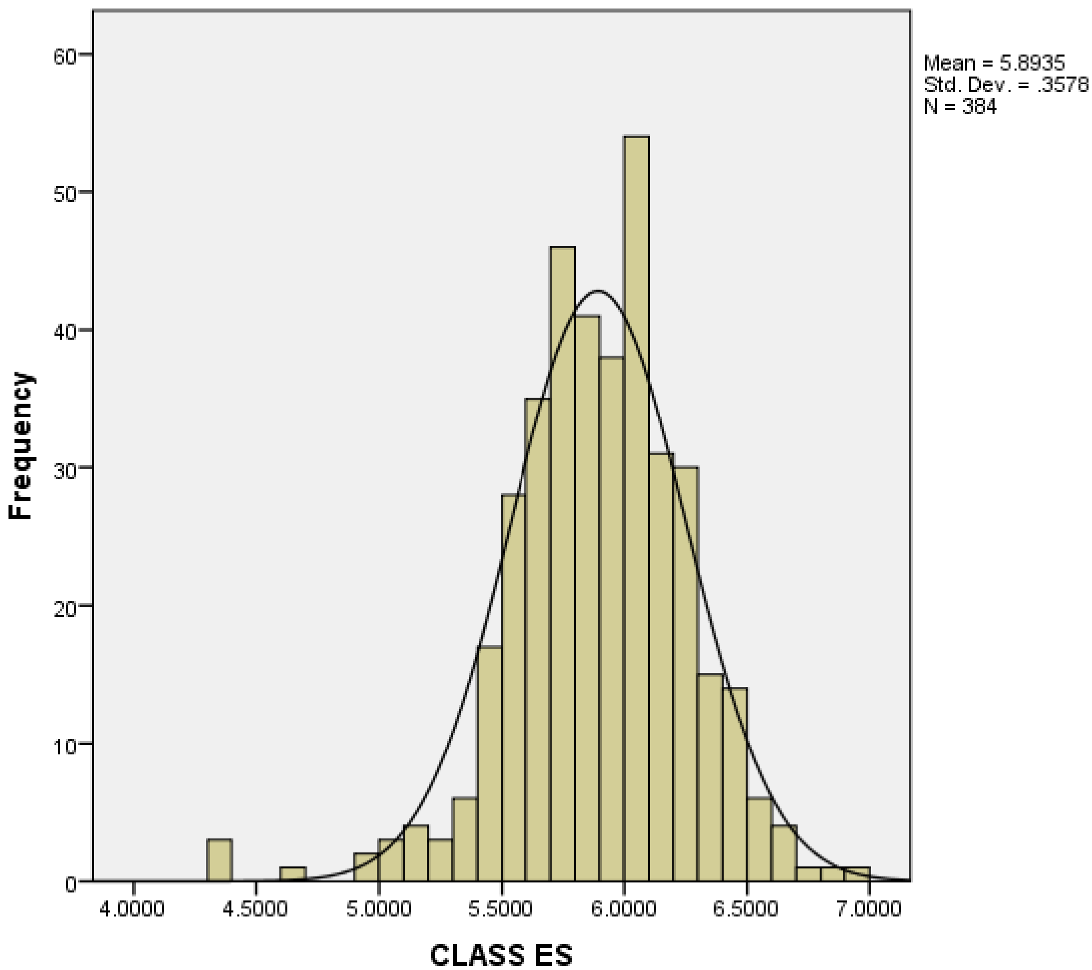
| | |
|---|---|
| 1.1 The program has a governing body…. | 98% |
| 1.2 The program has established a policy council…. | 98% |
| 2.1 Policy council and plicy committee members are supported by the program…. | 99% |
| 2.2 The program has policies and procedures in place to ensure that member of the governing body & PAC are free….. | 97% |
| 3.1(2.1) Members of the governing body and the PAC receive appropriate training and TA…… | 94% |
| 3.2(2.2) The governing body performs required activities and makes decisions pertaining to program administration…. | 95% |
| 3.3 The governing body approves financial management, accounting, and reporting policies….. | 99% |
| 3.4 The governing body reviews and approves all of the program's major policies…… | 95% |
| 3.5(2.4) The PAC approves and submits decisions about identified program activities to the governing body. | 98% |
| 4.1(3.1) Governing body and PAC members r3egulatly receive and use information about program planning….. | 88% |
| **SYS – MANAGEMENT SYSTEMS** | **91%** |
| 1.1 The program routinely engages in a process of systematic planning that utilizes the results of the community assessment…. | 97% |
| 1.2(5.1) At least annually, the program conducts a self assessment of program effectiveness…. | 97% |
| 2.1(5.2) The program established and regularly implements a process of ongoing monitoring of its operations and services…. | 86% |
| 2.2 The program established and maintains a record keeping system regarding children, families, and staff….. | 92% |
| 2.3 The program publishes and makes available to the public an annual report….. | 88% |
| 3.1 The program has established an organizational structure that provides for adequate supervision….. | 97% |
| 3.2 The program develops and implements written standards of conduct….. | 97% |
| 3.3 The program ensures that each staff member completes an initial health examination….. | 90% |
| 3.4 Prior to employing an individual, the program obtains: criminal record check…. | 66% |
| 4.1 The program has mechanisms for regular communication among all program staff…. | 98% |

## Appendix 5 – Histograms of Total Compliance Measure Violations, CLASS (IS, ES, CO) Scores and Head Start Key Indicator (HSKI) Scores

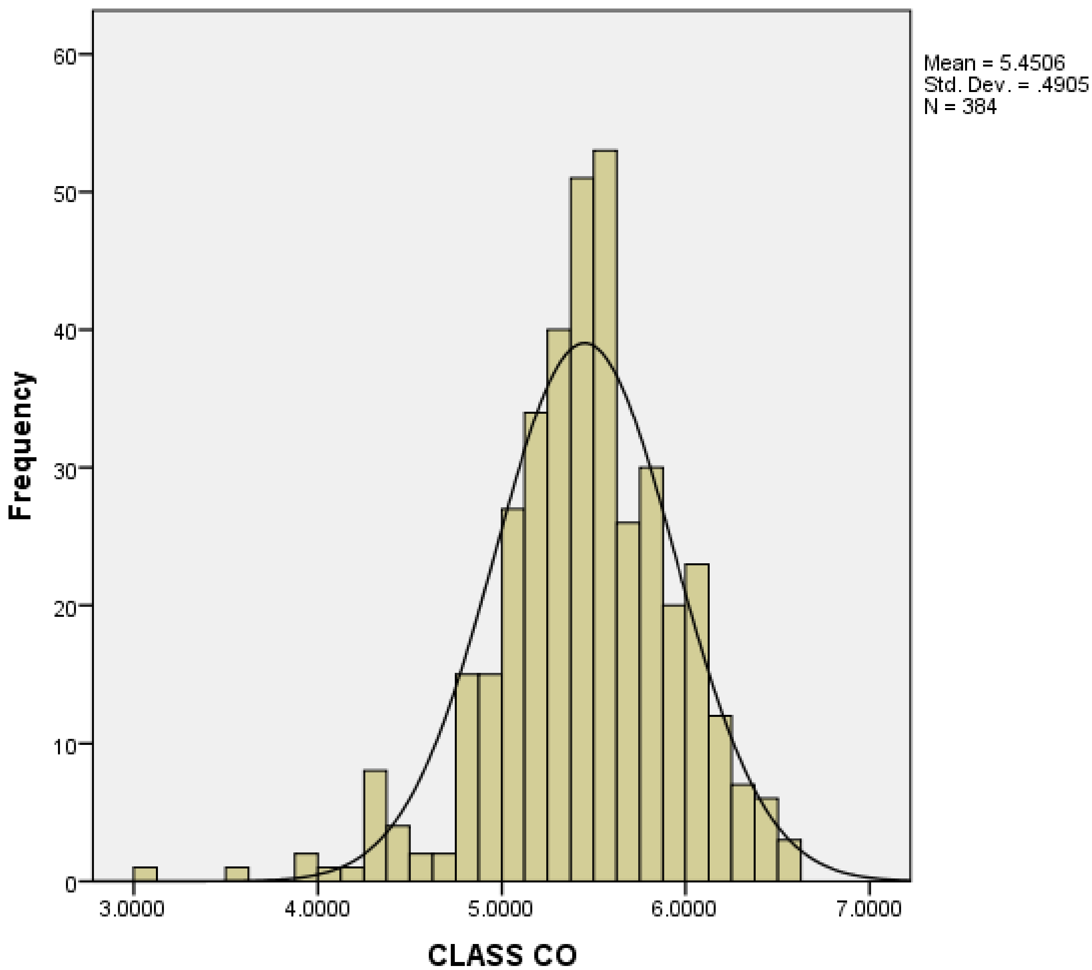
**Total Compliance Measure Violations**



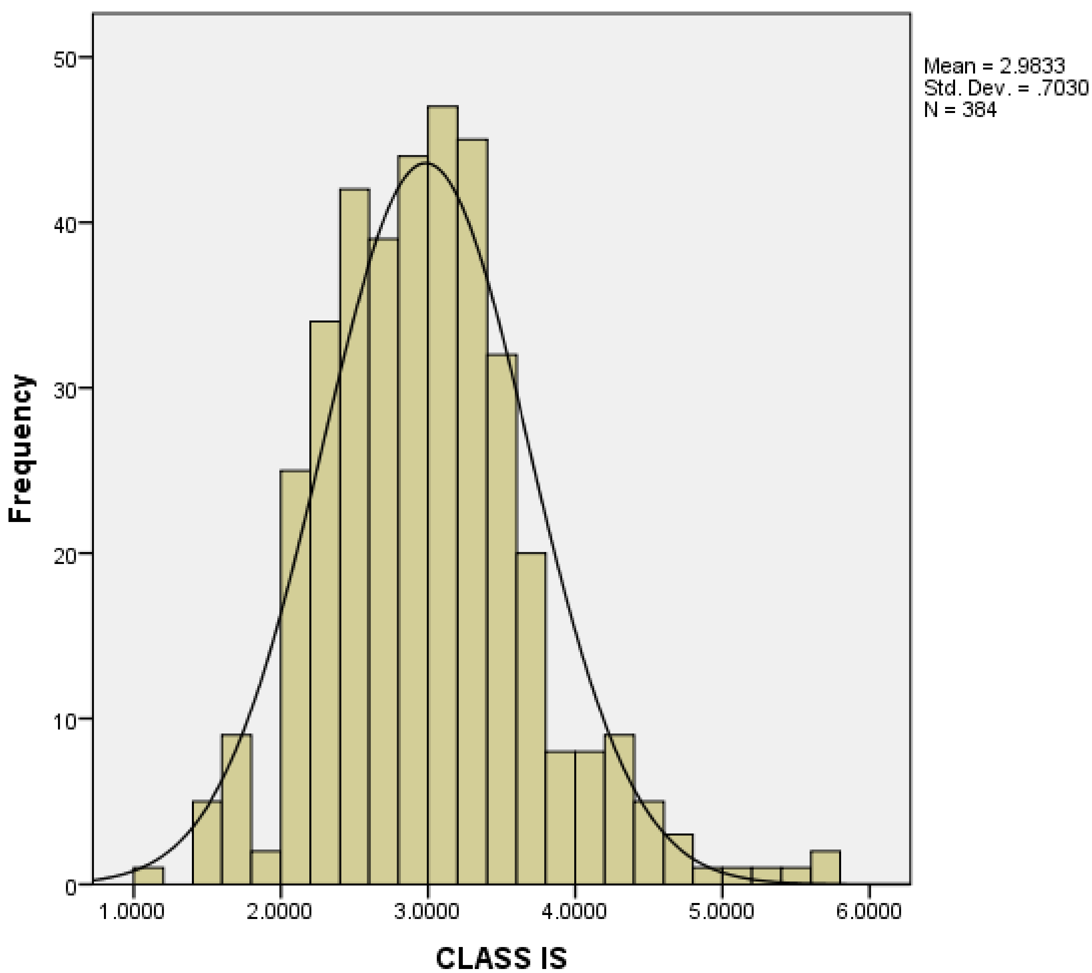
**CLASS ES Scores**



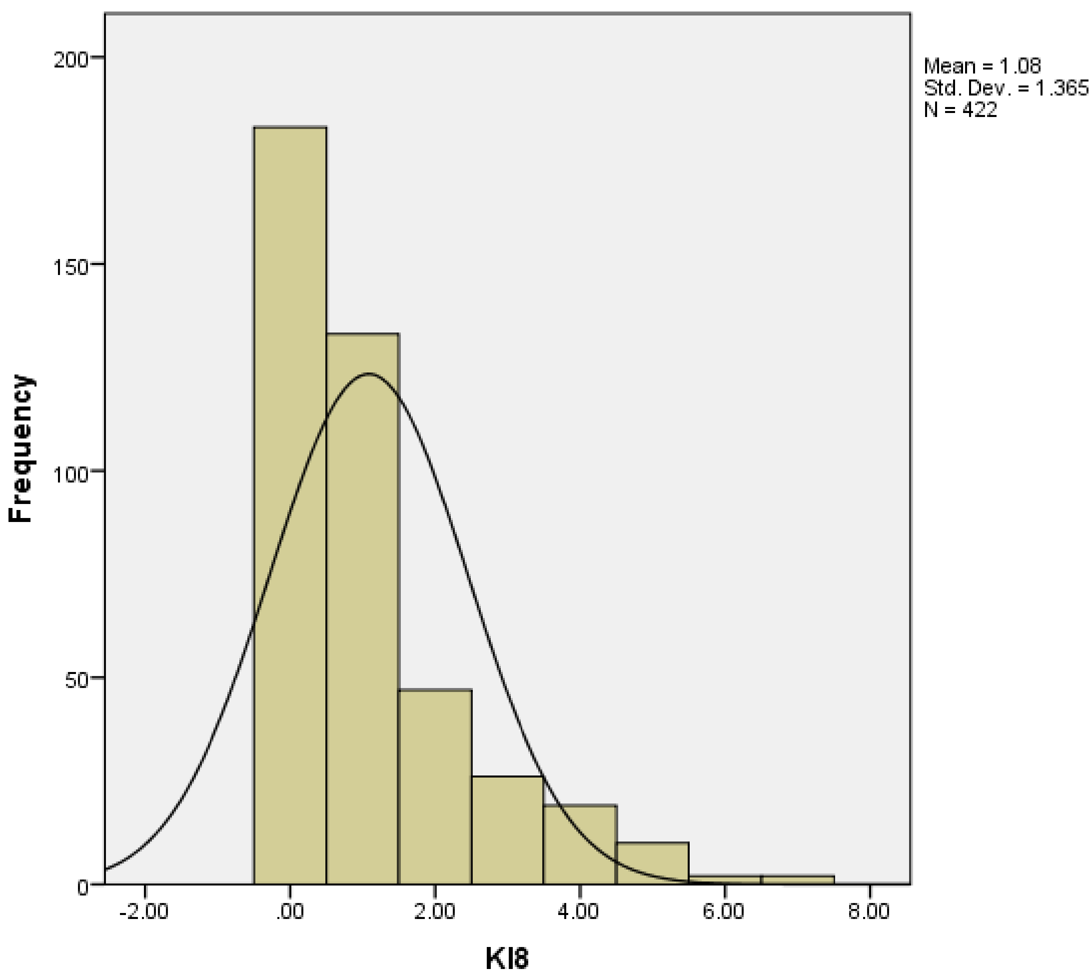
**CLASS CO Scores**



**CLASS IS Scores**



**Head Start Key Indicators (HSKI) Scores**



## Appendix 6 -

## CONTENT AREA (CA) CORRELATIONS

| | CHS | ERSEA | FCE | FIS | GOV | SYS |
|---|---|---|---|---|---|---|
| CDE | .33** | .26** | .06 | .14** | .13* | .33** |
| CHS | | .29** | .18** | .09 | .25** | .51** |
| ERSEA | | | .15** | .10* | .27** | .38** |
| FCE | | | | .01 | .17** | .23** |
| FIS | | | | | .13* | .23** |
| GOV | | | | | | .38** |

*** P < .05***

***** P < .01***

***<u>CONTENT AREAS (CA):</u>***
***FCE = FAMILY and COMMUNITY ENGAGEMENT***
***ERSEA = ELIGIBILITY, RECRUITMENT, SELECTION, ENROLLMENT, and ATTENDANCE***
**CDE = CHILD DEVELOPMENT AND EDUCATION**
***GOV = PROGRAM GOVERNANCE***
***FIS = FISCAL INTEGRITY***
***CHS =CHILD HEALTH AND SAFETY***
***<u>SYS = MANAGEMENT SYSTEMS</u>***

## Appendix 6A – Total Compliance with Compliance Measures, HSKI, and Content Area Correlations

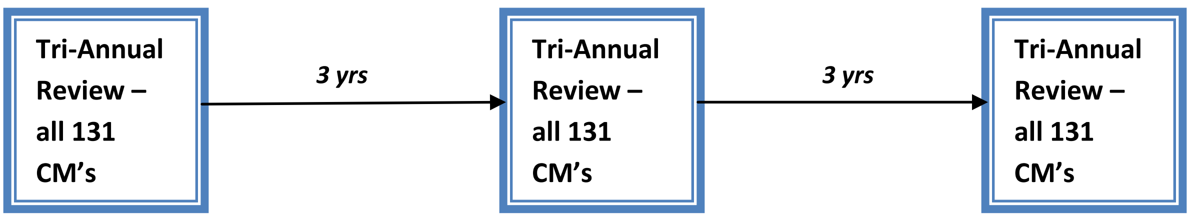
| | TOT | HSKI |
|---|---|---|
| CDE | .51** | .42** |
| CHS | .70** | .81** |
| ERSEA | .49** | .33** |
| FCE | .30** | .22** |
| FIS | .50** | .14** |
| GOV | .57** | .37** |
| SYS | .78** | .72** |

***TOT = Total Compliance with all Compliance Measures.***
***HSKI = Total Compliance with the Head Start Key Indicators.***

# Appendix 7 – Figure 2 – DMLMA Potential Impact on Tri-Annual Head Start Program Reviews

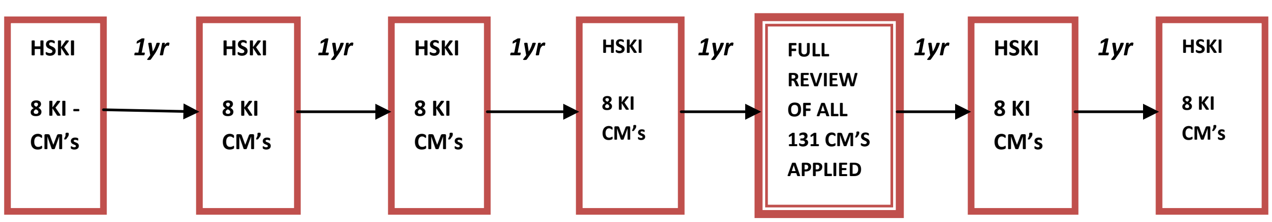
## Present Head Start Monitoring System:

**All programs receive the same Tri-Annual Reviews regardless of Compliance History:**

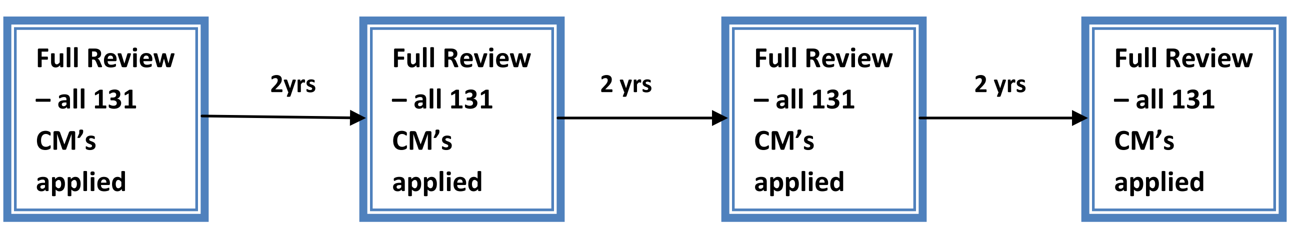



## Proposed DMLMA System with Key Indicators (KI):

***100% Compliance with the Head Start Key Indicators (HSKI):***




***If less than 100% with the Head Start Key Indicators (HSKI):***



The above proposed change is cost neutral by re-allocating monitoring staff from doing only Tri-Annual Reviews on every program to doing abbreviated monitoring via the HSKI on the highly compliant programs with periodic comprehensive full monitoring less frequently (this would change if a program did not continue to be 100% in-compliance with the HSKI), and only doing more comprehensive full monitoring on those programs with low compliance with the Compliance Measures and/or less than 100% compliance with the HSKI. Once a program was in the high compliance group they would be eligible for the HSKI abbreviated monitoring.

However, the real advantage in this proposed change is the increased frequency of targeted or differential monitoring of all programs.

**DMLMA Algorithm with Key Indicators applied to Head Start Tri-Annual Reviews:**

Six (6) Years example:

**Present Head Start Monitoring System:**

(Tri-Annual Visits)(Compliance Measures)(Percent of Programs(%)) = Total Effort
(3)(131)(100) = 39300
*Total Effort = **39300***

**Revised Head Start Monitoring DMLMA with Key Indicators System:**

*100% Compliance with HSKI:*
(Number of Monitoring Visits)(Compliance Measures)(Percent of Programs*(%)) = Total Effort
Abbreviated Monitoring Visits using Key Indicators: (6)(8)(43*) = 2064
Full, Comprehensive Monitoring Visit using all Compliance Measures: (1)(131)(43*) = 5633

*Less than 100% Compliance with HSKI:*
(Number of Monitoring Visits)(Compliance Measures)(Percent of Programs**(%)) = Total Effort
Full, Comprehensive Monitoring Visits using all Compliance Measures: (4)(131)(57**) = 29868

*100% Compliance with HSKI + Less than 100% Compliance with HSKI = Total Effort:*
*Total Effort = 2064 + 5633 + 29868 = **37565***

---

*This was the actual percent of Head Start Programs that met the criteria of 100% compliance with HSKI in this study.
**This was the actual percent of Head Start Programs that did not meet the criteria of 100% compliance with HSKI in this study.

It would be expected that the total population of Head Start programs would have a similar percent as was found in this representative sample (43% = 100% compliance with HSKI and 57% = less than 100% compliance with HSKI). This representative sample for this study constituted approximately 25% of all Head Start programs nationally.

**_Stepping Stones_ (3rd Edition) Key Indicators**

**Richard Fiene, Ph.D.**

**April 2013**

This short paper will present the Key Indicators as they appear in *Stepping Stones* (3rd edition). It provides the statistically predictive standards (Key Indicators) that could determine overall compliance with *Stepping Stones* (AAP, APHA, NRC, 2013) and *Caring for Our Children* (AAP, APHA, NRC, 2011) based upon the statistical methodology (Fiene & Nixon, 1985). But before delineating the Key Indicators a few definitions need to be provided to put these key indicators in perspective.

**Definitions:**

***Risk Assessment (RA)*** - a differential monitoring approach that employs using only those rules, standards, or regulations that place children at greatest risk of mortality or morbidity if violations/citations occur with the specific rule, standard, or regulation. *Stepping Stones* (3rd edition) is an example of a risk assessment approach.

***Key Indicators (KI)*** - a differential monitoring approach that employs using only those rules, standards, or regulations that statistically predict overall compliance with all the rules, standards, or regulations. In other words, if a program is 100% in compliance with the Key Indicators the program will also be in substantial to full compliance with all rules, standards, or regulations. The reverse is also true in that if a program is not 100% in compliance with the Key Indicators the program will also have other areas of non-compliance with all the rules, standards, or regulations. The key indicators put forth in this paper are an example of the approach.

***Differential Monitoring (DM)*** - this is a relatively new approach to determining the number of visits made to programs and what rules, standards, or regulations are reviewed during these visits. There are two measurement tools that drive differential monitoring, one is Weighted Risk Assessment tools and the other is Key Indicator checklists. Weighted Risk Assessments determine how often a program will be visited while Key Indicator checklists determine what rules, standards, or regulations will be reviewed in the program. Differential monitoring is a very powerful approach when Risk Assessment is combined with Key Indicators because a program is reviewed by the most critical rules, standards, or regulations and the most predictive rules, standards, or regulations. See Fiene's Logic Model & Algorithm for Differential Monitoring *(DMLMA©)(*Fiene, 2013).

**Early Childhood Program Quality Indicator Model (ECPQIM**)(Fiene, 2013; Fiene & Kroh, 2000; Griffin & Fiene, 1995; Fiene & Nixon, 1985) – this definition is provided to place the results of this paper into the larger program monitoring systems perspective. ECPQIM are models that employ a key indicator or dashboard approach to program monitoring. Major program monitoring systems in early care and education are integrated conceptually so that the overall early care and education system can be assessed and validated. With these models, it is possible to compare results obtained from licensing systems, quality rating and improvement systems (QRIS), risk assessment systems, key indicator systems, technical assistance, and child development/early learning outcome systems. The various approaches to validation (Zellman & Fiene, 2012) are interposed within this model and the specific expected correlational thresholds that should be observed amongst the key elements of the model are suggested. **Key Elements** of the model are the following: **CI** = Comprehensive Instrument - state or federal standards, usually rules or regulations that measure health and safety - *Caring for Our Children or Head Start Performance* Standards will be applicable here. Quality Rating and Improvement Systems (QRIS) standards at the state level; *ERS (ECERS, ITERS, FDCRS), CLASS, or CDPES* (Fiene & Nixon, 1985). **RA** = Risk assessment tools/systems in which only the most critical rules/standards are measured. *Stepping Stones* is an example of this approach. **KI** = Key indicators in which only predictor rules/standards are measured. The *Thirteen Indicators of Quality Child Care (Fiene, 2003)* is an example of this approach. **DM** = Differential monitoring decision making in which it is determined if a program is in compliance or not and the number of visits/the number of rules/standards are ascertained from a scoring protocol. **T**echnical assistance/training and/or professional development system which provides targeted assistance to the program based upon the Differential Monitoring results. And finally, child outcomes which assesses how well the children are developing which is the ultimate goal of the system.

## The Key Indicators from *Stepping Stones* (3rd Edition)[1]

**1.1.1.2 - Ratios for Large Family Child Care Homes and Centers**

**1.3.1.1 - General Qualifications of Directors**

**1.3.2.2 - Qualifications of Lead Teachers and Teachers**

**1.4.3.1 - First Aid and CPR Training for Staff**

**1.4.5.2 - Child Abuse and Neglect Education**

**2.2.0.1 - Methods of Supervision of Children**

**3.2.1.4 - Diaper Changing Procedure**

**3.2.2.2 - Handwashing Procedure**

**3.4.3.1 - Emergency Procedures**

**3.4.4.1 - Recognizing and Reporting Suspected Child Abuse, Neglect, and Exploitation**

**3.6.3.1 - Medication Administration**

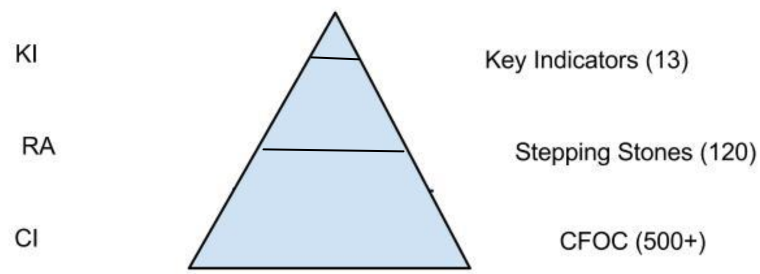
**5.2.7.6 - Storage and Disposal of Infectious and Toxic Wastes**

**6.2.3.1 - Prohibited Surfaces for Placing Climbing Equipment**

**7.2.0.2 - Unimmunized Children**

**9.2.4.5 - Emergency and Evacuation Drills/Exercises Policy**

Relationship of Key Indicators (KI), Stepping Stones (RA), and Caring for Our Children (CFOC)(CI)




The above diagram depicts the relationship amongst KI, RA, and CI in which the full set of rules is represented by CFOC - Caring for Our Children, followed by RA which are the most critical rules represented by Stepping Stones, and finally the predictive rules represented by the 13 Key Quality Indicators.

Just as there has been three editions of *Caring for Our Children* and *Stepping Stones*, this paper and the resulting Key Indicators represents the third edition of Key Indicators for early care and education. The first two editions are represented in the publications by Fiene & Nixon (1985) and Fiene (2003) respectively (see the reference list below).

**References**[2]

AAP, APHA, NRC (2011). *Caring for our children: National health and safety performance standards; Guidelines for early care and education programs. 3rd Edition*. Elk Grove Village, IL: American Academy of Pediatrics; Washington, DC: American Public Health Association.

AAP, APHA, NRC (2013). *Stepping stones to caring for our children: National health and safety performance standards; Guidelines for early care and education programs. 3rd Edition*. Elk Grove Village, IL: American Academy of Pediatrics; Washington, DC: American Public Health Association.

Fiene (2013). *Differential monitoring logic model & algorithm*, Research Institute for Key Indicators, Middletown, Pennsylvania.

Fiene (2003). Licensing related indicators of quality child care, *Child Care Bulletin*, Winter 2002-2003, pps 12-13.

Fiene (1985). Measuring the effectiveness of regulations, *New England Journal of Human Services, 5*(2), 38-39.

Fiene (1981). A new tool for day care monitoring introduced by children's consortium, *Evaluation Practice, 1*(2), 10-11.

Fiene & Kroh (2000). Licensing Measurement and Systems, *NARA Licensing Curriculum*. Washington, D.C.: National Association for Regulatory Administration.

Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly, 14*(3), 198-214.

Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators*. Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.

Zellman & Fiene (2012). *Validation of quality rating and improvement systems for early care and education and School-age care*, Washington, D.C.: OPRE and Child Trends.

**Notes:**

1 Please see Stepping *Stones (3rd edition)* and *Caring for Our Children (3rd edition)* for the details of each Key Indicator.

2 For the reader who is interested in learning more about the DMLMA/ECPQIM model, please refer to these publications which are available through the following website:

http://RIKInstitute.wikispaces.com

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# Kansas Child Care Licensing Key Indicator Study

**Richard Fiene, Ph.D.**

## INTRODUCTION

The purpose of this report is to provide the Kansas Child Care Office with basic analyses for the development of their key indicator system for both centers and homes. Licensing data from 2012 taken from both centers (CCC) (n = 482) and homes (FCC) (n = 500) were used in this Licensing Key Indicator study. The centers were further broken down into 52 (11%) Head Start programs and 430 (89%) child care centers. The homes were further broken down into 115 (23%) group homes and 385 (77%) family homes.

**Definitions:**

***Key Indicators (KI)*** = a differential monitoring approach that employs using only those rules that statistically predict overall compliance with all the rules. In other words, if a program is 100% in compliance with the Key Indicators the program will also be in substantial to full compliance with all rules. The reverse is also true in that if a program is not 100% in compliance with the Key Indicators, the program will also have other areas of non-compliance with all the rules. In this study, 8 Key Indicator rules were identified for CCC and 6 Key Indicator rules for FCC. The Key Indicators can be found in the Findings Section of this report.

***Rule Violations or Citations*** = this occurs when a program does not meet a specific rule and is cited as being out of compliance with that rule.

## METHODOLOGY

A *Differential Monitoring Logic Model and Algorithm (DMLMA©)(*Fiene, 2012) was employed, in particular, the key indicator methodology to generate the Key Indicators for this project. The DMLMA© is the 4th generation of an Early Childhood Program Quality Indicator Model (ECPQIM)(Fiene & Nixon, 1985; Griffin & Fiene, 1995; Fiene & Kroh, 2000).

The *DMLMA©* (see Figure 1) provides the conceptual model for assessing the overall effectiveness of a differential monitoring system. The two main tools in a Differential Monitoring (DM) system are Risk Assessment (RA) and Key Indicator (KI) measurement tools. Both the Risk Assessment and Key Indicator tools are derived from a comprehensive licensing tool (CI) that measures compliance with all rules. For the purposes of this study the Licensing Data taken from Kansas Monitoring Reviews represents the comprehensive licensing tool (CI). Kansas presently does not use a Risk Assessment or a Program Quality tool (see Table 1).

**Table 1**

| ***DMLMA©* Terminology** | **Kansas Examples and Data Sources** |
|---|---|
| Comprehensive Tool (CI) | Licensing Data from Kansas Monitoring Visits |
| Program Quality Tool (PQ) | Not Applicable |
| Risk Assessment Tool (RA) | Not Applicable |
| Key Indicators (KI) | Generated from this Study |
| Differential Monitoring (DM) | Not Applicable |

## FINDINGS

There are some overall demographic findings presented first that help to put the results in context. As mentioned in the introduction there were 482 centers and 500 homes that were part of these analyses. Eleven percent (11%) of the centers were 100% in compliance with all rules while 25% of the homes were 100% in compliance with all rules. These figures are fairly typical of state averages. The average number of violations for centers was 7.44 violations with all applicable rules and 3.52 violations for homes.

Location of the various facilities seemed to have an impact on average violations recorded. For example, with centers, urban facilities had a significantly higher level of violations (8.42 average violations; n = 279) than facilities located in rural communities (6.09 average violations; n = 203). This result was statistically significant ($F = 14.19$; $p < .0001$). However, the differences for homes was not statistically significant, with urban homes (n = 222) having 3.64 average violations versus 3.42 average violations for rural homes (n = 278).

There were statistically significant differences depending on the Region the facilities were located in. For centers, the highest levels of violations with child care rules were in Regions 1 (9.30 average violations; n = 109) and 2 (8.32 average violations; n = 191) while Regions 3 (5.31 average violations; n = 121) and 4 (5.57 average violations; n = 61) had lower averages (see Table 2). This result is statistically significant ($F = 9.82$; $p < .0001$).

**Table 2: Violation Data in Centers and Homes by Regional Location**

| Region | Centers | | Homes | |
|---|---|---|---|---|
| | Violations* | Number | Violations* | Number |
| 1 | 9.30 | 109 | 2.42 | 117 |
| 2 | 8.32 | 191 | 4.63 | 120 |
| 3 | 5.31 | 121 | 3.94 | 138 |
| 4 | 5.57 | 61 | 3.02 | 125 |

**** = Average Violations (Mean)***

For homes, a slightly different distribution occurs in which Region 2 (4.63 average violations; n = 120) was significantly higher than the other three regions. This result is statistically significant ($F = 7.24$; $p < .0001$).

Also the type of licensing inspection saw some variation in the average number of violations although none of the following results were statistically significant (see Table 3).

**Table 3: Violation Data in Centers and Homes by Type of Licensing Inspection**

| License Type | Centers | | Homes | |
|---|---|---|---|---|
| | Violations* | Number | Violations* | Number |
| Initial | 7.44 | 36 | 3.35 | 20 |
| Renewal | 7.07 | 368 | 3.53 | 469 |
| Amendment | 9.51 | 55 | 4.00 | 2 |
| Correction | 6.71 | 14 | 3.00 | 8 |
| Temporary | 11.22 | 9 | 4.00 | 1 |

**** = Average Violations (Mean)***

The last demographic analysis was to compare the average number of violations between group homes and family homes; and between child care centers and Head Start programs. There was not a significant difference between group homes (3.75 average violations; n = 115) and family homes (3.45 average violations; n = 385); but a statistically significant difference occurred ($F = 10.44$; $p < .001$) between child care centers (7.78 average violations; n =430) and Head Start programs (4.60 average violations; n = 52) with the Head Start programs having significantly fewer rule violations.

**Key Indicator Findings**

The following findings will provide the Key Indicators for centers (child care centers and Head Start) and homes (family and group homes). It will provide a listing of the rules and the respective phi coefficients. These Key Indicators were obtained from rank ordering the total compliance scores into quartiles with the 25% highest violation scores for facilities as the low group and the lowest 25% violation scores for facilities as the high group. Each rule was compared to this result by their respective compliance level, either being in or out of compliance with the rule. Once these data were prepared the formula in Table 4 was used to determine if the rule met the predictive level. Separate analyses for generating Key Indicators were not run for Head Start or Group Homes because of the insufficient number of programs in each category.

**Centers (Child Care Centers and Head Start)(See Table 5 for a Summary)**

All results are reported with the specific rule, $p < .0001$, and phi coefficient from the formula in Table 4.

K.A.R.28-4-126b1. Each person regularly caring for children shall have a health assessment conducted by a licensed physician or by a nurse trained to perform health assessments. The health assessment shall be conducted no earlier than one year before the date of employment or initial application for a license or certificate of registration, or not later than 30 days after the date of employment or initial application. (phi = .59)

K.A.R.28-4-126c1. Each person living, working or regularly volunteering in the facility shall have a record of a negative tuberculin test or x-ray obtained not more than two years before the employment or initial application, for a license or certificate of registration or not later than 30 days after the date of employment or initial application. (phi = .62)

K.A.R.28-4-423a18. The premises shall be maintained in good condition and shall be clean at all times, free from accumulated dirt and trash, and any evidence of vermin or rodent infestation. Each outdoor trash and garbage container shall be covered, and the contents shall be removed at least weekly. (phi = .59)

K.A.R.28-4-423a23. Medicines, household poisons, and other dangerous substances and instruments shall be in locked storage. (phi = .60)

K.A.R.28-4-428aa3. Each licensee shall ensure that orientation is completed by each staff member who will be counted in the staff-child ratio and by each volunteer who will be counted in the staff-child ratio. Each staff member and volunteer shall complete the orientation within seven calendar days after the date of employment or volunteering and before the staff member or volunteer is given sole responsibility for the care and supervision of children. (phi = .51)

K.A.R.28-4-428ac1. Each staff member counted in the staff-child ratio, each volunteer counted in the staff-child ratio, and each program director shall obtain certification in pediatric first aid and in pediatric CPR as specified in this subsection either before the date of employment or volunteering or not later than 30 calendar days after the date of employment or volunteering. (phi = .53)

K.A.R.28-4-430c3. Each staff member shall be trained to observe symptoms of illness, neglect, and child abuse, and shall observe each child's physical condition daily. (phi = .54)

K.A.R.28-4-437d. The outdoor play space shall be well drained and free of hazards. (phi = .59)

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Footnote:
Child Care Centers (CCC) – The correlation between the Key Indicators and all the rules was .77.
Family Child Care (FCC) – The correlation between the Key Indicators and all the rules was .80.
Both these results exceed the DMLMA© Thresholds for KI x CI (.70).

**Homes (Family and Group Homes)(See Table 5 for a Summary)**

All results are reported with the specific rule, $p < .0001$, and phi coefficient from the formula in Table 4.

K.A.R.28-4-115g1. All household cleaning supplies and all bodily care products bearing warning labels to keep out of reach of children or containing alcohol shall be in locked storage or stored out of reach of children under six years of age. Soap used for hand washing may be kept unlocked and placed on the back of the counter by a bathroom or kitchen sink. (phi = .47)

K.A.R.28-4-115aa1A. Supervision plan. Each applicant, each applicant with a temporary permit, and each licensee shall develop a supervision plan for children in care that includes all age ranges of children for whom care will be provided. A copy of the plan shall be available for review by the parents or legal guardians of children in care and by the department. The plan shall include the following: A description of the rooms, levels, or areas of the facility including indoor and outdoor areas in which the child will participate in activities, have snacks or meals, nap, or sleep. (phi = .79)

K.A.R.28-4-115aa1B. Supervision plan. Each applicant, each applicant with a temporary permit, and each licensee shall develop a supervision plan for children in care that includes all age ranges of children for whom care will be provided. A copy of the plan shall be available for review by the parents or legal guardians of children in care and by the department. The plan shall include the following: the manner in which supervision will be provided. (phi = .44)

K.A.R.28-4-117a1. A completed medical record on a form supplied by the department shall be on file for each child under 11 years of age enrolled for care and for each child under 16 living in the child care facility. (phi = .44)

K.A.R.28-4-117c. Immunizations for each child, including each child of the provider under 16 years of age shall be current as medically appropriate and shall be maintained current for protection from the diseases specified in K.A.R. 28-1-20(d). A record of each child's immunizations shall be maintained on the child's medical record. (phi = .68)

K.A.R.28-4-127b1A. Emergency medical treatment: Each facility shall have on file at the facility for each child: written permission of the parent, guardian, or legal custodian for emergency medical treatment on a form that meets the requirements of the hospital or clinic where emergency medical care will be given. (phi = .53)

**References**

Fiene (2012). *Differential monitoring logic model and algorithm (DMLMA©).* Middletown, PA: Research Institute for Key Indicators.

Fiene (2007). Child Development Program Evaluation & Caregiver Observation Scale, in T Halle (Ed.), *Early Care and Education Quality Measures Compendium*, Washington, D.C.: Child Trends.

Fiene (2003). Licensing related indicators of quality child care, *Child Care Bulletin*, Winter 2002-2003, pps 12-13.

Fiene (2002). *Thirteen indicators of quality child care: Research update*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services.

Fiene (1985). Measuring the effectiveness of regulations, *New England Journal of Human Services, 5*(2), 38-39.

Fiene & Kroh (2000). Licensing Measurement and Systems, *NARA Licensing Curriculum*. Washington, D.C.: National Association for Regulatory Administration.

Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly, 14*(3), 198-214.

Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators.* Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.

**Table 4: Kansas Key Indicator (KSKI) Formula Matrix**

| | *Providers In Compliance* | *Programs Out Of Compliance* | *Row Total* |
|---|---|---|---|
| *High Group* | *A* | *B* | *Y* |
| Low Group | C | D | *Z* |
| *Column Total* | *W* | *X* | Grand Total |

**Key Indicator Statistical Methodology (Calculating the Phi Coefficient):**

$$\phi = (A)(D) - (B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

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*A = High Group + Programs in Compliance on Specific Compliance Measure.*
*B = High Group + Programs out of Compliance on Specific Compliance Measure.*
*C = Low Group + Programs in Compliance on Specific Compliance Measure.*
*D = Low Group + Programs out of Compliance on Specific Compliance Measure.*

*W = Total Number of Programs in Compliance on Specific Compliance Measure.*
*X = Total Number of Programs out of Compliance on Specific Compliance Measure.*
*Y = Total Number of Programs in High Group.*
*Z = Total Number of Programs in Low Group.*

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*High Group = Top 25% of Programs in Compliance with all Compliance Measures.*
*Low Group = Bottom 25% of Programs in Compliance with all Compliance Measures.*

| Phi Coefficient Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.26) | Good Predictor | Include on KSKI |
| (+.25) – (0) | Too Easy | Do not Include |
| (0) – (-.25) | Too Difficult | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

**FIGURE 1- DIFFERENTIAL MONITORING LOGIC MODEL AND ALGORITHM (Fiene, 2012)**
***DMLMA*© Applied to the Kansas Child Care Licensing System**

**CI + PQ => RA + KI => DM**

***<u>Kansas Examples:</u>***

**CI = Licensing Reviews (All Rules)**
**PQ = Not Applicable (NA)**
**RA = Not Applicable (NA)**
**KI = Key Indicators (generated from this study)**
**DM = Not Applicable (NA)**

***DMLMA© Thresholds:***
***High Correlations (.70+) = CI x KI.***
***Moderate Correlations (.50+) = CI x RA; RA x DM; RA x KI; KI x DM.***
***Lower Correlations (.30+) = PQ x CI; PQ x RA; PQ x KI.***

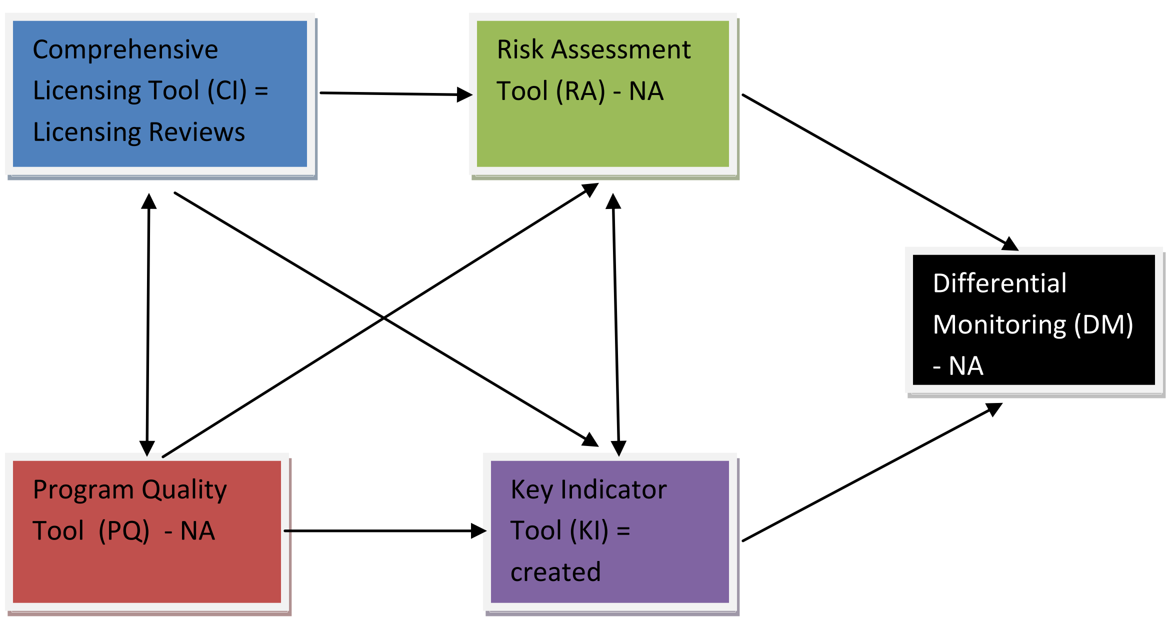

**Table 5 – Rule Numbers and Phi Coefficients for Centers and Homes**

| Centers Rule | Phi | Homes Rule | Phi |
|---|---|---|---|
| K.A.R.28-4-126b1. | .59 | K.A.R.28-4-115g1. | .47 |
| K.A.R.28-4-126c1. | .62 | K.A.R.28-4-115aa1A. | .79 |
| K.A.R.28-4-423a18. | .59 | K.A.R.28-4-115aa1B. | .44 |
| K.A.R.28-4-423a23. | .60 | K.A.R.28-4-117a1. | .44 |
| K.A.R.28-4-428aa3. | .51 | K.A.R.28-4-117c. | .68 |
| K.A.R.28-4-428ac1. | .53 | K.A.R.28-4-127b1A. | .53 |
| K.A.R.28-4-430c3. | .54 | | |
| K.A.R.28-4-437d. | .59 | | |

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# NARA Illinois Key Indicator Report for Centers, Group Homes, and Family Homes

**Richard Fiene, Ph.D.**

**May 30, 2014**


## ABSTRACT

This report will provide an analysis of Illinois Rules for child care centers, group homes, and family homes for generating key indicators. There is a brief introduction regarding differential monitoring and key indicators followed by the generated key indicators.


## INTRODUCTION

The key indicator methodology is part of a program monitoring approach called Differential Program Monitoring which was developed to help streamline the program monitoring of early care and education programs (please see the appendix for two graphics which help to depict this relationship). It was first applied in child care licensing but has been used in many other service types, such as: Head Start Performance Standards, National Accreditation, and child and adult residential programs. The methodologies are based upon statistical protocols that have been developed in the tests and measurements literature in which an abbreviated set of items is used to statistically predict as if the full test was applied. This methodology has been used in regulatory analysis and is now being proposed for use in Quality Rating and Improvement Systems (QRIS).

## TECHNICAL ASPECTS OF THE KEY INDICATOR METHODOLOGY

This section provides the technical and statistical aspects of the key indicator methodology. One of the first steps is to sort the data into high and low groups, generally the highest and lowest ratings can be used for this sorting. In very large states this is done on a sampling basis which will be described later in the blueprint. Frequency data will be obtained on those programs in the top level (usually top 20-25%) and the bottom level (usually the bottom 20-25%). The middle levels are not used for the purposes of these analyses. These two groups (top level & the bottom level) are then compared to how each program scored on each item within the specific assessment tool (see Figure 1).

| **Figure 1** | ***Providers In Compliance or Top 25%*** | ***Programs Out Of Compliance or Bottom 25%*** | ***Row Total*** |
|---|---|---|---|
| ***Highest level (top 20-25%)*** | ***A*** | **B** | ***Y*** |
| ***Lowest level (bottom 20-25%)*** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | ***Grand Total*** |

Once the data are sorted in the above matrix, the following formula (Figure 2) is used to determine if the standard is a key indicator or not by calculating its respective Phi coefficient. Please refer back to Figure 1 for the actual placement within the cells. The legend (Figure 3) below the formula shows how the cells are defined.

**Figure 2 – Formula for Phi Coefficient**

$$\phi = (A)(D) - (B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

**Figure 3 – Legend for the Cells within the Phi Coefficient**

*A = High Group + Programs in Compliance on Specific Compliance Measure.*
*B = High Group + Programs out of Compliance on Specific Compliance Measure.*
*C = Low Group + Programs in Compliance on Specific Compliance Measure.*
*D = Low Group + Programs out of Compliance on Specific Compliance Measure.*

*W = Total Number of Programs in Compliance on Specific Compliance Measure.*
*X = Total Number of Programs out of Compliance on Specific Compliance Measure.*
*Y = Total Number of Programs in High Group.*
*Z = Total Number of Programs in Low Group.*

Once the data are run through the formula in Figure 2, the following chart (Figure 4) can be used to make the final determination of including or not including the item as a key indicator. Based upon the chart in Figure 4, it is best to have a Phi Coefficient approaching +1.00 however that is rarely attained with licensing data but has occurred in more normally distributed data. Continuing with the chart in Figure 5, if the Phi Coefficient is between +.25 and -.25, this indicates that the indicator is unpredictable in being able to predict overall compliance with the quality rating assessment tool. Either a false positive in which the indicator appears too often in the low group as being in compliance, or a false negative in which the indicator appears too often in the high group as being out of compliance. This can occur with Phi Coefficients above +.25 but it becomes unlikely as we approach +1.00 although there is always the possibility that other standards/rules/regulations could be found out of compliance (this was demonstrated in a study conducted by the author. Another solution is to increase the number of key indicators to be reviewed but this will cut down on the efficiency which is desirable and the purpose of the key indicators.

The last possible outcome with the Phi Coefficient is if it is between -.26 and -1.00, this indicates that the indicator is a terrible predictor because it is doing just the opposite of the decision we want to make. The indicator would predominantly be in compliance with the low group rather than the high group so it would be statistically predicting overall non-compliance. This is obviously something we do not want to occur.

**Figure 4 – Thresholds for the Phi Coefficient**

| Phi Coefficient Range | Characteristic of Indicator | Decision |
|---|---|---|
| **(+1.00) – (+.26)** | **Good Predictor** | **Include** |
| **(+.25) – (-.25)** | **Unpredictable** | **Do not Include** |
| **(-.26) – (-1.00)** | **Terrible Predictor** | **Do not Include** |

## RESULTS

## Key indicators for child care homes (Please see the Appendix - Figure 7 for Phi Coefficients):

**Section 406.8 General Requirements for Day Care Homes**
a) The physical facilities of the home, both indoors and outdoors, shall meet the following requirements for safety to children.
1) The home shall have a first aid kit consisting of adhesive bandages, scissors, thermometer, non-permeable gloves, Poison Control Center telephone number (1-800-222-1222 or 1-800-942-5969), sterile gauze pads, adhesive tape, tweezers and mild soap.

18) There shall be written plans for fire and tornado emergencies. Caregivers and assistants in the home shall be familiar with these plans.
A) The fire evacuation plan shall identify the exits from each area used for child care and shall specify the evacuation route.
B) The fire evacuation plan shall identify a safe assembly area outside of the home. It shall also identify a near-by indoor location for post-evacuation holding if needed.
C) The fire evacuation plan shall require that the home be evacuated before calling the local emergency number 911.
D) The written tornado plan shall specify what actions will be taken in the event of tornado or other severe weather warning, including designation of those areas of the home to be used as the safe spots.

23) The licensee shall inspect the home daily, prior to arrival of children, ensuring that escape routes are clear and that exit doors and exit windows are operable. A log of these daily inspections shall be maintained for at least one year, and shall be available for review. The log shall reflect, at minimum, the date and time of each inspection and the full name of the person who conducted it.

24) The licensee shall hold monthly fire inspections of the day care home.

**Section 406.9 Characteristics and Qualifications of the Day Care Family**
a) No individual may receive a license from the Department when the applicant, a member of the household age 13 and over, or any individual who has access to the children cared for in a day care home, or any employee of the day care home, has not authorized the background check required by 89 Ill. Adm. Code 385 (Background Checks) and been cleared in accordance with the requirements of Part 385.

t) The caregivers shall complete 15 clock hours of in-service training per licensing year in accordance with the requirements in Appendix D of the rules.
1) Such training may be derived from programs offered by any of the entities identified in Appendix D of the rules.
2) Courses or workshops to meet this requirement include, but are not limited to, those listed in Appendix D of the rules.
3) The records of the day care home shall document the training in which the caregiver has participated, and these records shall be available for review by the Department.
4) Caregivers obtaining clock hours in excess of the required 15 clock hours per year may apply up to 5 clock hours to the next year's training requirements.

**Section 406.12 Admission and Discharge Procedures**
b) Prior to acceptance of a child for care~~,~~
3) The caregiver shall require that the parent or guardian provide a certified copy of the child’s birth certificate. The caregiver:

A) Shall provide a written notice to the parent or guardian of a child to be *enrolled for the first time that within 30 days* after enrollment the parent or guardian shall *provide a certified copy of the child's birth certificate or other reliable proof of identity and age of the child*.
i) The caregiver shall promptly make a copy of the certified copy and return the original certified copy to the parent or guardian.
ii) If a certified copy of the birth certificate is not available, the parent or guardian must submit *a passport, visa or other governmental documentation as proof of the child's identity and age* and *an affidavit* or notarized letter *explaining the inability to produce a certified copy of the birth certificate* [325 ILCS 50/5] .
iii) The notice to parent or guardian shall also indicate that the caregiver is required by law to notify the Illinois State Police or local law enforcement agency if the parent or guardian fails to submit proof of the child's identity within the 30 day time frame;

h) All day care homes shall have a written policy that explains the actions the provider will take if a parent or guardian does not retrieve, or arrange to have someone retrieve, his or her child at the designated, agreed upon time. The policy shall consist of the provider's expectations, clearly presented to the parent or guardian, in the form of a written agreement that shall be signed by the parent or guardian, and shall include at least the following elements:
The consequences of not picking up the child on time, including:
Amount of late fee, if any, and when those fees begin to accrue;
The degree of diligence the provider will use to reach emergency contacts, e.g., number of attempted phone calls to parents and emergency contacts, requests for police assistance in finding emergency contacts; and
Length of time the facility will keep the child beyond the pick-up time before contacting outside authorities, such as the child abuse hotline or police.
Emphasis on the importance of having up-to-date emergency contact numbers on file.
Acknowledgement of the provider's responsibility for the child's protection and well-being until the parent or outside authorities arrive.
A reminder to the day care provider that the child is not responsible for the situation. All discussions regarding these situations shall be with the parent or guardian, never the child.

**Section 406.14 Health, Medical Care and Safety**
c) A medical report, on forms prescribed by the Department, shall be on file for each child, on the first day of care, and shall be dated no earlier than 6 months prior to enrollment.
1) The medical report shall be valid for 2 years, except that subsequent examinations for school-age children shall be in accordance with the requirements of Section 27.8-1 of the School Code [105 ILCS 5/27-8.1], provided copies of the exam are on file at the facility.
2) If the child is in a high risk group, as determined by the examining physician, a tuberculin skin test by the Mantoux method and the results of that test shall be included in the initial examination for all children who have attained one year of age, or at the age of one year for children who are enrolled before their first birthday. The tuberculin skin test by the Mantoux method shall be repeated when the children in high-risk groups begin elementary and secondary school.
3) The initial examination shall show that children from 6 months through 6 years of age have been screened for lead poisoning for children residing in an area defined as high risk by the Illinois Department of Public Health in its Lead Poisoning Prevention Code (77 Ill. Adm. Code 845) or that a lead risk assessment has been completed for children residing in an area defined as low risk by the Illinois Department of Public Health.
4) The report shall indicate that the child has been immunized as required by the rules of the Illinois Department of Public Health for immunizations (77 Ill. Adm. Code 695). These required immunizations are poliomyelitis, measles, rubella, diphtheria, mumps, pertussis, tetanus, hepatitis B, haemophilus influenza B, and varicella (chickenpox) or provide proof of immunity according to requirements in Part 695.50 of the Department of Public Health.

## Key indicators for Group Child Care Homes (Please see the Appendix - Figure 7 for Phi Coefficients):

**Section 408.35 General Requirements for Group Day Care Home Family**
f) The caregivers and all members of the household shall provide medical evidence that they are free of communicable disease that may be transmitted while providing child care; and, in the case of caregivers, that they are free of physical or mental conditions that could interfere with child care responsibilities. The medical report for the caregivers shall be valid for 3 years.

**Section 408.45 Caregivers**
f) The caregivers shall complete 15 clock hours of in-service training per licensing year in accordance with the requirements in Appendix G of the rules.
1) Such training may be derived from programs offered by any of the entities identified in Appendix G of the rules.
2) Courses or workshops to meet this requirement include, but are not limited to, those listed in Appendix G of the rules.

**Section 408.60 Admission and Discharge Procedures**
j) All group day care homes shall have a written policy that explains the actions the provider will take if a parent or guardian does not retrieve, or arrange to have someone retrieve, his or her child at the designated, agreed upon time. The policy shall consist of the provider's expectations, clearly presented to the parent or guardian in the form of a written agreement that shall be signed by the parent or guardian, and shall include at least the following elements:
1) The consequences of not picking up the children on time, including:
A) Amount of late fee, if any, and when those fees begin to accrue;
B) The degree of diligence the provider will use to reach emergency contacts, e.g., number of attempted phone calls to parents and emergency contacts, requests for police assistance in finding emergency contacts; and
C) Length of time the facility will keep the child beyond the pick-up time before contacting outside authorities, such as the child abuse hotline or police.
2) Emphasis on the importance of having up-to-date emergency contact numbers on file.
3) Acknowledgement of the provider's responsibility for the child's protection and well-being until the parent or outside authorities arrive.
4) A reminder to staff that the child is not responsible for the situation. All discussions regarding these situations shall be with the parent or guardian, never with the child.

**Section 408.70 Health, Medical Care and Safety**
a) A medical report, on forms prescribed by the Department, shall be on file for each child, on the first day of care, and shall be dated no earlier than 6 months prior to enrollment.
1) The medical report shall be valid for 2 years, except that subsequent examinations for school-age children shall be in accordance with the requirements of Section 27-8.1 of the School Code [105 ILCS 5/27-8.1], provided copies of the exam are on file at the facility.
2) If the child is in a high risk group, as determined by the examining physician , a tuberculin skin test by the Mantoux method and the results of that test shall be included in the initial examination for all children who have attained one year of age, or at the age of one year for children who are enrolled before their first birthday. The tuberculin skin test by the Mantoux method shall be repeated when children in high risk groups begin elementary and secondary school.
3) The initial examination shall show that children from 6 months through 6 years of age have been screened for lead poisoning for children residing in an area defined as high risk by the Illinois Department of Public Health in its Lead Poisoning Prevention Code (77 Ill. Adm. Code 845) or that a lead risk assessment has been completed for children residing in an area defined as low risk by the Illinois Department of Public Health.
4) The report shall indicate that the child has been immunized as required by the rules of the Illinois Department of Public Health for immunizations (77 Ill. Adm. Code 695). These required immunizations are poliomyelitis, measles, rubella, diphtheria, mumps, pertussis, tetanus, hepatitis B, haemophilus influenza B, and varicella (chickenpox) or provide proof of immunity according to requirements in Part 695.50 of the Department of Public Health.

**Section 408.120 Records and Reports**

a) A facility shall maintain a record file on the children enrolled.

1) A written application for admission of each child shall be on file with the signature of the parent or guardian.

**Key indicators for Child Care Centers (Please see the Appendix-Figure 7 for Phi Coefficients):**

**Section 407.100 General Requirements for Personnel**
f) Staff shall have physical re-examinations every two years and whenever communicable disease or illness is suspected.

**Section 407.120 Personnel Records**
a) A confidential file shall be maintained on each staff person and contain at least the following information:
1) A copy of a form prescribed by the Department which contains information on persons employed in the day care center;
3) Three written character references, verified by the day care center;
4) Proof of educational achievement as required for the individual's position. Foreign credentials require additional documentation providing a statement of the equivalency in the U.S. educational system;

**Section 407.250 Enrollment and Discharge Procedures**
d) The facility shall distribute a summary of the licensing standards, provided by the Department, to the parents or guardian of each child at the time that the child is accepted for care in the facility. In addition, consumer information materials provided by the Department including, but not limited to, information on reporting and prevention of child abuse and neglect and preventing and reporting communicable disease shall be distributed to the parents or guardian or each child cared for when designated for such distribution by the Department.

**Section 407.260 Daily Arrival and Departure of Children**
f) All day care centers shall have a written policy that explains to parents and staff the actions the center will take if a parent or guardian does not pick up, or arrange to have someone pick up, his or her child at the designated, agreed upon time. The policy shall consist of the provider's expectations clearly presented to the parent or guardian in the form of a written agreement that shall be signed by the parent or guardian and shall include at least the following elements:
1) The consequences of not picking up children on time shall be precisely communicated to parents, for example:
A) Amount of late fee, if any, and when those fees begin to accrue.
B) The degree of diligence the provider will use to reach emergency contacts, e.g., number of attempted phone calls to parents and emergency contacts, requests for police assistance in finding emergency contacts, and so forth.
C) Length of time the facility will keep the child beyond the pick-up time before contacting outside authorities, such as, the child abuse hotline, police, and so forth.
2) Emphasis on the importance of having up-to-date emergency contact numbers on file.
3) Acknowledgement of the provider’s responsibility for the child’s protection and well-being until the parent or outside authorities arrive.
4) A policy that staff shall not hold the child responsible for the situation and that discussion of this issue will only be with the parent or guardian and never with the child.

**Section 407.270 Guidance and Discipline**
a) The day care center shall develop a guidance and discipline policy for staff use that is also provided to parents. Staff shall sign the guidance and discipline policy at the time of employment and parents shall sign the policy when their child is enrolled. The policy shall include:
1) A statement of the center's philosophy regarding guidance and discipline;
2) Information on how discipline will be implemented by staff;
3) Information on how parents will be involved in the guidance and discipline process;
4) Information on how children will be involved in the guidance and discipline process; and
5) Written procedures for termination of a child's enrollment in the day care center because of disciplinary issues.

**Section 407.310 Health Requirements for Children**
a) A medical report on forms prescribed by the Department shall be on file for each child.
1) The initial medical report shall be dated less than 6 months prior to enrollment of infants, toddlers and preschool children. For school-age children, a copy of the most recent regularly scheduled school physical may be submitted

(even if more than 6 months old) or the day care center may require a more recent medical report by its own enrollment policy. If a health problem is suspected, the day care center may require additional documentation of the child's health status.

**Section 407.380 Equipment and Materials**

b) Such equipment and materials for infants, toddlers and pre-school children shall be provided in the quantity and variety specified in Appendix A: Equipment for Infants and Toddlers, Appendix B: Equipment for Preschool Children and Appendix C: Equipment for School-Age Children of the Rules.

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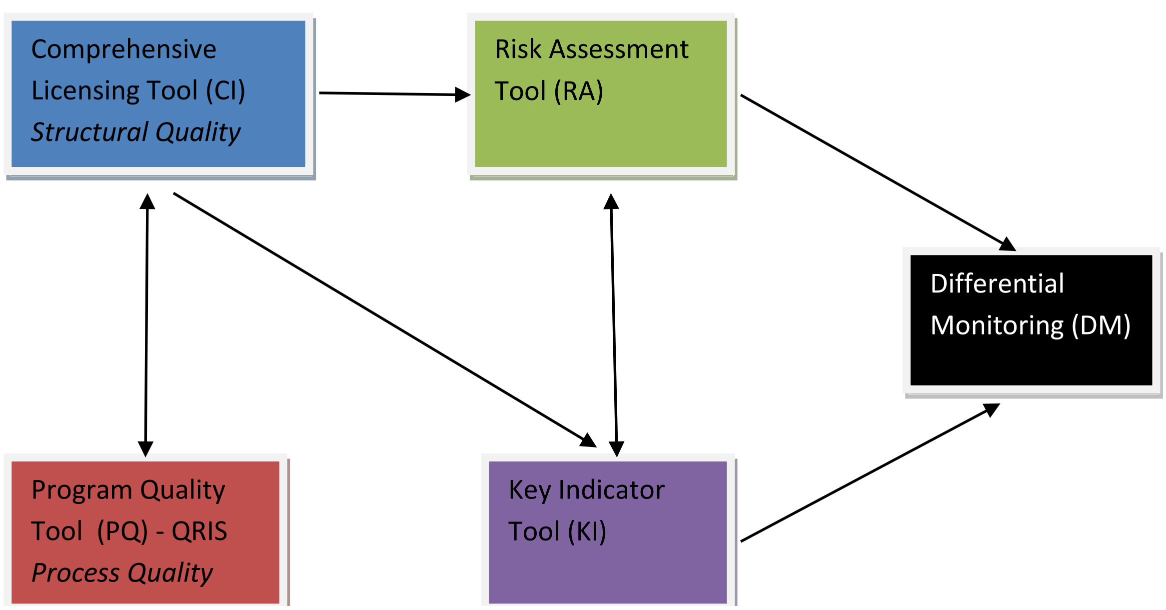
# Appendix – Figure 5

**DIFFERENTIAL MONITORING LOGIC MODEL & ALGORITHM (DMLMA©) (Fiene, 2012): A 4th Generation ECPQIM – Early Childhood Program Quality Indicator Model**

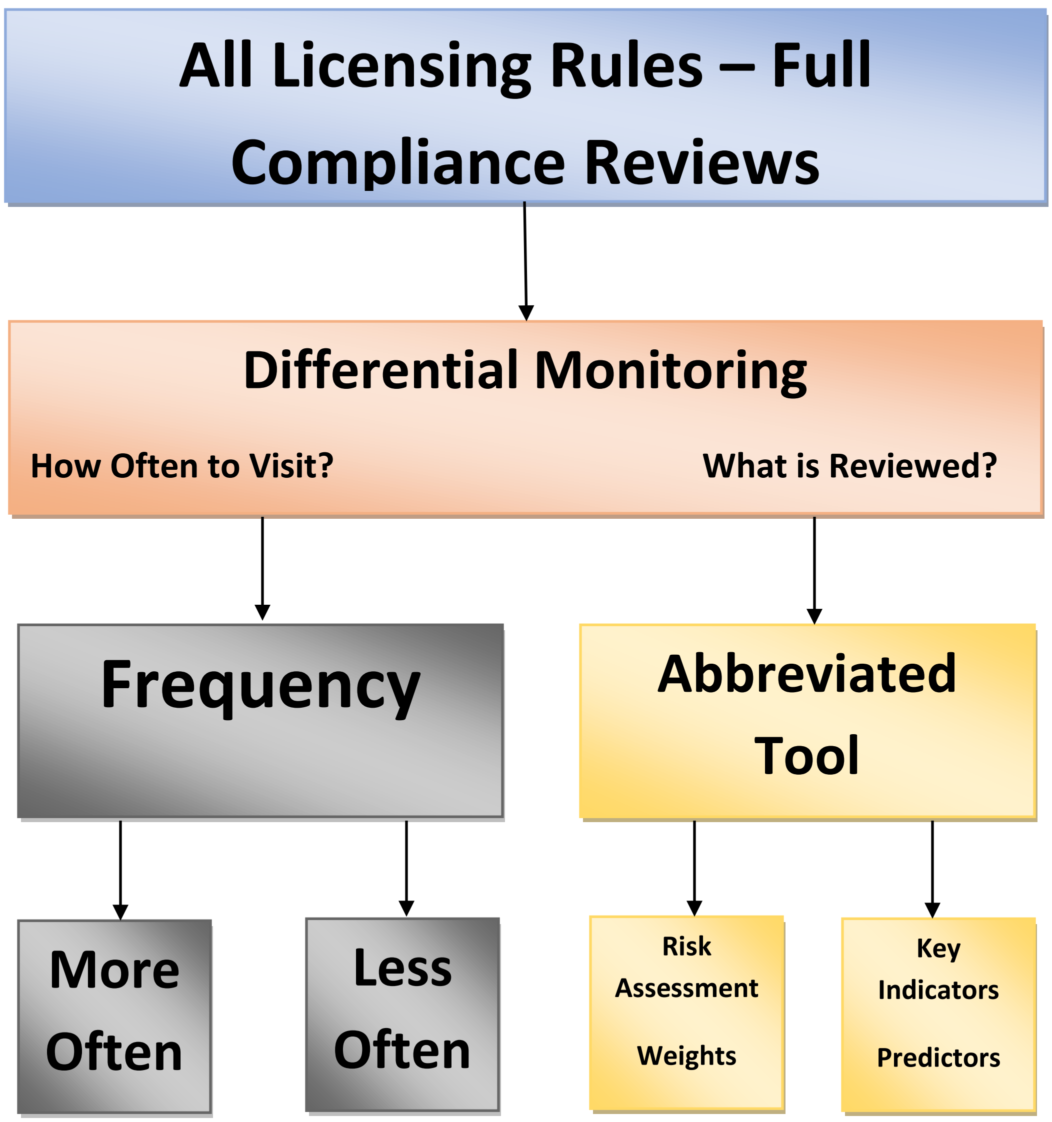
**CI x PQ => RA + KI => DM +** *PD => CO*

**Definitions of Key Elements:**

**PC** = Program Compliance/Licensing (Health and Safety) (***Caring for Our Children***)
**PQ =** QRIS/Accreditation/Caregiver/Child Interactions/Classroom Environment Quality (***ERS/CLASS/PAS/BAS***)
**RA** = Risk Assessment, (High Risk Rules) (***Stepping Stones***)
**KI** = Key Indicators (Predictor Rules***) (13 Key Indicators of Quality Child Care***)
**DM** = Differential Monitoring (How often to visit and what to review)
*PD = Professional Development/Technical Assistance/Training (Not pictured but part of Model)*
*CO = Child Outcomes (Not pictured but part of Model)*



## Appendix – Figure 6 - Licensing Rules, Compliance Reviews, Differential Monitoring, Abbreviated Tools, Risk Assessment, and Key Indicators



## Appendix -- Figure 7 - Phi Coefficients for the Specific Key Indicators

***Family Child Care Homes:***

| Rule Numbers | Phi | Content |
|---|---|---|
| 406.8a1 | .34 | First Aid Kit |
| 406.8a18 | .38 | Emergency Plan |
| 406.8a23 | .36 | Fire Inspection |
| 406.8a24 | .35 | Log of Home Inspections |
| 406.9a | .34 | Background Checks |
| 406.9t | .38 | Caregiver Training |
| 406.12b3 | .34 | Birth Certificate |
| 40612h | .36 | Agreement regarding Pick Up |
| 406.14c2 | .41 | TB Test |
| 406.14c3 | .53 | Lead Poisoning Screening |
| 406.14c4 | .34 | Immunizations |

***Group Child Care Homes:***

| Rule Numbers | Phi | Content |
|---|---|---|
| 408.35f | .28 | Communicable Diseases |
| 408.45f | .31 | Caregiver Training |
| 408.60j | .33 | Agreement Pick Up Policy |
| 408.70a1 | .29 | Medical Records |
| 408.70a2 | .55 | TB Test |
| 408.70a3 | .51 | Lead Poisoning Screening |
| 408.70a4 | .35 | Immunizations |
| 408.120a1 | .37 | Written Application Admission for Each Child |

***Child Care Centers:***

| Rule Numbers | Phi | Content |
|---|---|---|
| 407.100f | .35 | Staff Physical |
| 407.120a1 | .32 | CFS-508 Form |
| 407.120a3 | .41 | Three Written Character References |
| 407.120a4 | .34 | Proof of Educational Achievement |
| 407.250d | .34 | Written Standards Given to Parents |
| 407.260f | .32 | Pick Up Policy |
| 407.270a | .32 | Discipline Policy |
| 407.310a | .44 | Medical Report for Each Child |
| 407.380b | .34 | Equipment Meets Standard Requirements |

# Oregon DMLMA, Risk Assessment, & Key Indicator Blueprint Report

**Richard Fiene, Ph.D.**

**September 30, 2013**

**ABSTRACT**

This report will provide a blueprint for Oregon's Early Care and Education/Child Care program monitoring system in developing a Differential Program Monitoring, Risk Assessment, and Key Indicator approach to help streamline their present licensing process. The report will be organized into the following major headings: an introduction to the differential monitoring methodology; how key indicators and risk assessment fit into the larger program monitoring of early care and education programs; how key indicators and risk assessment will be applied to Oregon's system in particular; the technical aspects of differential monitoring, risk assessment and key indicator methodology, the sample to be drawn from the population, potential results from the analyses; a timeline for this developmental effort; and potential cost savings from the approach.

## INTRODUCTION

The Risk Assessment, Key Indicator, and Differential Program Monitoring Methodologies were developed to help streamline the program monitoring of early care and education programs. It was first applied in child care licensing (Fiene & Nixon, 1985) but has been used in many other service types, such as: Head Start Performance Standards (Fiene, 2013a), National Accreditation (Fiene, 1996), and child and adult residential programs (Kroh & Melusky, 2010). The methodologies are based upon statistical protocols that have been developed in the tests and measurements literature in which an abbreviated set of items is used to statistically predict as if the full test was applied. This methodology has been used in regulatory analysis and more recently has been proposed for use in Quality Rating and Improvement Systems (QRIS) (Fiene, 2013b).

## DIFFERENTIAL PROGRAM MONITORING

Risk Assessment and Key Indicators are important components of differential program monitoring which employs an abbreviated review rather than a comprehensive or full review of a program. It is one of several key elements that have been identified in the research literature to help improve the cost effectiveness and efficiency of the program monitoring of early care and education programs (Fiene, 2013b, c)(See the Appendix). A recent addition to differential monitoring are QRIS – Quality Rating and Improvement Systems. Key indicators have a long history of development within the licensing literature (Fiene & Kroh, 2000) but have only recently been proposed to be used with QRIS. This proposed blueprint is to assist Oregon to develop a fully functional differential program monitoring, risk assessment, and key indicator approach to their child care licensing system and then determine the feasibility of using the these approaches with its QRIS system.

The other key elements of the differential program monitoring approach are the following: program compliance/licensing which is generally a state's health and safety rules/regulations that govern child care. At the national level this would be *Caring for Our Children: National Performance Standards for Health and Safety in Child Care (2012).* The program quality key element is generally represented by the state's QRIS. At the national level it is represented by accreditation, such as NAEYC, NECPA, or NAFCC. The key indicator element is represented by the state's statistical predictor rules/regulations drawn from their comprehensive set of health and safety rules/regulations that govern child care. At the national level, an example is the *13 Indicator of Quality Child Care (2002).* This element can also represent a state's statistical predictor QRIS standards drawn from the comprehensive set of QRIS standards. The purpose of this Blueprint Report is to develop these statistically predictor standards first for Oregon's child care licensing system and explore the possibility of expanding this to their QRIS system. The last key element to be addressed in this report is the risk assessment key element in which these are the high risk rules/regulations that place children at greatest risk of mortality or morbidity. At the national level, an example is *Stepping Stones to Caring for Our Children (2013).* These are generally determined via a weighting system in licensing or a point system with QRIS.

## KEY INDICATORS APPLIED TO OREGON'S CHILD CARE LICENSING SYSTEM

Oregon's licensing and QRIS systems are very similar to many other states' licensing and QRIS systems so that the methodologies employed in the past for developing risk assessment and key indicators will be employed in this blueprint. There are some significant challenges because of the psychometric properties of licensing data because of the severe skewness and kurtosis present in state data systems.  These challenges will be addressed later in this blueprint in how to deal skewness and kurtosis.

The risk assessment and key indicators can eventually be tied to the professional development/training/technical assistance system to link resources to specific needs of the programs.  It also has the capability of tying them to an early learning benchmarking and child outcomes at some point in the future.  This would be accomplished in the full implementation of the Differential Monitoring Logic Model and Algorithm (DMLMA©) as depicted in the Appendix.

## TECHNICAL ASPECTS OF THE KEY INDICATOR METHODOLOGY

This section provides the technical and statistical aspects of the key indicator methodology.  It will provide the roadmap in taking the Oregon licensing and QRIS data bases through the necessary steps to generating the respective key indicators.

One of the first steps is to sort the data into high and low groups, generally the highest and lowest ratings can be used for this sorting.  In very large states this is done on a sampling basis which will be described later in the blueprint.  Frequency data will be obtained on those programs in the top level (usually top 20-25%) and the bottom level (usually the bottom 20-25%).  The middle levels are not used for the purposes of these analyses.  These two groups (top level & the bottom level) are then compared to how each program scored on each item within the specific assessment tool (see Figure 1).  An example would be the following:  Item 16 from the ECERS – Encouraging Children to Communicate.  Sort all the providers by the number in the highest group and the lowest.  Then determine how each program scored on item 16, did they get a 5 or higher or a 3 and lower?  Fill in the cells within Figure 1 accordingly (see Figure 2).

| **Figure 1** | ***Providers In Compliance or Top 25%*** | ***Programs Out Of Compliance or Bottom 25%*** | ***Row Total*** |
|---|---|---|---|
| ***Highest level (top 20-25%)*** | ***A*** | ***B*** | ***Y*** |
| ***Lowest level (bottom 20-25%)*** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | ***Grand Total*** |

Figure 2 depicts that all programs that were in the top 25% (5+ on ECERS, Item 16) were also in the highest rating while the bottom 25% (3 or lower on the ECERS, Item 16) were also in the lowest rating. The data depicted in Figure 2 are taken from studies completed in Pennsylvania in 2002 (Fiene, etal) and 2006 (Barnard, Smith, Fiene & Swanson) in which their quality rating and improvement system (QRIS), Keystone STARS, was validated. The reason for selecting this particular item from the ECERS is that it demonstrates a perfect phi coefficient in discriminating between the highest level and the lowest level. Most, if not all, of the licensing items that will attain the threshold levels to become key indicators will not approach this phi coefficient.

| **Figure 2 – Pa. Study (Fiene, etal, 2002).** | ***Providers In Compliance or Top 25%*** | ***Programs Out Of Compliance or Bottom 25%*** | ***Row Total*** |
|---|---|---|---|
| ***Highest Star level in Pa.*** | ***117*** | ***0*** | ***117*** |
| ***Lowest Star level in Pa.*** | **0** | **35** | ***35*** |
| ***Column Total*** | ***117*** | ***35*** | **152** |

Once the data are sorted in the above matrix, the following formula (Figure 3) is used to determine if Item 16 is a key indicator or not by calculating its respective Phi coefficient. Please refer back to Figure 1 for the actual placement within the cells and Figure 2 for the data within the cells. The legend (Figure 4) below the formula shows how the cells are defined.

**Figure 3 – Formula for Phi Coefficient**

$$\phi = (A)(D)-(B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

**Figure 4 – Legend for the Cells within the Phi Coefficient**

***A = High Group + Programs in Compliance on Specific Compliance Measure.***
***B = High Group + Programs out of Compliance on Specific Compliance Measure.***
***C = Low Group + Programs in Compliance on Specific Compliance Measure.***
***D = Low Group + Programs out of Compliance on Specific Compliance Measure.***

***W = Total Number of Programs in Compliance on Specific Compliance Measure.***
***X = Total Number of Programs out of Compliance on Specific Compliance Measure.***
***Y = Total Number of Programs in High Group.***
***Z = Total Number of Programs in Low Group.***

Once the data are run through the formula in Figure 3, the following chart (Figure 5) can be used to make the final determination of including or not including the item as a key indicator. Based upon the chart in Figure 5, it is best to have a Phi Coefficient approaching +1.00 since we are dealing with normally distributed data[1]. This requirement is relaxed with licensing rules & QRIS selected standards only (+.26 and higher) because the data are more skewed but this should not be the case as much with Oregon's Quality Rating and Improvement System (QRIS).

Continuing with the chart in Figure 5, if the Phi Coefficient is between +.25 and -.25, this indicates that the indicator is unpredictable in being able to predict overall compliance with the quality rating assessment tool. Either a false positive in which the indicator appears too often in the low group as being in compliance, or a false negative in which the indicator appears too often in the high group as being out of compliance[2]. This can occur with Phi Coefficients above +.25 but it becomes unlikely as we approach +1.00 although there is always the possibility that other standards/rules/regulations could be found out of compliance (this was demonstrated in a study conducted by the author (Fiene, 2013c) with Head Start programs). Another solution is to increase the number of key indicators to be reviewed but this will cut down on the efficiency which is desirable and the purpose of the key indicators.

The last possible outcome with the Phi Coefficient is if it is between -.26 and -1.00, this indicates that the indicator is a terrible predictor because it is doing just the opposite of the decision we want to make. The indicator would predominantly be in compliance with the low group rather than the high group so it would be statistically predicting overall non-compliance. This is obviously something we do not want to occur.

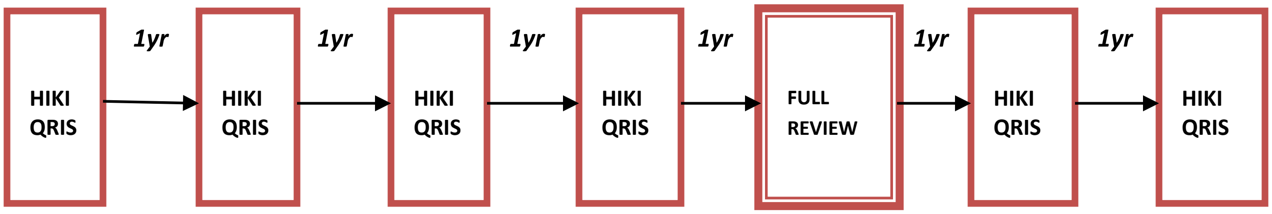
**Figure 5 – Thresholds for the Phi Coefficient (Fiene & Nixon, 1983, 1985)**

| Phi Coefficient Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.26) | Good Predictor | Include |
| (+.25) – (-.25) | Unpredictable | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

The key indicators should then only be used with those programs who have attained the highest rating. It is not intended for those programs that have attained lower ratings. However, even with those programs that have attained the highest rating, every 3-5 years a full, comprehensive review using the full set of rules/standards for licensing and QRIS should occur (see Figure 6 for a graphical depiction). It is intended that a re-validation of the key indicators occur on a periodic basis to make certain that the key indicators have not changed because of differences in compliance history. This is an important and necessary step for the state to engage in to ascertain the overall validity and reliability of the assessment system. Also there should not have been any major changes in the program while the key indicators are being administered, such as the director leaving or a large percentage of teachers leaving or enrollment increasing significantly, or a change in the licensing status of the program.

**Figure 6 - Proposed DMLMA System with Key Indicators (KI)**

***Use of Oregon Key Indicators (ORKI) for Licensing and/or QRIS with a Full Review every 4th Year***




## TECHNICAL ASPECTS OF THE RISK ASSESSMENT METHODOLOGY

The risk assessment methodology is very different from the key indicator methodology in that compliance history data are not utilized but rather a best practice ranking according to risk is used to determine which rules become core rules which have the greatest likelihood to place children at significant risk of morbidity or mortality. This is done by having a group of experts rank order all the rules on a Likert Scale from low risk to high risk of mortality or morbidity that non-compliance with the rule places children at. This is generally done on a 1-10 scale with 1 = low risk; 5 = medium risk; and 10 = high risk (see Figure 6A). The experts selected include but are not limited to licensing staff, policy makers, researchers, child care providers, advocacy groups, parents, and other significant stakeholders who will be impacted by the weighting of the rules.

**Figure 6A – Example of a Likert Scale for Measuring Risk to Children**

**Low Risk** **Medium Risk** **High Risk**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |

Once the data are collected from all the experts, it is averaged for each rule to determine its relative rank in comparison to all the other rules. A significantly high threshold or cut off point is determined so that no more than 5-10% of the rules become core rules. These core rules can then be used in a differential monitoring approach (to be described more fully in the next section) and/or with the key indicators to complete abbreviated reviews of child care programs. It is recommended that such a practice of using both core rules and key indicators be used together because than the state has the benefits of both methodologies in measuring risk and being able to statistically predict overall compliance with a very short list of rules.

**TECHNICAL ASPECTS DIFFERENTIAL MONITORING METHODOLOGY**

There are a couple of other key technical aspects that need to be in place for a differential monitoring system to work. The Differential Monitoring Logic Model and Algorithm (DMLMA©)(see the Appendix) is a 4th generational Early Childhood Program Quality Indicator Model4 (ECPQIM4©) in which the major monitoring systems in early care and education are integrated conceptually so that the overall early care and education system can be assessed and validated. With this new model, it is now possible to compare results obtained from licensing systems, quality rating and improvement systems (QRIS), risk assessment systems, key indicator systems, technical assistance, and child development/early learning outcome systems. The various approaches to validation are interposed within this model and the specific expected correlational thresholds that should be observed amongst the key elements of the model are suggested (see Figure 6B).

**Figure 6B – Inter-Correlational Threshold Matrix**

| | **PQ** | **RA** | **KI** | **DM** | **PD** | **CO** |
|---|---|---|---|---|---|---|
| **CI** | **0.3** | **0.5** | **0.7** | **0.5** | **0.5** | **0.3** |
| **PQ** | | | | **0.3** | **0.3** | **0.3** |
| **RA** | | | **0.5** | **0.5** | **0.5** | **0.3** |
| **KI** | | | | **0.5** | **0.5** | **0.3** |
| **DM** | | | | | **0.5** | |
| **PD** | | | | | | **0.3** |

Key Elements (see the Appendix): CI = state or federal standards, usually rules or regulations that measure health and safety - Caring for Our Children or Head Start Performance Standards will be applicable here. PQ = Quality Rating and Improvement Systems (QRIS) standards at the state level; ERS (ECERS, ITERS, FDCRS), CLASS, or CDPES (Fiene, 2007). RA = risk assessment tools/systems in which only the most critical rules/standards are measured. Stepping Stones is an example of this approach. KI = key indicators in which only predictor rules/standards are measured. The Thirteen Indicators of Quality Child Care is an example of this approach. DM = differential monitoring decision making in which it is determined if a program is in compliance or not and the number of visits/the number of rules/standards are ascertained from a scoring protocol. PD = technical assistance/training and/or professional development system which provides targeted assistance to the program based upon the DM results. CO = child outcomes which assesses how well the children are developing which is the ultimate goal of the system.

Once the above key elements are in place, it is then possible to look at the relationships amongst them to determine if the system is operating as it was intended. This is done through a validation of the overall system and assessing the inter-correlations (Table 6B) to determine that the DM system is improving the health, safety, program quality and ultimately the overall development of the children it serves.

Oregon should use the following plan to implement the above approach:

STATE AGENCY PLAN (These Steps can be viewed as an overall plan as outlined in Zellman & Fiene (2012):

The first step in utilizing the DMLMA for a state is to take a close look at its Comprehensive Licensing Tool (CI) that it uses to collect violation data on all rules with all facilities in its respective state. If the state does not utilize a tool or checklist or does not review all violation data than it needs to consider these changes because the DMLMA is based upon an Instrument Based Program Monitoring System (IPM) which utilizes tools/checklists to collect data on all rules.

The second step for the state is to compare their state's rules with the National Health and Safety Performance Standards (Caring for Our Children) to determine the overlap and coverage between the two. This is the first approach to validation which involves Standards review (Zellman & Fiene, 2012).

The third step for the state if it utilizes a Risk Assessment (RA) tool is to assess the relationship between this tool and Stepping Stones to determine the overlap and coverage between the two. This is a continuation of the first approach to validation which involves Standards review (Zellman & Fiene, 2012).

The fourth step for the state is to compare the results from the CI with the RA tools. This step is the second approach to validation which involves Measures (Zellman & Fiene, 2012). The correlation between CI and RA should be at the .50 level or higher (.50+)(see Figure 6B).

In the fifth step, if a state is fortunate enough to have a QRIS – Quality Rating and Improvement System in place and has sufficient program quality (PQ) data available then they will have the ability to compare results from their CI tool with their PQ tool and validate outputs by determining the relationship between compliance with health and safety rules (CI) and program quality (PQ) measures, such as the ERS's, CLASS, CDPES, etc… This is a very important step because very few empirical demonstrations appear in the research literature regarding this relationship. This step is the third approach to validation which involves Outputs (Zellman & Fiene, 2012). It would be expected that lower correlations (.30+) would be found between CI and PQ because these tools are measuring different aspects of quality such as health & safety versus caregiver-child interactions or overall classroom quality.

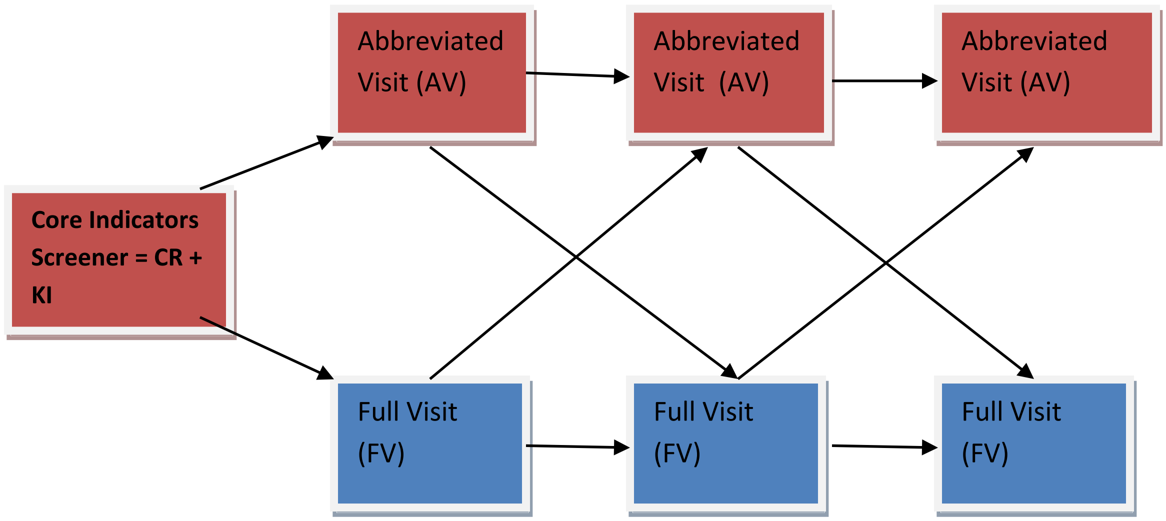
The sixth step is for the state to generate a Key Indicator (KI) tool from the CI data base. Please see Fiene & Nixon (1985) and Fiene & Kroh (2000) for a detailed explanation of the methodology for generating a KI tool. This step is also part of the second approach to validation which involves Measures. The correlation between the CI and KI should be very high (.70+) because the KI is a subset of predictor rules taken from the CI data base. If a state did not want to use the KI methodology, a direct comparison could be drawn from The Thirteen Indicators of Quality Child Care (Fiene, 2002).

The seventh step for the state is to use the RA and KI tools together to determine overall compliance of facilities and how often and which rules will be monitored for future visits. This is the basic component of a Differential Monitoring (DM) approach and continues the second approach to validation (Measures). Also, this step should drive decisions within the technical assistance/training/professional development (PD) system in what resources are allocated to a particular facility. It would be expected that moderate correlations (.50+) would be found amongst RA, KI, DM, and PD.

The eighth and final step for the state is to compare the results from the various monitoring tools (CI, PQ, RA, KI) with any child development outcome (CO) data they collect. This is a relatively new area and few, if any, states at this point have this capability on a large scale. However, as Early Learning Networks and Standards are developed, this will become more common place. This step is the forth approach to validation which involves Outcomes (Zellman & Fiene, 2012). The correlations between CI, PQ, RA, KI and CO will be on the lower end (.30+) because there are so many other variables that impact children's development other than child care facilities.

The last step is to present a logic model which depicts how a differential monitoring system could potentially be actually used in Oregon (see Figure 6C).

**Figure 6C – Logic Model for Compliance Decisions**




**Compliance Decisions:**

***Core Indicators*** *= Core Rules + Key Indicators – this becomes a screening tool to determine if a program receives a AV or FV visit.*
***Core Indicators (100%)*** *= the next visit is a Abbreviated Visit.. Every 3-4 years a Full Licensing Visit is conducted.*
***Core Indicators (not 100%)*** *= The next visit is a Full Licensing Visit where all rules are reviewed.*
***Compliance*** *= 96%+ with all rules which indicates substantial to full compliance with all rules and 100% with Core Indicators. The next visit is an Abbreviated Visit.*
***Non-compliance*** *= less than 96% with all rules which indicates lower compliance with all rules. The next visit is a Full Visit Study.*

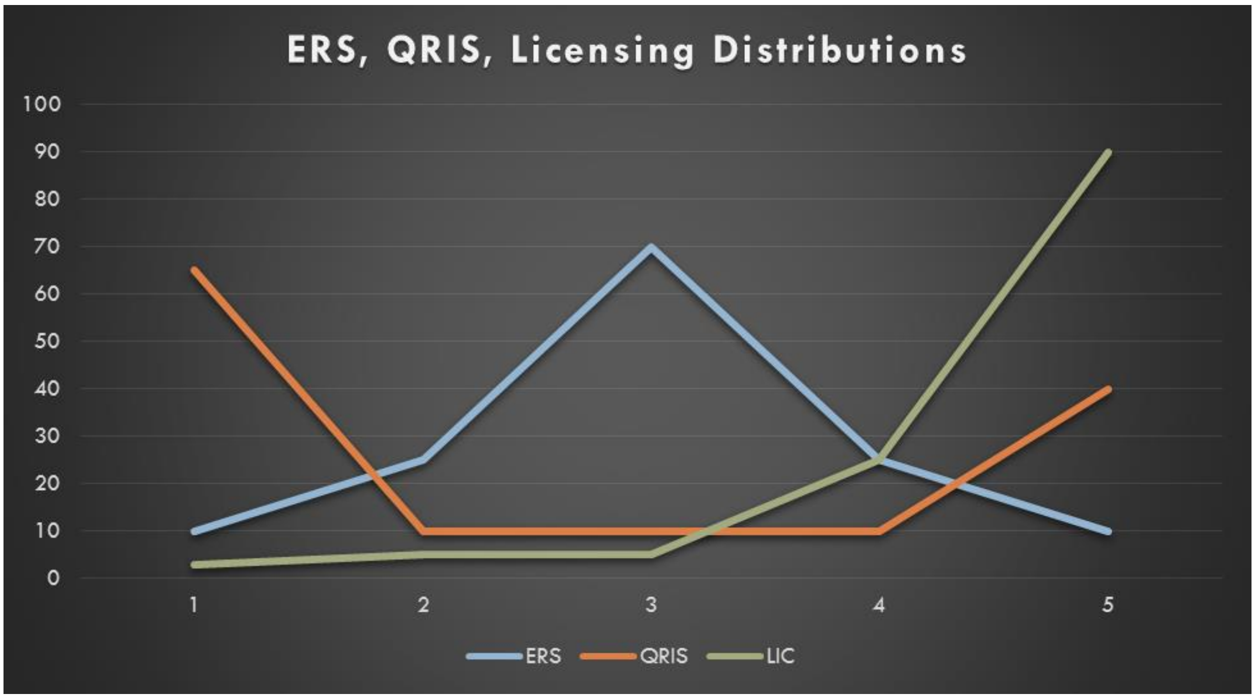
## SAMPLE

Generally a sample is drawn from the population of early care and education facilities in respective states. Oregon will not be any different because of the size of the overall child care program. A random sample will be selected that represents the state population of child care programs. This will be determined by the number of programs, how the programs are distributed throughout the state, the size of the programs, the type of programs, etc… This will need to be determined once the actual implementation of this blueprint report is started. The author of this report can assist Oregon staff in how best to select the sample of programs.

## POTENTIAL CHALLENGES

As mentioned earlier, the measurement issues with licensing data will provide challenges because of their data distributions. In the past when key indicators have been generated with licensing data which are highly skewed, dichotomization of the data is regularly done[3]. Generally dichotomization of data should not be done with normally distributed data[4]; however, in this case with QRIS systems, it is appropriate to do so since the data lend themselves to being sorted into discrete categories, such as rating levels.  The dichotomization will compare the lowest rating level with the highest rating level in order to generate the key indicators.

**Figure 7 – Data Distribution Comparisons of ERS, QRIS, and Licensing Data**




## TIMELINE

As soon as all early care and education programs have gone through their assessment phase, it will be possible to do the calculations to determine the Phi Coefficients and generate the key indicators.  I am guessing that this should not take any longer than 1 year but could be completed in a much shorter period of time if the assessments on individual programs could be moved up (see Figure 8).  The analytical phase should take no longer than a month with an additional month to write up the report.  A face to face presentation of the analyses could be done after these two months.

The timeline presented in Figure 8 can be adjusted to the specific needs for the Oregon system. The timeline is based upon previous projects and the average time to generate risk assessment core rules and key indicators. Another consideration or task is the development of the policies and procedures to be developed and implemented regarding the use of key indicators. This was not specifically listed on the timeline because it is something that is generally developed throughout the project with feedback from all the stakeholders who will be impacted by the use of this new approach to assessment and monitoring.

**Figure 8 - OREGON DMLMA PROJECT TIMELINE**

| TASK | MONTHS | | | | | | |
|---|---|---|---|---|---|---|---|
| **Collect Data** | M1-M3 | | | | | | |
| **Sort Data** | | M2-3 | | | | | |
| **Run Analyses** | | | M3-5 | | | | |
| **Generate KI/RA** | | | | M6 | | | |
| **Train on KI/RA** | | | | | M6-7 | | |
| **KI/RA Reliable** | | | | | | M7-9 | |
| **Implementation** | | | | | | | M10-12 |

**Legend:**
**KI – Key Indicators**
**RA – Risk Assessment**
**Collect Data** – identify participant programs via sampling for KI and the stakeholders for RA.
**Sort Data** – KI - the individual programs are sorted into high and low groups representing the top 25% and the bottom 25% of programs as they have scored on the respective rules/standards.
**Run Analyses** – KI - each individual item within each of the assessment tools for every program will be compared to the sorting process of the high and low groups. RA – aggregate data into means for each rule, rank order the rules.
**Generate KI/RA** – a 2 x 2 matrix is constructed and the key indicators (KI) are generated from this matrix through the use of a phi coefficient. A final report will be delivered to Oregon executive staff for both KI and RA core indicator rules.
**Training on KI/RA** – all staff who will be using the KI/RA will be trained on its use.
**KI/RA Reliability** – reliability will be established by having two staff go out together and administer the key indicators separately and comparing their results.
**Implementation** – once reliability has been established, full implementation will begin.

## COST SAVINGS

Again based upon previous studies most recently completed in California in 2010 (http://www.myccl.ca.gov/res/docs/12022010HandoutStakeholderMeeting.pdf), time savings of 50% have been attained by using a key indicator or abbreviated tool in completing assessments. It only makes sense that if an assessment can be completed in one hour rather than 2 – 4 hours that a state will see time savings. It is being assumed that equivalent savings should also be the case with Oregon's licensing/QRIS although this cannot be made certain until the new key indicator or abbreviated tool is actually used for a period of time. Once the new key indicators are used for several months, comparisons could be made to when the full assessments were done.

**CONCLUSION AND NEXT STEPS**

This blueprint report has given the basic parameters to develop a differential monitoring, risk assessment, and key indicator approach to Oregon's Licensing/QRIS systems. By following this blueprint Oregon staff should be able to fully implement the approach. Oregon staff would also need to determine if they have the internal capability for the development of the key indicators or if there will be the need to outsource certain aspects of the development. This will be an important consideration as Oregon moves forward with this project. I have provided two options for your consideration in moving forward.

***Option 1 – Development of System Internally:***

This would require either information systems or research & evaluation staff to analyze the data, generate core key indicator rules, and training of staff. I could provide the necessary consulting services to help the staff work through the methodology. This would probably require at least one face to face meeting with regular monthly conference calls between myself and staff. Discussions of the formatting of data and the types of analyses would be discussed and demonstrated.

***Option 2 – Development of System Externally:***

In this option I could do all the methodological work demonstrating how I would need the data sent to me, the analytical work in generating core key indicator rules, a report detailing the methodology and results. The only thing that Oregon staff would need to do is get the data to me, all other aspects of what is delineated in the timeline in Figure 8 would be completed by me. This would probably require several face to face trips to explain the process, the results, and do training of staff. Once everything was in place, Oregon staff would have a fully implemented system.

If the above options are of interest I can provide detailed budgets for either one or both.

Notes:

1, 4. The reason for pointing out the need to have a higher Phi Coefficient than what has been reported previously (Fiene & Nixon, 1983, 1985) is the fact that the dichotomization of data should only be used with skewed data and not normally distributed data because it will accentuate differences. However, since the purpose of the dichotomization of data is only for sorting into a high and low group, it would appear to be acceptable for this purpose (MacCallun, etal, 2002. On the practice of dichotomization of quantitative variables, *Psychological Methods*, *7*, *1*, 19-40.).

2. These results would show an increase in cells B and C in Figure 1 which is undesirable; it should always be the case where A + D > B + C for key indicators to maintain their predictive validity.

3. The distinction between making decisions with skewed (Licensing) as versus normally distributed (ERS) data is an important one because there is a greater likelihood with skewed data of introducing less than optimal programs into the high group when sorting programmatic data into high and low groups. This then makes it more difficult to identify the best programs. However, because of the distribution with skewed data the same cannot be said with the low group in which case it is relatively easy to identify the problem programs. This is not as much of a concern when the data are more normally distributed in which it is relatively easy to identify both the optimal and problem programs. This is an excellent example of the need of weighting of standards in order to increase the normal distribution of the data.

**REFERENCES AND ADDITIONAL RELATED READINGS REGARDING DMLMA:**


- Barnard, Smith, Fiene, Swanson (2006). Evaluation of Pennsylvania's Keystone STARS Quality Rating and Improvement System, Pittsburgh: Pennsylvania, Office of Child Development.
- Fiene (2013a***)***. A comparison of international child care and US child care using the Child Care Aware – NACCRRA (National Association of Child Care Resource and Referral Agencies) child care benchmarks, *International Journal of Child Care and Education Policy, 7(1),* 1-15.
- Fiene (2013b). *Differential monitoring logic model and algorithm.* Middletown: Pennsylvania, Research Institute for Key Indicators.
- Fiene (2013c). Head Start Key Indicators. Middletown: Pennsylvania, Research Institute for Key Indicators.
- Fiene (2013d). Kansas Child Care Key Indicators. Middletown: Pennsylvania, Research Institute for Key Indicators.
- Fiene (2013e). Validation of Georgia's core rule differential monitoring system. Middletown: Pennsylvania, Research Institute for Key Indicators.
- Fiene (2007). Child Development Program Evaluation & Caregiver Observation Scale, in T Halle (Ed.), *Early Care and Education Quality Measures Compendium*, Washington, D.C.: Child Trends.
- Fiene (2003). Licensing related indicators of quality child care, *Child Care Bulletin*, winter 2002-2003, pps 12-13.
- Fiene (2002a). *Thirteen indicators of quality child care: Research update*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services.
- Fiene (2002b). Improving child care quality through an infant caregiver mentoring project, *Child and Youth Care Forum, 31*(2), 75-83.
- Fiene, Iutcovich, Johnson, & Koppel (1998). Child day care quality linked to opportunities for professional development: An applied community psychology example. *Community Psychologist, 31*(1), 10-11.
- Fiene (1996). Using a statistical-indicator methodology for accreditation, in *NAEYC Accreditation: A Decade of Learning and the Years Ahead*, S. Bredekamp & B. Willer, editors, Washington, D.C.: National Association for the Education of Young Children.
- Fiene (1995). Utilizing a statewide training system to improve child day care quality: The other system in a program quality improvement model. *Child Welfare*, Volume LXXIV, #6, November-December, 1189-1201.

- Fiene (1985). Measuring the effectiveness of regulations, *New England Journal of Human Services, 5*(2), 38-39.
- Fiene (1981). A new tool for day care monitoring introduced by children's consortium, *Evaluation Practice, 1*(2), 10-11.
- Fiene, Greenberg, Bergsten, Carl, Fegley, & Gibbons (2002). *The Pennsylvania early childhood quality settings study*, Harrisburg, Pennsylvania: Governor's Task Force on Early Care and Education.
- Fiene & Kroh (2000). Licensing Measurement and Systems, *NARA Licensing Curriculum*. Washington, D.C.: National Association for Regulatory Administration.
- Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly, 14*(3), 198-214.
- Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators*. Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.
- Kontos & Fiene (1987). Child care quality, compliance with regulations, and children's development: The Pennsylvania Study, in *Quality in Child Care: What Does Research Tell Us?* Phillips, editor, Washington, D.C.: National Association for the Education of Young Children.
- Zellman, G. L. and Fiene, R. (2012). *Validation of Quality Rating and Improvement Systems for Early Care and Education and School-Age Care,* Research-to-Policy, Research-to-Practice Brief OPRE 2012. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services

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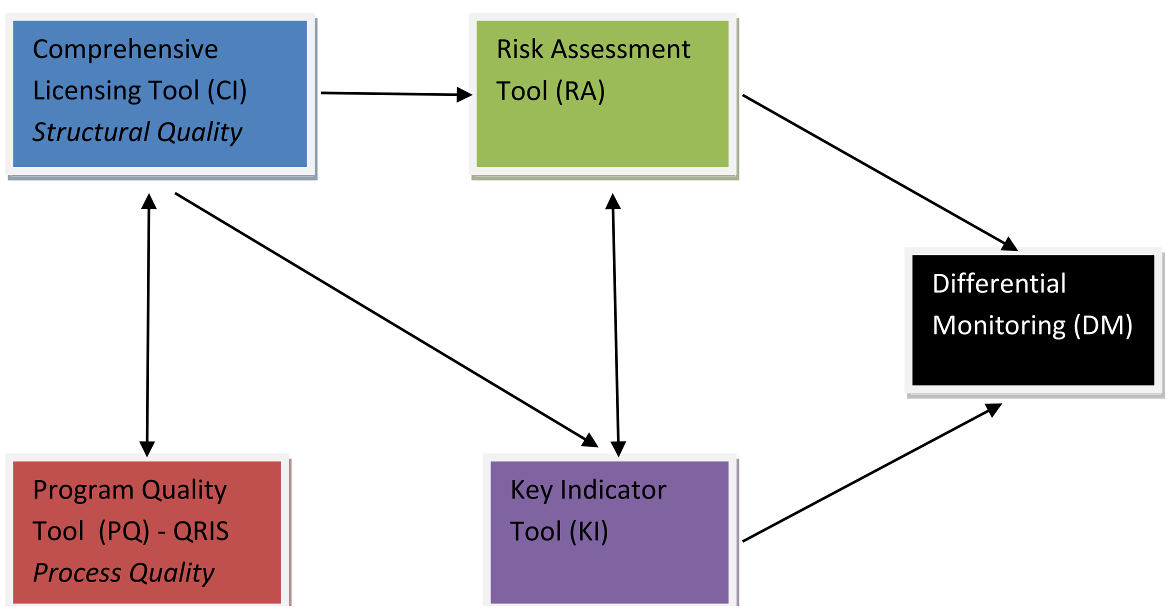
# Appendix

**DIFFERENTIAL MONITORING LOGIC MODEL & ALGORITHM (DMLMA©) (Fiene, 2012): A 4th Generation ECPQIM – Early Childhood Program Quality Indicator Model**

**CI x PQ => RA + KI => DM +** *PD => CO*

**Definitions of Key Elements:**

**PC** = Program Compliance/Licensing (Health and Safety) (***Caring for Our Children***)
**PQ =** QRIS/Accreditation/Caregiver/Child Interactions/Classroom Environment Quality (***ERS/CLASS/PAS/BAS***)
**RA** = Risk Assessment, (High Risk Rules) (***Stepping Stones***)
**KI** = Key Indicators (Predictor Rules***) (13 Key Indicators of Quality Child Care***)
**DM** = Differential Monitoring (How often to visit and what to review)
*PD = Professional Development/Technical Assistance/Training (Not pictured but part of Model)*
*CO = Child Outcomes (Not pictured but part of Model)*



# OREGON'S *STEPPING STONES*[1] RISK FACTORS ANALYSIS

The purpose of this analysis is to provide Oregon OCC with a basic risk factor analysis comparing its child care center rules to ***Stepping Stones (SS)*** standards. This analysis will delineate, based upon ***Stepping Stones'*** major content areas (chapters from ***Caring for our Children (CFOC)***), where there may be gaps in their child care center rules.

This analysis is a summary look at the comparison between ***Stepping Stones*** and Oregon's Rules; it is now intended to be an in-depth crosswalk between the two sets of standards and rules. In order to do that type of analysis, ***Fiene's Stepping Stones to Validate State Rules Template*** (2013) is the suggested source to use.

Table 1 provides the comparisons between ***Stepping Stones*** and the Oregon Child Care Center Rules in which a search of the rules was done to determine if the specific ***SS*** standard was present or not. Every time the search contained a match, it was recorded as a "1". When there was no match, it was recorded as a "0".

**Table 1 – Comparison of *Stepping Stones (SS)* Standards and Oregon Child Care Center Rules**

| SS | RULES | PERCENT | CONTENT AREA/RISK FACTOR |
|---|---|---|---|
| 14 | 11 | 79 | STAFFING |
| 9 | 5 | 56 | PROGRAM ACTIVITIES FOR HEALTHY DEVELOPMENT |
| 25 | 16 | 64 | HEALTH PROMOTION/PROTECTION |
| 13 | 10 | 77 | NUTRITION AND FOOD SERVICE |
| 20 | 12 | 60 | FACILITIES, SUPPLIES, EQUIPMENT, ENVIRON HEALTH |
| 21 | 7 | 33 | PLAY AREAS/PLAYGROUNDS AND TRANSPORTATION |
| 10 | 1 | 10 | INFECTIOUS DISEASES |
| 10 | 7 | 70 | POLICIES |
| 122 | 69 | 56.125 | TOTAL |

**Legend for Table 1:**

***Nominal scaling to determine if the Oregon CCC Rules have any reference to the specific SS3 Standard.***

***It is scored 1/0 where 1 = Present and 0 = Absent. Percent is the total number of "1". Higher the percent the better.***

**SS = STEPPING STONES STANDARDS**

**RULES = OREGON CHILD CARE CENTER RULES**

**PERCENT = RULES/SS**

**CONTENT = RISK FACTOR/SS/CFOC CHAPTER**

This comparison was completed on the major chapter headings in ***Stepping Stones*** and ***Caring for our Children*** as delineated in the Content/Risk Factor Column in Table 1. The following table (Table 2) provides the detail of the contents of each content area/risk factor.

**Table 2 – Major Content/Risk Factor Areas (1-8) and Specific Content for Each Area**

| | |
|---|---|
| 1. STAFFING | A. CHILD:STAFF RATIO AND GROUP SIZE<br>B. RECRUITMENT AND BACKGROUND SCREENING<br>C. DIRECTOR'S QUALIFICATIONS<br>D. TEACHER'S QUALIFICATIONS<br>E. PRE-SERVICE TRAINING<br>F. ORIENTATION TRAINING<br>G. FIRST AID AND CPR TRAINING<br>H. STAFF HEALTH |
| 2. PROGRAM ACTIVITIES FOR HEALTHY DEVELOPMENT | A. PROGRAM ACTIVITIES FOR INFANTS, TODDLERS, PRESCHOOLERS, AND SCHOOL AGE CHILDREN<br>B. SUPERVISION AND DISCIPLINE<br>C. HEALTH INFORMATION SHARING<br>D. HEALTH EDUCATION FOR CHILDREN<br>E. HEALTH EDUCATION FOR STAFF<br>F. HEALTH EDUCATION FOR PARENTS |
| 3. HEALTH PROMOTION AND PROTECTION | A. DAILY HEALTH CHECK<br>B. ROUTINE HEALTH SUPERVISION<br>C. PHYSICAL ACTIVITY AND LIMITING SCREEN TIME<br>D. SAFE SLEEP<br>E. ORAL HEALTH<br>F. DIAPERING AND CHANGING SOILED CLOTHING<br>G. HAND HYGIENE<br>H. EXPOSURE TO BODY FLUIDS<br>I. EMERGENCY PROCEDURES<br>J. CHILD ABUSE AND NEGLECT<br>K. INCLUSION/EXCLUSION DUE TO ILLNESS<br>L. CARING FOR CHILDREN WHO ARE ILL<br>M. MEDICATIONS |
| 4. NUTRITION AND FOOD SERVICE | A. MEAL SERVICE, SEATING, SUPERVISION<br>B. FOOD BROUGHT FROM HOME<br>C. KITCHEN AND EQUIPMENT<br>D. FOOD SAFETY |

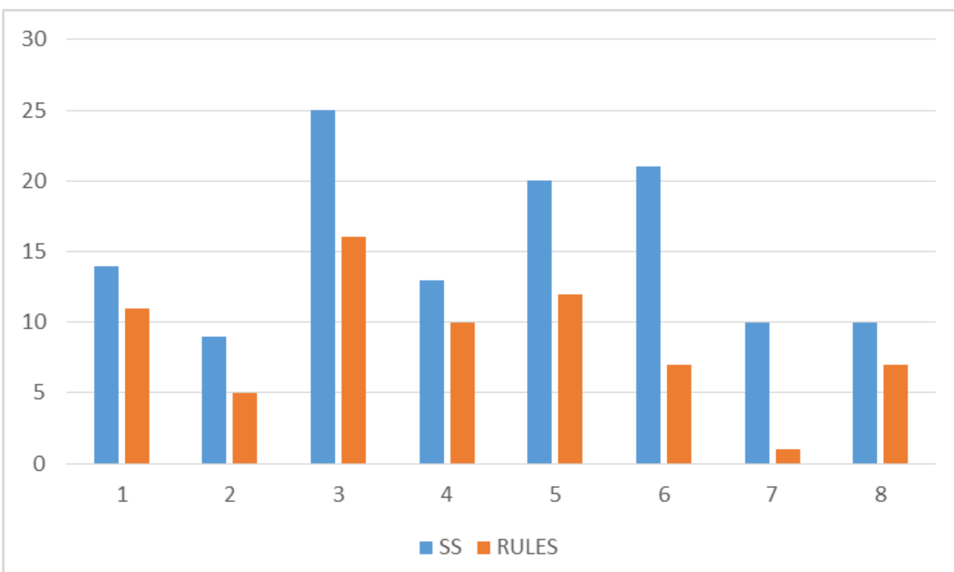
| | |
|---|---|
| | E. MEALS FROM OUTSIDE VENDORS OR CENTRAL KITCHEN<br>F. NUTRITION LEARNING EXPERIENCES FOR CHILDREN<br>G. NUTRITION EDUCATION FOR PARENTS |
| 5. FACILITIES, SUPPLIES, EQUIPMENT, AND ENVIRONMENTAL HEALTH | A. GENERAL LOCATION, LAYOUT, AND CONSTRUCTION OF THE FACILITY<br>B. SPACE PER CHILD<br>C. EXITS<br>D. STEPS AND STAIRS<br>E. EXTERIOR AREAS<br>F. VENTILATION, HEATING, COOLING, AND HOT WATER<br>G. LIGHTING<br>H. NOISE<br>I. ELECTRICAL FIXTURES AND OUTLETS<br>J. FIRE WARNING SYSTEMS<br>K. WATER SUPPLY AND PLUMBING<br>L. SEWAGE AND GARBAGE<br>M. INTEGRATED PEST MANAGEMENT<br>N. PREVENTION AND MANAGEMENT OF TOXIC SUBSTANCES<br>O. TOILET AND HANDWASHING AREAS<br>P. DIAPER CHANGING AREAS<br>Q. SLEEP AND REST AREAS |
| 6. PLAY AREAS/PLAYGROUNDS AND TRANSPORTATION | A. PLAYGROUND SIZE AND LOCATION<br>B. USE ZONES AND CLEARANCE REQUIREMENTS<br>C. PLAY AREA AND PLAYGROUND SURFACING<br>D. INSPECTION OF PLAY AREAS AND EQUIPMENT<br>E. ACCESS TO AND SAFETY AROUND BODIES OF WATER<br>F. POOL EQUIPMENT AND MAINTENANCE<br>G. WATER QUALITY OF POOLS<br>H. TRANSPORTATION SAFETY |
| 7. INFECTIOUS DISEASES | A. HOW INFECTIONS SPREAD<br>B. IMMUNIZATIONS<br>C. RESPIRATORY TRACT INFECTIONS<br>D. ENTERIC (DIARRHEAL) INFECTIONS AND HEPATITIS A VIRUS (HAV)<br>E. SKIN AND MUCOUS MEMBRANE INFECTIONS |

| | |
|---|---|
| | F. BLOODBORNE INFECTIONS<br>G. HERPES VIRUSES<br>H. INTERACTION WITH STATE OR LOCAL HEALTH DEPARTMENTS |
| 8. POLICIES | A. HEALTH POLICIES<br>B. EMERGENCY/SECURITY POLICIES AND PLANS<br>C. TRANSPORTATION POLICIES<br>D. PLAY AREA POLICIES<br>E. FACILITY RECORDS/REPORTS<br>F. CHILD RECORDS<br>G. STAFF RECORDS |

Table 2 provides you with the specific content as it relates to the risk factors. Figures 1 and 2 as well as Table 3 will provide the comparison between ***SS*** standards and Oregon's child care center rules by these content areas/risk factors.

Figure 1 does this comparison by listing for each content area/risk factor the frequency count where there is a match between rules and standards.

**Figure 1 – Comparing Stepping Stones (SS) Standards and Oregon's Child Care Center Rules**




**Legend for Figure 1:**

1 = STAFFING

2 = PROGRAM ACTIVITIES FOR HEALTHY DEVELOPMENT

3 = HEALTH PROMOTION/PROTECTION

4 = NUTRITION AND FOOD SERVICE

5 = FACILITIES, SUPPLIES, EQUIPMENT, ENVIRON HEALTH

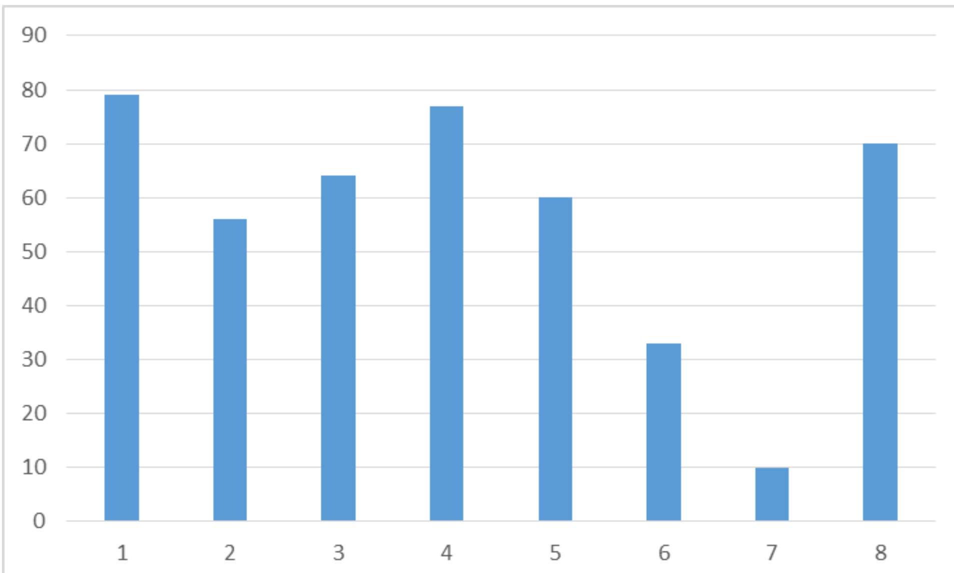
6 = PLAY AREAS/PLAYGROUNDS AND TRANSPORTATION

7 = INFECTIOUS DISEASES

8 = POLICIES

Figure 2 takes the data from Table 1 and Figure 1 and expresses the content areas/risk factors in the form of percents in which the percents represent the number of times the Oregon child care center rules and the ***Stepping Stones*** standards match.

**Figure 2 – Percent of *Stepping Stones* Standards in Oregon's Child Care Center Rules**




**<u>Legend for Figure 1:</u>**

1 = STAFFING

2 = PROGRAM ACTIVITIES FOR HEALTHY DEVELOPMENT

3 = HEALTH PROMOTION/PROTECTION

4 = NUTRITION AND FOOD SERVICE

5 = FACILITIES, SUPPLIES, EQUIPMENT, ENVIRON HEALTH

6 = PLAY AREAS/PLAYGROUNDS AND TRANSPORTATION

7 = INFECTIOUS DISEASES

8 = POLICIES

It is evident from Table 1 and Figures 1 and 2 that the two areas where the greatest gap between the ***Stepping Stones*** standards and Oregon's child care center rules is in the Infectious Diseases and Play Areas/Playgrounds and Transportation content areas/risk factors with a match rate of 10% and 33% respectively. The highest match rates are with the Staffing (79%) and Nutrition & Food Service (77%).

Based upon the above results there are some recommendations to be made where Oregon Office of Child Care staff may want to focus their attention for future rule formulation in the infectious diseases and the play area/playgrounds & transportation content areas.

**Notes:**

1 The reason for using ***Stepping Stones*** rather than ***Caring for our Children*** is that ***Stepping Stones*** are the selected standards from ***CFOC*** that place children at greatest risk of mortality and morbidity if the standards are not complied with.

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# Hawaii QRIS Key Indicator Blueprint Report

**Richard Fiene, Ph.D.**

**August 30, 2013**

**ABSTRACT**

This report will provide a blueprint for Hawaii's QRIS in developing a key indicator approach to help streamline their present assessment process. The report will be organized into the following major headings: an introduction to the key indicator methodology; how key indicators fit into the larger program monitoring of early care and education programs; how key indicators will be applied to QRIS and to Hawaii's QRIS in particular; the technical aspects of the key indicator methodology, the sample to be drawn from the population, although the full population of early care and education programs may be able to be used; potential results from the analyses; a timeline for this developmental effort; and potential cost savings from the approach. This blueprint report will answer all the questions about developing key indicators for QRIS, the what, how, why, when, etc…

## INTRODUCTION

The Key Indicator Methodology was developed to help streamline the program monitoring of early care and education programs. It was first applied in child care licensing (Fiene & Nixon, 1985) but has been used in many other service types, such as: Head Start Performance Standards (Fiene, 2013a), National Accreditation (Fiene, 1996), and child and adult residential programs (Kroh & Melusky, 2010). The methodology is based upon statistical protocols that have been developed in the tests and measurements literature in which an abbreviated set of items is used to statistically predict as if the full test was applied. This methodology has been used in regulatory analysis and more recently has been proposed for use in Quality Rating and Improvement Systems (QRIS) (Fiene, 2013b).

## DIFFERENTIAL PROGRAM MONITORING

Key indicators are an important component of differential program monitoring which employs an abbreviated review rather than a comprehensive or full review of a program. It is one of several key elements that have been identified in the research literature to help improve the cost effectiveness and efficiency of the program monitoring of early care and education programs (Fiene, 2013b, c)(See the Appendix). A recent addition to differential monitoring are QRIS – Quality Rating and Improvement Systems. Key indicators have a long history of development within the licensing literature (Fiene & Kroh, 2000) but have only recently been proposed to be used with QRIS. This proposed blueprint is a first for a state to determine the feasibility of using the key indicator approach with its QRIS system.

The other key elements of the differential program monitoring approach are the following: program compliance/licensing which is generally a state's health and safety rules/regulations that govern child care. At the national level this would be *Caring for Our Children: National Performance Standards for Health and Safety in Child Care (2012).* The program quality key element is generally represented by the state's QRIS. At the national level it is represented by accreditation, such as NAEYC, NECPA, or NAFCC. The key indicator element is represented by the state's statistical predictor rules/regulations drawn from their comprehensive set of health and safety rules/regulations that govern child care. At the national level, an example is the *13 Indicator of Quality Child Care (2002).* This element can also represent a state's statistical predictor QRIS standards drawn from the comprehensive set of QRIS standards. The purpose of this Blueprint Report is to develop these statistically predictor QRIS standards. The last key element to be addressed in this report is the risk assessment key element in which these are the high risk rules/regulations that place children at greatest risk of mortality or morbidity. At the national level, an example is *Stepping Stones to Caring for Our Children (2013).* These are generally determined via a weighting system in licensing or a point system with QRIS.

## KEY INDICATORS APPLIED TO HAWAII'S QRIS

Hawaii's QRIS is somewhat unique in that its assessment system is drawn very heavily from off-the-shelf assessment tools, such as the ERS's, CLASS, PAS/BAS in addition to QRIS program standards. This will pose significant challenges because of the psychometric properties of these standardized tools. However, with that said, the key indicator methodology is drawn directly from the tests and measurements research literature in which it is an approach in taking a comprehensive test and reducing it down to a group of statistical predictor items. The key indicator methodology will not alter the scale structure of any of the assessment tools. The purpose of the key indicator methodology is to establish a protocol so that a determination of a full score and the appropriate level can be statistically predicted from a smaller set of items from that respective tool, in Hawaii's QRIS standards, ERS's, CLASS, PAS/BAS, NAEYC, NAFCC.

The key indicators can eventually be tied to the professional development/training/technical assistance system to link resources to specific needs of the programs. It also has the capability of tying them to an early learning benchmarking and child outcomes at some point in the future. This would be accomplished in the full implementation of the Differential Monitoring Logic Model and Algorithm (DMLMA©) as depicted in the Appendix.

## TECHNICAL ASPECTS OF THE KEY INDICATOR METHODOLOGY

This section provides the technical and statistical aspects of the key indicator methodology. It will provide the roadmap in taking the Hawaii QRIS data base through the necessary steps to generating the respective key indicators.

One of the first steps is to sort the data into high and low groups, generally the highest and lowest ratings can be used for this sorting. In very large states this is done on a sampling basis but in Hawaii's case we should be able to use all the programs who participate in the QRIS and not take a sample. Frequency data will be obtained on those programs in the top level (usually top 20-25%) and the bottom level (usually the bottom 20-25%). The middle levels are not used for the purposes of these analyses. These two groups (top level & the bottom level) are then compared to how each program scored on each item within the specific assessment tool (see Figure 1). An example would be the following: Item 16 from the ECERS – Encouraging Children to Communicate. Sort all the providers by the number in the highest group and the lowest. Then determine how each program scored on item 16, did they get a 5 or higher or a 3 and lower? Fill in the cells within Figure 1 accordingly (see Figure 2).

| **Figure 1** | ***Providers In Compliance or Top 25%*** | ***Programs Out Of Compliance or Bottom 25%*** | ***Row Total*** |
|---|---|---|---|
| ***Highest level (top 20-25%)*** | ***A*** | ***B*** | ***Y*** |
| ***Lowest level (bottom 20-25%)*** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | ***Grand Total*** |

Figure 2 depicts that all programs that were in the top 25% (5+ on ECERS, Item 16) were also in the highest rating while the bottom 25% (3 or lower on the ECERS, Item 16) were also in the lowest rating. The data depicted in Figure 2 are taken from studies completed in Pennsylvania in 2002 (Fiene, etal) and 2006 (Barnard, Smith, Fiene & Swanson) in which their quality rating and improvement system (QRIS), Keystone STARS, was validated.

| **Figure 2 – Pa. Study (Fiene, etal, 2002).** | ***Providers In Compliance or Top 25%*** | ***Programs Out Of Compliance or Bottom 25%*** | ***Row Total*** |
|---|---|---|---|
| ***Highest Star level in Pa.*** | ***117*** | ***0*** | ***117*** |
| ***Lowest Star level in Pa.*** | **0** | **35** | ***35*** |
| ***Column Total*** | ***117*** | ***35*** | **152** |

Once the data are sorted in the above matrix, the following formula (Figure 3) is used to determine if Item 16 is a key indicator or not by calculating its respective Phi coefficient. Please refer back to Figure 1 for the actual placement within the cells and Figure 2 for the data within the cells. The legend (Figure 4) below the formula shows how the cells are defined.

**Figure 3 – Formula for Phi Coefficient**

$$\phi = (A)(D) - (B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

**Figure 4 – Legend for the Cells within the Phi Coefficient**

***A = High Group + Programs in Compliance on Specific Compliance Measure.***
***B = High Group + Programs out of Compliance on Specific Compliance Measure.***
***C = Low Group + Programs in Compliance on Specific Compliance Measure.***
***D = Low Group + Programs out of Compliance on Specific Compliance Measure.***

***W = Total Number of Programs in Compliance on Specific Compliance Measure.***
***X = Total Number of Programs out of Compliance on Specific Compliance Measure.***
***Y = Total Number of Programs in High Group.***
***Z = Total Number of Programs in Low Group.***

Once the data are run through the formula in Figure 3, the following chart (Figure 5) can be used to make the final determination of including or not including the item as a key indicator. Based upon the chart in Figure 5, it is best to have a Phi Coefficient approaching +1.00 since we are dealing with normally distributed data[1]. This requirement is relaxed with licensing rules & QRIS selected standards only (+.26 and higher) because the data are more skewed but this should not be the case as much with Hawaii's Quality Rating and Improvement System (QRIS) data because the measures selected in the QRIS are mostly standardized tools with more normally distributed data.

Continuing with the chart in Figure 5, if the Phi Coefficient is between +.25 and -.25, this indicates that the indicator is unpredictable in being able to predict overall compliance with the quality rating assessment tool. Either a false positive in which the indicator appears too often in the low group as being in compliance, or a false negative in which the indicator appears too often in the high group as being out of compliance[2]. This can occur with Phi Coefficients above +.25 but it becomes unlikely as we approach +1.00 although there is always the possibility that other standards/rules/regulations could be found out of compliance (this was demonstrated in a study conducted by the author (Fiene, 2013c) with Head Start programs). Another solution is to increase the number of key indicators to be reviewed but this will cut down on the efficiency which is desirable and the purpose of the key indicators.

The last possible outcome with the Phi Coefficient is if it is between -.26 and -1.00, this indicates that the indicator is a terrible predictor because it is doing just the opposite of the decision we want to make. The indicator would predominantly be in compliance with the low group rather than the high group so it would be statistically predicting overall non-compliance. This is obviously something we do not want to occur.

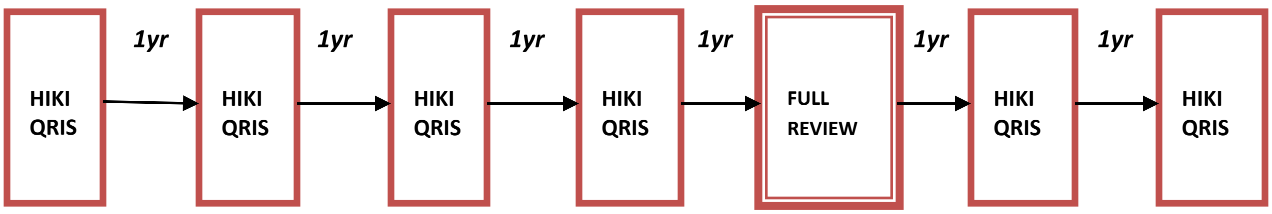
**Figure 5 – Thresholds for the Phi Coefficient (Fiene & Nixon, 1983, 1985)**

| Phi Coefficient Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.26) | Good Predictor | Include |
| (+.25) – (-.25) | Unpredictable | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

The key indicators should then only be used with those programs who have attained the highest rating. It is not intended for those programs that have attained lower ratings. However, even with those programs that have attained the highest rating, every 3-5 years a full, comprehensive review using the full assessment tools and QRIS standards should occur (see Figure 6 for a graphical depiction). It is intended that a re-validation of the key indicators occur on a periodic basis to make certain that the key indicators have not changed because of differences in compliance history. This is an important and necessary step for the state to engage in to ascertain the overall validity and reliability of the assessment system. Also there should not have been any major changes in the program while the key indicators are being administered, such as the director leaving or a large percentage of teachers leaving or enrollment increasing significantly, or a change in the licensing status of the program.

**Figure 6 - Proposed DMLMA System with Key Indicators (KI)**

***Use of Hawaii Key Indicators (HIKI) for QRIS with a Full Review every 4th Year***




## SAMPLE

Generally a sample is drawn from the population of early care and education facilities in the respective state. With this being said, the chances are the full population will be able to be used in Hawaii's case because of the manageable number of facilities. This should be able to be done with centers as well as with homes[2a].

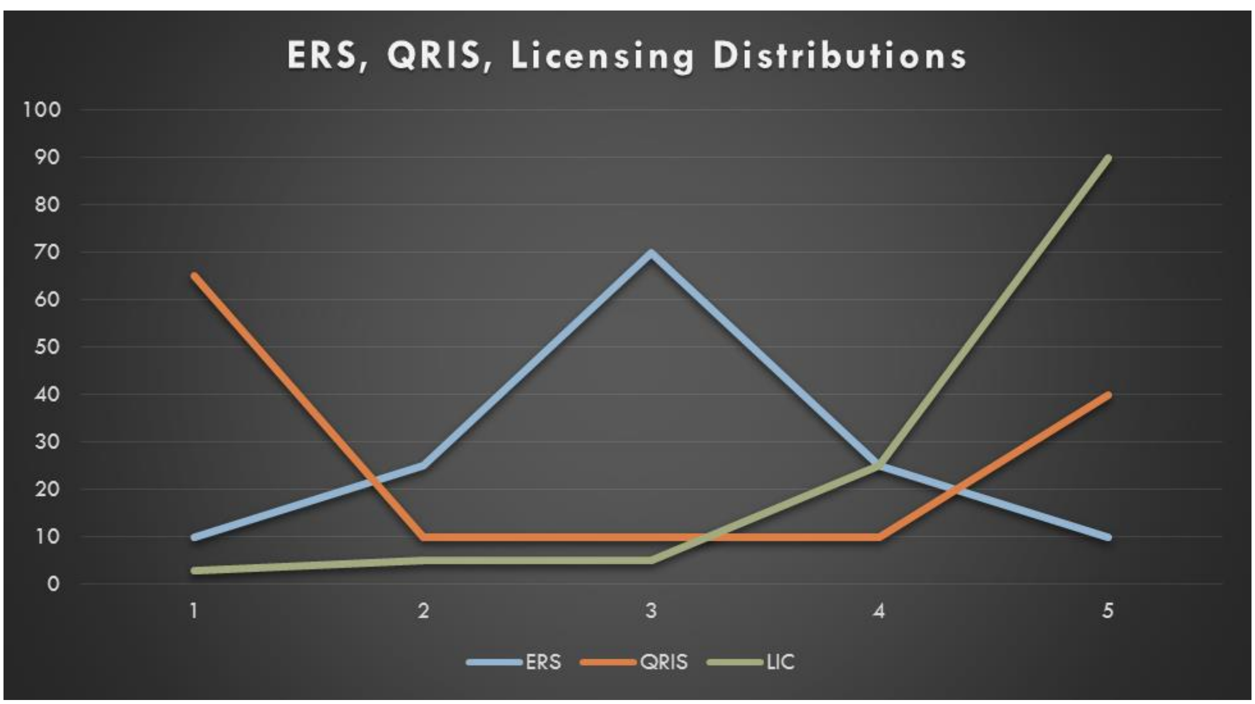
## POTENTIAL RESULTS

The potential results are drawn from previous studies conducted by the author (Fiene, 2013b) in which key indicators were generated for the ECERS-R and FCCERS-R. All the specific items in the ECERS-R and FCCERS-R were run through the Phi Coefficient formula in Figure 3 above after having sorted the data into a high group (5 or higher) and a low group (3 or less) for the overall ECERS-R and FCCERS-R scores. This same procedure will be followed with the Hawaii QRIS but in this case the individual ERS item score will be compared with the respective Star Levels which will be sorted into a high group (top Level) and a low group (bottom Level) in order to determine which individual ERS items become key indicators. This process will be repeated for all ERS items and then extended to CLASS and PAS/BAS items as well as QRIS standards and where appropriate to NAEYC and NAFCC items.

It is estimated from previous studies (Fiene, 2013a; 2013c; 2013d) that approximately 10% of the ERS, CLASS, PAS/BAS, NAEYC, NAFCC items & QRIS standards will become key indicators. If this holds true it will substantially reduce the total number of items to review for QRIS assessments. It is also expected that the Phi Coefficients will be very high at a .90 level or higher because of the dichotomization of the data which should be normally distributed rather than significantly skewed. Also there will be significant redundancy in the data because the rating levels are so much tied to the standardized assessments in that the ERS, CLASS, PAS/BAS, NAEYC, and NAFCC are directly cross-walked to increasing rating levels.

As mentioned earlier, the measurement issues with the various standardized tools will provide challenges because of their data distributions. In the past when key indicators have been generated with licensing data which are highly skewed, dichotomization of the data is regularly done. However, when one looks at Figure 7 it is clear that the standardized assessments are more normally distributed than skewed[3]. Generally dichotomization of data should not be done with normally distributed data[4]; however, in this case with Hawaii's QRIS and how the standardized assessments are used to make decisions regarding rating levels, it is appropriate to do so since the data lend themselves to being sorted into discrete categories, such as rating levels. The dichotomization will compare the lowest rating level with the highest rating level in order to generate the key indicators.

**Figure 7 – Data Distribution Comparisons of ERS, QRIS, and Licensing Data**



## TIMELINE

As soon as all early care and education programs have gone through their assessment phase, it will be possible to do the calculations to determine the Phi Coefficients and generate the key indicators. I am guessing that this should not take any longer than 1 year but could be completed in a much shorter period of time if the assessments on individual programs could be moved up (see Figure 8). The analytical phase should take no longer than a month with an additional month to write up the report. A face to face presentation of the analyses could be done after these two months.

The timeline presented in Figure 8 can be adjusted to the specific needs of Hawaii's QRIS system. The timeline is based upon previous projects and the average time to generate key indicators. Another consideration or task is the development of the policies and procedures to be developed and implemented regarding the use of key indicators. This was not specifically listed on the timeline because it is something that is generally developed throughout the project with feedback from all the stakeholders who will be impacted by the use of this new approach to assessment and monitoring.

**Figure 8 - HAWAII QRIS KEY INDICATOR (KI) PROJECT TIMELINE**

| TASK | MONTHS 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Collect Data | XXXXXXX | | | | | | |
| Sort Data | | XXXXXXX | | | | | |
| Run Analyses | | | XXXXXXX | | | | |
| Generate KI | | | | XXXXXXX | | | |
| Training on KI | | | | | XXXXXXX | | |
| KI Reliability | | | | | | XXXXXXX | |
| Implementation | | | | | | | XXXXXXX |

**Legend:**
**Collect Data** – dependent upon the total number of programs participating it would be determined to collect data on all participants or to complete a sample.
**Sort Data** – the individual programs are sorted into high and low groups representing the top 25% and the bottom 25% of programs as they have scored on the respective assessment tools and standards.

**Run Analyses** – each individual item within each of the assessment tools for every program will be compared to the sorting process of the high and low groups.
**Generate KI** – a 2 x 2 matrix is constructed and the key indicators (KI) are generated from this matrix through the use of a phi coefficient. A final report will be delivered to Hawaii executive staff.
**Training on KI** – all staff who will be using the KI will be trained on its use.
**KI Reliability** – reliability will be established by having two staff go out together and administer the key indicators separately and comparing their results.
**Implementation** – once reliability has been established, full implementation will begin.

## COST SAVINGS

Again based upon previous studies most recently completed in California in 2010 (http://www.myccl.ca.gov/res/docs/12022010HandoutStakeholderMeeting.pdf), time savings of 50% have been attained by using a key indicator or abbreviated tool in completing assessments. It only makes sense that if an assessment can be completed in one hour rather than 2 – 4 hours that a state will see time savings. It is being assumed that equivalent savings should also be the case with Hawaii's QRIS although this cannot be made certain until the new key indicator or abbreviated tool is actually used for a period of time. Once the new key indicators are used for several months, comparisons could be made to when the full assessments were done.

## CONCLUSION AND NEXT STEPS

This blueprint report has given the basic parameters to develop a key indicator approach to Hawaii's QRIS assessment tools. By following this blueprint Hawaii staff should be able to fully implement the approach. Hawaii staff would also need to determine if they have the internal capability for the development of the key indicators or if there will be the need to outsource certain aspects of the development. This will be an important consideration as Hawaii moves forward with this project. I have provided two options for your consideration in moving forward.

***Option 1 – Development of System Internally:***

This would require either information systems or research & evaluation staff to analyze the data, generate key indicators for each assessment tool, and training of staff. I could provide the necessary consulting services to help the staff work through the methodology. This would probably require at least one face to face meeting with regular monthly conference calls between myself and staff. Discussions of the formatting of data and the types of analyses would be discussed and demonstrated.

***Option 2 – Development of System Externally:***

In this option I could do all the methodological work demonstrating how I would need the data sent to me, the analytical work in generating key indicators for each assessment tool, a report detailing the methodology and results. The only thing that Hawaii staff would need to do is get the data to me, all other aspects of what is delineated in the timeline in Figure 8 would be completed by me. This would probably require several face to face trips to explain the process, the results, and do training of staff. Once everything was in place, Hawaii staff would have a fully implemented system.

If the above options are of interest I can provide detailed budgets for either one or both.

Notes:

1, 4. The reason for pointing out the need to have a higher Phi Coefficient than what has been reported previously (Fiene & Nixon, 1983, 1985) is the fact that the dichotomization of data should only be used with skewed data and not normally distributed data because it will accentuate differences. However, since the purpose of the dichotomization of data is only for sorting into a high and low group, it would appear to be acceptable for this purpose (MacCallun, etal, 2002. On the practice of dichotomization of quantitative variables, *Psychological Methods, 7, 1,* 19-40.).

2. These results would show an increase in cells B and C in Figure 1 which is undesirable; it should always be the case where A + D > B + C for key indicators to maintain their predictive validity.

2a. If a sample must be drawn, I can help to provide the guidance in pulling such a sample.

3. The distinction between making decisions with skewed (Licensing) as versus normally distributed (ERS) data is an important one because there is a greater likelihood with skewed data of introducing less than optimal programs into the high group when sorting programmatic data into high and low groups. This then makes it more difficult to identify the best programs. However, because of the distribution with skewed data the same cannot be said with the low group in which case it is relatively easy to identify the problem programs. This is not as much of a concern when the data are more normally distributed in which it is relatively easy to identify both the optimal and problem programs. This is an excellent example of the need of weighting of standards in order to increase the normal distribution of the data.

**REFERENCES AND ADDITIONAL RELATED READINGS REGARDING DMLMA:**


- Barnard, Smith, Fiene, Swanson (2006). Evaluation of Pennsylvania's Keystone STARS Quality Rating and Improvement System, Pittsburgh: Pennsylvania, Office of Child Development.
- Fiene (2013a***).*** A comparison of international child care and US child care using the Child Care Aware – NACCRRA (National Association of Child Care Resource and Referral Agencies) child care benchmarks, *International Journal of Child Care and Education Policy, 7(1),* 1-15.
- Fiene (2013b). *Differential monitoring logic model and algorithm.* Middletown: Pennsylvania, Research Institute for Key Indicators.
- Fiene (2013c). Head Start Key Indicators. Middletown: Pennsylvania, Research Institute for Key Indicators.
- Fiene (2013d). Kansas Child Care Key Indicators. Middletown: Pennsylvania, Research Institute for Key Indicators.
- Fiene (2013e). Validation of Georgia's core rule differential monitoring system. Middletown: Pennsylvania, Research Institute for Key Indicators.
- Fiene (2007). Child Development Program Evaluation & Caregiver Observation Scale, in T Halle (Ed.), *Early Care and Education Quality Measures Compendium*, Washington, D.C.: Child Trends.
- Fiene (2003). Licensing related indicators of quality child care, *Child Care Bulletin*, winter 2002-2003, pps 12-13.
- Fiene (2002a). *Thirteen indicators of quality child care: Research update*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services.
- Fiene (2002b). Improving child care quality through an infant caregiver mentoring project, *Child and Youth Care Forum, 31*(2), 75-83.
- Fiene, Iutcovich, Johnson, & Koppel (1998). Child day care quality linked to opportunities for professional development: An applied community psychology example. *Community Psychologist, 31*(1), 10-11.
- Fiene (1996). Using a statistical-indicator methodology for accreditation, in *NAEYC Accreditation: A Decade of Learning and the Years Ahead*, S. Bredekamp & B. Willer, editors, Washington, D.C.: National Association for the Education of Young Children.
- Fiene (1995). Utilizing a statewide training system to improve child day care quality: The other system in a program quality improvement model. *Child Welfare*, Volume LXXIV, #6, November-December, 1189-1201.

- Fiene (1985). Measuring the effectiveness of regulations, *New England Journal of Human Services, 5*(2), 38-39.

- Fiene (1981). A new tool for day care monitoring introduced by children's consortium, *Evaluation Practice, 1*(2), 10-11.

- Fiene, Greenberg, Bergsten, Carl, Fegley, & Gibbons (2002). *The Pennsylvania early childhood quality settings study*, Harrisburg, Pennsylvania: Governor's Task Force on Early Care and Education.

- Fiene & Kroh (2000). Licensing Measurement and Systems, *NARA Licensing Curriculum*. Washington, D.C.: National Association for Regulatory Administration.

- Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly, 14*(3), 198-214.

- Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators*. Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.

- Kontos & Fiene (1987). Child care quality, compliance with regulations, and children's development: The Pennsylvania Study, in *Quality in Child Care: What Does Research Tell Us?* Phillips, editor, Washington, D.C.: National Association for the Education of Young Children.

- Zellman, G. L. and Fiene, R. (2012). *Validation of Quality Rating and Improvement Systems for Early Care and Education and School-Age Care,* Research-to-Policy, Research-to-Practice Brief OPRE 2012. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services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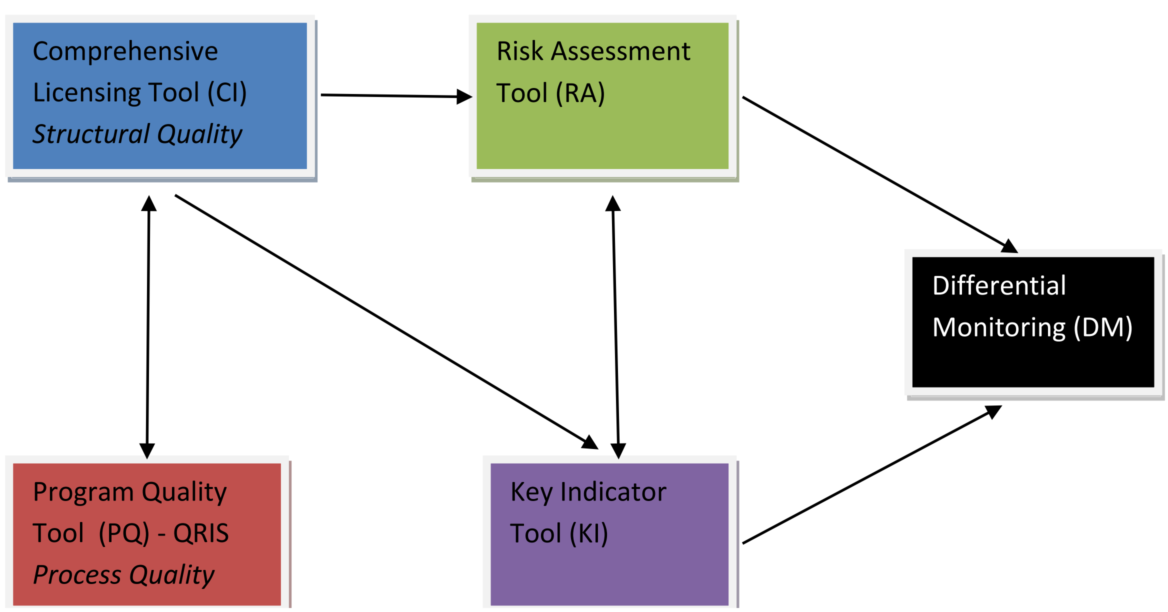
# Appendix

**DIFFERENTIAL MONITORING LOGIC MODEL & ALGORITHM (DMLMA©) (Fiene, 2012): A 4th Generation ECPQIM – Early Childhood Program Quality Indicator Model**

**CI x PQ => RA + KI => DM +** *PD => CO*

**Definitions of Key Elements:**

**PC** = Program Compliance/Licensing (Health and Safety) (***Caring for Our Children***)
**PQ =** QRIS/Accreditation/Caregiver/Child Interactions/Classroom Environment Quality (***ERS/CLASS/PAS/BAS***)
**RA** = Risk Assessment, (High Risk Rules) (***Stepping Stones***)
**KI** = Key Indicators (Predictor Rules***) (13 Key Indicators of Quality Child Care***)
**DM** = Differential Monitoring (How often to visit and what to review)
*PD = Professional Development/Technical Assistance/Training (Not pictured but part of Model)*
*CO = Child Outcomes (Not pictured but part of Model)*



# Wisconsin Department of Children and Youth Services Program Monitoring Options Blueprint Report

**Richard Fiene, Ph.D.**

**May 15, 2014**


## ABSTRACT

This report will provide a blueprint for consideration by Wisconsin's Office of Children and Youth Services regarding options for their program monitoring system. The report will be organized into the following major headings: an introduction to program monitoring; how key indicators and risk assessment fit into the larger program monitoring of human services; how key indicators and risk assessment could be applied to Wisconsin's system in particular; the technical aspects of differential monitoring, risk assessment and key indicator methodology, the sample to be drawn from the population, a timeline for this developmental effort; and potential cost savings from the approach. Many of the examples drawn are from the child care/early care and education field rather than the child welfare/child residential field because most of the best examples are occurring in child care and not child welfare at this point in time. Hopefully, with this blueprint is implemented in children and youth services, we can begin to change this fact.


## INTRODUCTION

An effective and efficient program monitoring system is a goal of every state human service agency in the USA. This has been an issue in the human services for over the past half century as states grapple with increasing caseload sizes with shrinking resources. This report will provide an overview to the topic and several options that the State of Wisconsin can begin to explore related the program monitoring of children and youth services. The Risk Assessment, Key Indicator, and Differential Program Monitoring Methodologies were developed to help streamline the program monitoring of early care and education programs. It was first applied in child care licensing (Fiene & Nixon, 1985) but has been used in many other service types, such as: Head Start Performance Standards (Fiene, 2013a), National Accreditation (Fiene, 1996), and child and adult residential programs (Kroh & Melusky, 2010). The methodologies are based upon statistical protocols that have been developed in the tests and measurements literature in which an abbreviated set of items is used to statistically predict as if the full test was applied. This methodology has been used in regulatory analysis and more recently has been proposed for use in Quality Rating and Improvement Systems (QRIS) (Fiene, 2013b). In reviewing the various states and the research literature, one state did not come to the surface with all the components in place for child welfare/child residential services, therefore a preponderance of examples drawn from the child care/early care and education field are used throughout the report. However, there are many similarities obviously from child care to child welfare with the most obvious being the protection of children and "to do no harm" as the ultimate outcome of services.

**DIFFERENTIAL PROGRAM MONITORING**

Risk Assessment and Key Indicators are important components of differential program monitoring which employs an abbreviated review rather than a comprehensive or full review of a program. It is one of several key elements that have been identified in the research literature to help improve the cost effectiveness and efficiency of the program monitoring of early care and education programs (Fiene, 2013b, c)(See the Appendix for two graphics that depict the key elements). A recent addition to differential monitoring are QRIS – Quality Rating and Improvement Systems. Key indicators have a long history of development within the licensing literature (Fiene & Kroh, 2000) but have not had a long history in child and adult residential services. This proposed blueprint is to assist Wisconsin to develop a fully functional differential program monitoring, risk assessment, and key indicator approach to their licensing system and then determine the cost and resources needed in implementing this approach.

The graphics in the Appendix depict the critical key elements of a differential program monitoring approach. In the first graphic program compliance/licensing is generally a state's health and safety rules/regulations. The program quality key element for children and youth services would generally be represented by the national standards, such as the Child Welfare League of America's Standards. The key indicator element is represented by the state's statistical predictor rules/regulations drawn from their comprehensive set of rules/regulations. The last key element to be addressed in this report is the risk assessment key element in which these are the high risk rules/regulations that place children at greatest risk of mortality or morbidity. All these key elements will be addressed in this report in greater detail outlining the technical aspects of each. The second graphic in the Appendix – Graphic 2 depicts the relationship between licensing rules, compliance reviews, differential monitoring, abbreviated tools, risk assessment and key indicators. As one can see from this graphic it demonstrates the inter-relationships amongst all the program monitoring components.

## KEY INDICATORS APPLIED TO WISCONSIN'S CHILDREN AND YOUTH LICENSING SYSTEM

Before beginning the description of each of the key elements it is important to note that there are some significant challenges because of the psychometric properties of licensing data such as the severe skewness and kurtosis present in state licensing data systems. These challenges will be addressed later in this blueprint in how to deal with skewness and kurtosis[1].

As a footnote, the risk assessment and key indicators can eventually be tied to the professional development/training/technical assistance system to link resources to specific needs of the programs. It also has the capability of tying them to specific child outcomes at some point in the future. This would be accomplished in the full implementation of the Differential Monitoring Logic Model and Algorithm (DMLMA©) as depicted in the Appendix – Graphic 1.

## TECHNICAL ASPECTS OF THE KEY INDICATOR METHODOLOGY

This section provides the technical and statistical aspects of the key indicator methodology. It will provide the roadmap in taking the Wisconsin licensing data base through the necessary steps to generating the respective key indicators.

One of the first steps is to sort the data into high and low groups, generally the highest and lowest ratings can be used for this sorting. In very large states this is done on a sampling basis which will be described later in the blueprint. Frequency data will be obtained on those programs in the top level (usually top 20-25%) and the bottom level (usually the bottom 20-25%). The middle levels are not used for the purposes of these analyses. These two groups (top level & the bottom level) are then compared to how each program scored on each item within the specific assessment tool (see Figure 1). An example is provided in Figure 2 from a previous study conducted by the author (see Figure 2).

| **Figure 1** | ***Providers In Compliance or Top 25%*** | ***Programs Out Of Compliance or Bottom 25%*** | ***Row Total*** |
|---|---|---|---|
| ***Highest level (top 20-25%)*** | ***A*** | ***B*** | ***Y*** |
| ***Lowest level (bottom 20-25%)*** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | ***Grand Total*** |

Figure 2 depicts that all programs that were in the top 25% were also in the highest rating while the bottom 25% were also in the lowest rating. The data depicted in Figure 2 are taken from studies completed in Pennsylvania in 2002 (Fiene, etal) and 2006 (Barnard, Smith, Fiene & Swanson) in which their quality rating and improvement system, Keystone STARS, was validated. The reason for selecting this particular item from the ECERS – Early Childhood Environment Rating Scale is that it demonstrates a perfect phi coefficient in discriminating between the highest level and the lowest level. Most, if not all, of the licensing items that will attain the threshold levels to become key indicators will not approach this phi coefficient.

| **Figure 2 – Pa. Study (Fiene, etal, 2002).** | ***Providers In Compliance or Top 25%*** | ***Programs Out Of Compliance or Bottom 25%*** | ***Row Total*** |
|---|---|---|---|
| ***Highest Star level in Pa.*** | ***117*** | ***0*** | ***117*** |
| ***Lowest Star level in Pa.*** | **0** | **35** | ***35*** |
| ***Column Total*** | ***117*** | ***35*** | **152** |

Once the data are sorted in the above matrix, the following formula (Figure 3) is used to determine if Item 16 is a key indicator or not by calculating its respective Phi coefficient. Please refer back to Figure 1 for the actual placement within the cells and Figure 2 for the data within the cells. The legend (Figure 4) below the formula shows how the cells are defined.

**Figure 3 – Formula for Phi Coefficient**

$$\phi = (A)(D) - (B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

**Figure 4 – Legend for the Cells within the Phi Coefficient**

***A = High Group + Programs in Compliance on Specific Compliance Measure.***
***B = High Group + Programs out of Compliance on Specific Compliance Measure.***
***C = Low Group + Programs in Compliance on Specific Compliance Measure.***
***D = Low Group + Programs out of Compliance on Specific Compliance Measure.***

***W = Total Number of Programs in Compliance on Specific Compliance Measure.***
***X = Total Number of Programs out of Compliance on Specific Compliance Measure.***
***Y = Total Number of Programs in High Group.***
***Z = Total Number of Programs in Low Group.***

Once the data are run through the formula in Figure 3, the following chart (Figure 5) can be used to make the final determination of including or not including the item as a key indicator. Based upon the chart in Figure 5, it is best to have a Phi Coefficient approaching +1.00 if we are dealing with normally distributed data.

Continuing with the chart in Figure 5, if the Phi Coefficient is between +.25 and -.25, this indicates that the indicator is unpredictable in being able to predict overall compliance with the quality rating assessment tool. Either a false positive in which the indicator appears too often in the low group as being in compliance, or a false negative in which the indicator appears too often in the high group as being out of compliance[2]. This can occur with Phi Coefficients above +.25 but it becomes unlikely as we approach +1.00 although there is always the possibility that other standards/rules/regulations could be found out of compliance (this was demonstrated in a study conducted by the author (Fiene, 2013c). Another solution is to increase the number of key indicators to be reviewed but this will cut down on the efficiency which is desirable and the purpose of the key indicators.

The last possible outcome with the Phi Coefficient is if it is between -.26 and -1.00, this indicates that the indicator is a terrible predictor because it is doing just the opposite of the decision we want to make. The indicator would predominantly be in compliance with the low group rather than the high group so it would be statistically predicting overall non-compliance. This is obviously something we do not want to occur.

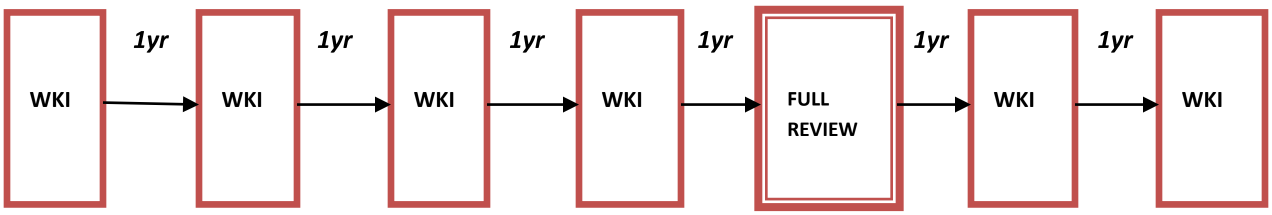
**Figure 5 – Thresholds for the Phi Coefficient (Fiene & Nixon, 1983, 1985)**

| Phi Coefficient Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.26) | Good Predictor | Include |
| (+.25) – (-.25) | Unpredictable | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

The key indicators should then only be used with those programs who have attained the highest rating. It is not intended for those programs that have attained lower ratings. However, even with those programs that have attained the highest rating, every 3-5 years a full, comprehensive review using the full set of rules/standards for licensing should occur (see Figure 6 for a graphical depiction). It is intended that a re-validation of the key indicators occur on a periodic basis to make certain that the key indicators have not changed because of differences in compliance history. This is an important and necessary step for the state to engage in to ascertain the overall validity and reliability of the assessment system. Also there should not have been any major changes in the program while the key indicators are being administered, such as the director/administrator leaving or a large percentage of staff leaving or caseloads increasing significantly, or a change in the licensing status of the program.

**Figure 6 - Proposed DMLMA System with Key Indicators (KI)**

***Use of Wisconsin Key Indicators (WKI) for Licensing with a Full Review every 4th Year***




## TECHNICAL ASPECTS OF THE RISK ASSESSMENT METHODOLOGY

The risk assessment methodology is very different from the key indicator methodology in that compliance history data are not utilized but rather a best practice ranking according to risk is used to determine which rules become core rules which have the greatest likelihood to place children at significant risk of morbidity or mortality. This is done by having a group of experts rank order all the rules on a Likert Scale from low risk to high risk of mortality or morbidity that non-compliance with the rule places children at. This is generally done on a 1-10 scale with 1 = low risk; 5 = medium risk; and 10 = high risk (see Figure 6A). The experts selected include but are not limited to licensing staff, policy makers, researchers, providers, advocacy groups, parents, and other significant stakeholders who will be impacted by the weighting of the rules.

**Figure 6A – Example of a Likert Scale for Measuring Risk to Children**

**Low Risk** **Medium Risk** **High Risk**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |

Once the data are collected from all the experts, it is averaged for each rule to determine its relative rank in comparison to all the other rules. A significantly high threshold or cut off point is determined so that no more than 5-10% of the rules become core rules. These core rules can then be used in a differential monitoring approach (to be described more fully in the next section) and/or with the key indicators to complete abbreviated reviews of child welfare programs. It is recommended that such a practice of using both core rules and key indicators be used together because than the state has the benefits of both methodologies in measuring risk and being able to statistically predict overall compliance with a very short list of rules.

**TECHNICAL ASPECTS DIFFERENTIAL MONITORING METHODOLOGY**

There are a couple of other key technical aspects that need to be in place for a differential monitoring system to work. The Differential Monitoring Logic Model and Algorithm (DMLMA©)[3](see the Appendix) is a 4th generational Early Childhood Program Quality Indicator Model4 (ECPQIM4©) in which the major monitoring systems in early care and education are integrated conceptually so that the overall early care and education system can be assessed and validated. With this new model, it is now possible to compare results obtained from licensing systems, quality assurance systems, risk assessment systems, key indicator systems, technical assistance, and child protection outcome systems. The various approaches to validation are interposed within this model and the specific expected correlational thresholds that should be observed amongst the key elements of the model are suggested (see Figure 6B).

**Figure 6B – Inter-Correlational Threshold Matrix**

| | PQ | RA | KI | DM | PD | CO |
|---|---|---|---|---|---|---|
| **CI** | **0.3** | **0.5** | **0.7** | **0.5** | **0.5** | **0.3** |
| **PQ** | | | | **0.3** | **0.3** | **0.3** |
| **RA** | | | **0.5** | **0.5** | **0.5** | **0.3** |
| **KI** | | | | **0.5** | **0.5** | **0.3** |
| **DM** | | | | | **0.5** | |
| **PD** | | | | | | **0.3** |

Key Elements (see the Appendix): CI = state or federal standards, usually rules or regulations. PQ = CWLA Standards or a Quality Assurance System. RA = risk assessment tools/systems in which only the most critical rules/standards are measured. KI = key indicators in which only predictor rules/standards are measured. DM = differential monitoring decision making in which it is determined if a program is in compliance or not and the number of visits/the number of rules/standards are ascertained from a scoring protocol. PD = technical assistance/training and/or professional development system which provides targeted assistance to the program based upon the DM results. CO = child outcomes which assesses how well the children are protected which is the ultimate goal of the system.

Once the above key elements are in place, it is then possible to look at the relationships amongst them to determine if the system is operating as it was intended. This is done through a validation of the overall system and assessing the inter-correlations (Table 6B) to determine that the DM system is improving the overall protection of the children it serves.

Wisconsin could use the following plan to implement the above approach:

STATE AGENCY PLAN (These Steps can be viewed as an overall plan as outlined in Zellman & Fiene (2012):

The first step in utilizing the DMLMA for a state is to take a close look at its Comprehensive Licensing Tool (CI) that it uses to collect violation data on all rules with all facilities in its respective state. If the state does not utilize a tool or checklist or does not review all violation data than it needs to consider these changes because the DMLMA is based upon an Instrument Based Program Monitoring System (IPM) which utilizes tools/checklists to collect data on all rules.

The second step for the state is to compare their state's rules with the National Standards (such as the CWLA National Standards for Best Practices) to determine the overlap and coverage between the two. This is the first approach to validation which involves Standards review (Zellman & Fiene, 2012).

The third step for the state is to compare the results from the CI with the RA tools. This step is the second approach to validation which involves Measures (Zellman & Fiene, 2012). The correlation between CI and RA should be at the .50 level or higher (.50+)(see Figure 6B).

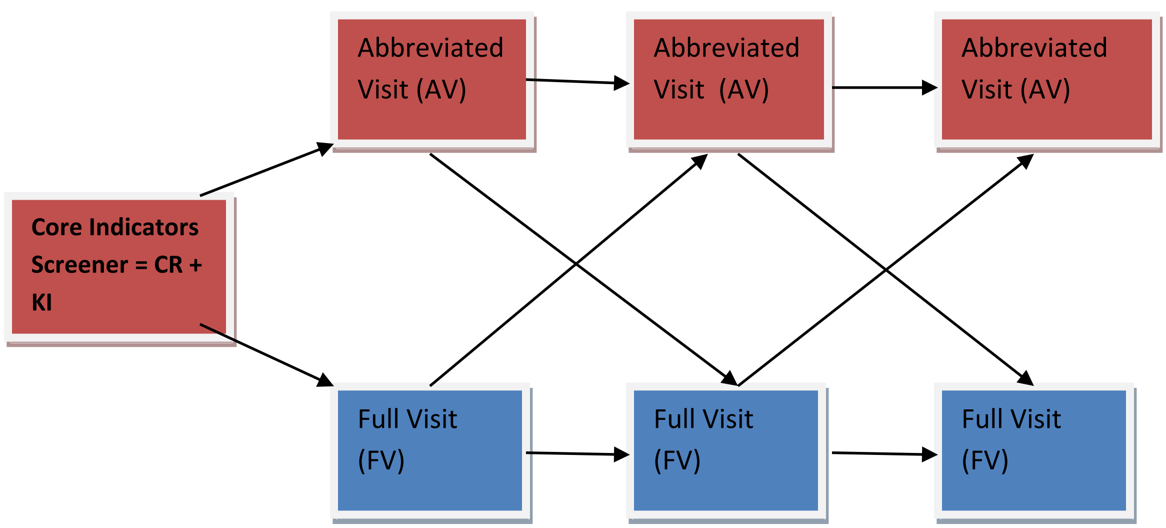
The fourth step is for the state to generate a Key Indicator (KI) tool from the CI data base. Please see Fiene & Nixon (1985) and Fiene & Kroh (2000) for a detailed explanation of the methodology for generating a KI tool. This step is also part of the second approach to validation which involves Measures. The correlation between the CI and KI should be very high (.70+) because the KI is a subset of predictor rules taken from the CI data base.

The fifth step for the state is to use the RA and KI tools together to determine overall compliance of facilities and how often and which rules will be monitored for future visits. This is the basic component of a Differential Monitoring (DM) approach and continues the second approach to validation (Measures). Also, this step should drive decisions within the technical assistance/training/professional development (PD) system in what resources are allocated to a particular facility. It would be expected that moderate correlations (.50+) would be found amongst RA, KI, DM, and PD.

The sixth and final step for the state is to compare the results from the various monitoring tools (CI, PQ, RA, KI) with any child development outcome (CO) data they collect. This is a relatively new area and few, if any, states at this point have this capability on a large scale. This step is the fourth approach to validation which involves Outcomes (Zellman & Fiene, 2012). The correlations between CI, PQ, RA, KI and CO will be on the lower end (.30+) because there are so many other variables that impact the child other than child welfare services.

The last step is to present a logic model which depicts how a differential monitoring system could potentially be actually used in Wisconsin (see Figure 6C).

**Figure 6C – Logic Model for Compliance Decisions**




<u>**Compliance Decisions:**</u>

***Core Indicators*** *= Core Rules + Key Indicators – this becomes a screening tool to determine if a program receives a AV or FV visit.*
***Core Indicators (100%)*** *= the next visit is a Abbreviated Visit.. Every 3-4 years a Full Licensing Visit is conducted.*
***Core Indicators (not 100%)*** *= The next visit is a Full Licensing Visit where all rules are reviewed.*
***Compliance*** *= 96%+ with all rules which indicates substantial to full compliance with all rules and 100% with Core Indicators. The next visit is an Abbreviated Visit.*
***Non-compliance*** *= less than 96% with all rules which indicates lower compliance with all rules. The next visit is a Full Visit Study.*

**SAMPLE**

Generally a sample is drawn from the population of early care and education facilities in respective states. Wisconsin will not be any different because of the size of the overall child welfare program. A random sample will be selected that represents the state population of child welfare programs. This will be determined by the number of programs, how the programs are distributed throughout the state, the size of the programs, the type of programs, etc… This will need to be determined once the actual implementation of this blueprint report is started. The author of this report can assist Wisconsin staff in how best to select the sample of programs.

**TIMELINE**

As soon as all the Wisconsin child welfare/child residential programs have gone through their assessment phase, it will be possible to do the calculations to determine the Phi Coefficients and generate the key indicators. I am guessing that this should not take any longer than 1 year but could be completed in a much shorter period of time if the assessments on individual programs could be moved up (see Figure 7). The analytical phase should take no longer than a month with an additional month to write up the report. A face to face presentation of the analyses could be done after these two months.

The timeline presented in Figure 7 can be adjusted to the specific needs for the Wisconsin system. The timeline is based upon previous projects and the average time to generate risk assessment core rules and key indicators. Another consideration or task is the development of the policies and procedures to be developed and implemented regarding the use of key indicators. This was not specifically listed on the timeline because it is something that is generally developed throughout the project with feedback from all the stakeholders who will be impacted by the use of this new approach to assessment and monitoring.

**Figure 7 - WISCONSIN DMLMA PROJECT TIMELINE**

| TASK | MONTHS | | | | | | |
|---|---|---|---|---|---|---|---|
| **Collect Data** | M1-M3 | | | | | | |
| **Sort Data** | | M2-3 | | | | | |
| **Run Analyses** | | | M3-5 | | | | |
| **Generate KI/RA** | | | | M6 | | | |
| **Train on KI/RA** | | | | | M6-7 | | |
| **KI/RA Reliable** | | | | | | M7-9 | |
| **Implementation** | | | | | | | M10-12 |

**Legend:**

**KI – Key Indicators**
**RA – Risk Assessment**
**Collect Data** – identify participant programs via sampling for KI and the stakeholders for RA.
**Sort Data** – KI - the individual programs are sorted into high and low groups representing the top 25% and the bottom 25% of programs as they have scored on the respective rules/standards.
**Run Analyses** – KI - each individual item within each of the assessment tools for every program will be compared to the sorting process of the high and low groups. RA – aggregate data into means for each rule, rank order the rules.
**Generate KI/RA** – a 2 x 2 matrix is constructed and the key indicators (KI) are generated from this matrix through the use of a phi coefficient. A final report will be delivered to Wisconsin executive staff for both KI and RA core indicator rules.
**Training on KI/RA** – all staff who will be using the KI/RA will be trained on its use.
**KI/RA Reliability** – reliability will be established by having two staff go out together and administer the key indicators separately and comparing their results.
**Implementation** – once reliability has been established, full implementation will begin.

## COST SAVINGS

Again based upon previous studies most recently completed in California in 2010 (http://www.myccl.ca.gov/res/docs/12022010HandoutStakeholderMeeting.pdf), time savings of 50% have been attained by using a key indicator or abbreviated tool in completing assessments. It only makes sense that if an assessment can be completed in one hour rather than 2 – 4 hours that a state will see time savings. It is being assumed that equivalent savings should also be the case with Wisconsin's licensing system although this cannot be made certain until the new key indicator or abbreviated tool is actually used for a period of time. Once the new key indicators are used for several months, comparisons could be made to when the full assessments were done.

## CONCLUSION, OPTIONS, AND RECOMMENDATIONS

This blueprint report has given the basic empirical parameters to develop a differential monitoring, risk assessment, and key indicator approach to Wisconsin's Children and Youth Licensing system[4]. By following this blueprint Wisconsin staff should be able to fully implement the approach. Wisconsin staff would also need to determine if they have the internal capability for the development of the key indicators or if there will be the need to outsource certain aspects of the development. This will be an important consideration as Wisconsin moves forward with this project. I have provided two options for your consideration in moving forward.

***Option 1 – Development of System Internally:***

This would require either information systems or research & evaluation staff to analyze the data, generate core key indicator rules, and training of staff. I could provide the necessary consulting services to help the staff work through the methodology. This would probably require at least one face to face meeting with regular monthly conference calls between myself and staff. Discussions of the formatting of data and the types of analyses would be discussed and demonstrated. The overall cost to develop the system internally with NARA support would be approximately $100,000.

***Option 2 – Development of System Externally:***

In this option I could do all the methodological work demonstrating how I would need the data sent to me, the analytical work in generating core key indicator rules, a report detailing the methodology and results. The only thing that Wisconsin staff would need to do is get the data to me, all other aspects of what is delineated in the timeline in Figure 7 would be completed by me. This would probably require several face to face trips to explain the process, the results, and do training of staff. Once everything was in place, Wisconsin staff would have a fully implemented system. The overall cost to develop the system externally with NARA support would be approximately $300,000.

Whatever option is selected the following **recommendations** are provided if Wisconsin staff want to develop a program monitoring system based upon empirical data:

1) Wisconsin should move forward with enhancing their differential monitoring approach in order to institute potential cost savings and reallocation of resources based upon those cost savings.

2) Develop and implement a key indicator approach based upon the methodology described in this blueprint.

3) Develop and implement a risk assessment approach based upon the methodology described in this blueprint.

4) A staff caseload analysis should be completed based upon ***NARA's Licensing Workload Assessment*** in order to determine the exact number of additional staff needed to fully implement a Differential Monitoring Approach.

Notes:

1. The reason for pointing out the need to have a higher Phi Coefficient than what has been reported previously (Fiene & Nixon, 1983, 1985) is the fact that the dichotomization of data should only be used with skewed data and not normally distributed data because it will accentuate differences. However, since the purpose of the dichotomization of data is only for sorting into a high and low group, it would appear to be acceptable for this purpose (MacCallun, etal, 2002. On the practice of dichotomization of quantitative variables, *Psychological Methods, 7, 1,* 19-40.).

2. These results would show an increase in cells B and C in Figure 1 which is undesirable; it should always be the case where A + D > B + C for key indicators to maintain their predictive validity. The distinction between making decisions with skewed (Licensing) as versus normally distributed (ERS) data is an important one because there is a greater likelihood with skewed data of introducing less than optimal programs into the high group when sorting programmatic data into high and low groups. This then makes it more difficult to identify the best programs. However, because of the distribution with skewed data the same cannot be said with the low group in which case it is relatively easy to identify the problem programs. This is not as much of a concern when the data are more normally distributed in which it is relatively easy to identify both the optimal and problem programs. This is an excellent example of the need of weighting of standards in order to increase the normal distribution of the data.

3. It is important to note that many of the examples are drawn from the child care research literature and not from the child welfare research literature. The reason for this is most of the empirical basis for the development of these methodologies was completed in child care over the past 40 years. It is important for the reader of this report to keep this in mind and to make the necessary translations to the child welfare literature research base. For example, when I describe the national health and safety standards in child care, the reader should be thinking of the CWLA national standards for the various child welfare service types. QRIS systems can translate to child welfare systems that locally have been built upon generic licensing systems. The DMLMA model is a generic model for all human services and not only for child care, so the reader should be able to make the translation from child care to child welfare.

4. There are two publications that are more pertinent to children & youth services and child welfare that I wrote back in the 1980's the Wisconsin staff may be interested in (Fiene & McDonald, (1987), *Instrument Based Program Monitoring and Indicator Checklist for Child Welfare,* and Fiene (1981), *Conceptual Framework for Program Monitoring*).

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**REFERENCES AND ADDITIONAL RELATED READINGS REGARDING DIFFERENTIAL MONITORING, RISK ASSESSMENT, AND KEY INDICATOR METHODOLOGIES:**


- Barnard, Smith, Fiene, Swanson (2006). Evaluation of Pennsylvania's Keystone STARS Quality Rating and Improvement System, Pittsburgh: Pennsylvania, Office of Child Development.

- Fiene (2013a**).** A comparison of international child care and US child care using the Child Care Aware – NACCRRA (National Association of Child Care Resource and Referral Agencies) child care benchmarks, *International Journal of Child Care and Education Policy, 7(1),* 1-15.

- Fiene (2013b). *Differential monitoring logic model and algorithm.* Middletown: Pennsylvania, Research Institute for Key Indicators.

- Fiene (2013c). Head Start Key Indicators. Middletown: Pennsylvania, Research Institute for Key Indicators.

- Fiene (2013d). Kansas Child Care Key Indicators. Middletown: Pennsylvania, Research Institute for Key Indicators.

- Fiene (2013e). Validation of Georgia's core rule differential monitoring system. Middletown: Pennsylvania, Research Institute for Key Indicators.

- Fiene (2007). Child Development Program Evaluation & Caregiver Observation Scale, in T Halle (Ed.), *Early Care and Education Quality Measures Compendium*, Washington, D.C.: Child Trends.

- Fiene (2003). Licensing related indicators of quality child care, *Child Care Bulletin*, winter 2002-2003, pps 12-13.

- Fiene (2002a). *Thirteen indicators of quality child care: Research update*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services.

- Fiene (2002b). Improving child care quality through an infant caregiver mentoring project, *Child and Youth Care Forum, 31*(2), 75-83.

- Fiene, Iutcovich, Johnson, & Koppel (1998). Child day care quality linked to opportunities for professional development: An applied community psychology example. *Community Psychologist, 31*(1), 10-11.

- Fiene (1996). Using a statistical-indicator methodology for accreditation, in *NAEYC Accreditation: A Decade of Learning and the Years Ahead*, S. Bredekamp & B. Willer, editors, Washington, D.C.: National Association for the Education of Young Children.

- Fiene (1995). Utilizing a statewide training system to improve child day care quality: The other system in a program quality improvement model. *Child Welfare*, Volume LXXIV, #6, November-December, 1189-1201.

- Fiene (1985). Measuring the effectiveness of regulations, *New England Journal of Human Services, 5*(2), 38-39.
- Fiene (1981). A new tool for day care monitoring introduced by children's consortium, *Evaluation Practice, 1*(2), 10-11.
- Fiene, Greenberg, Bergsten, Carl, Fegley, & Gibbons (2002). *The Pennsylvania early childhood quality settings study*, Harrisburg, Pennsylvania: Governor's Task Force on Early Care and Education.
- Fiene & Kroh (2000). Licensing Measurement and Systems, *NARA Licensing Curriculum*. Washington, D.C.: National Association for Regulatory Administration.
- Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly, 14*(3), 198-214.
- Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators*. Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.
- Kontos & Fiene (1987). Child care quality, compliance with regulations, and children's development: The Pennsylvania Study, in *Quality in Child Care: What Does Research Tell Us?* Phillips, editor, Washington, D.C.: National Association for the Education of Young Children.
- Zellman, G. L. and Fiene, R. (2012). *Validation of Quality Rating and Improvement Systems for Early Care and Education and School-Age Care,* Research-to-Policy, Research-to-Practice Brief OPRE 2012. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services

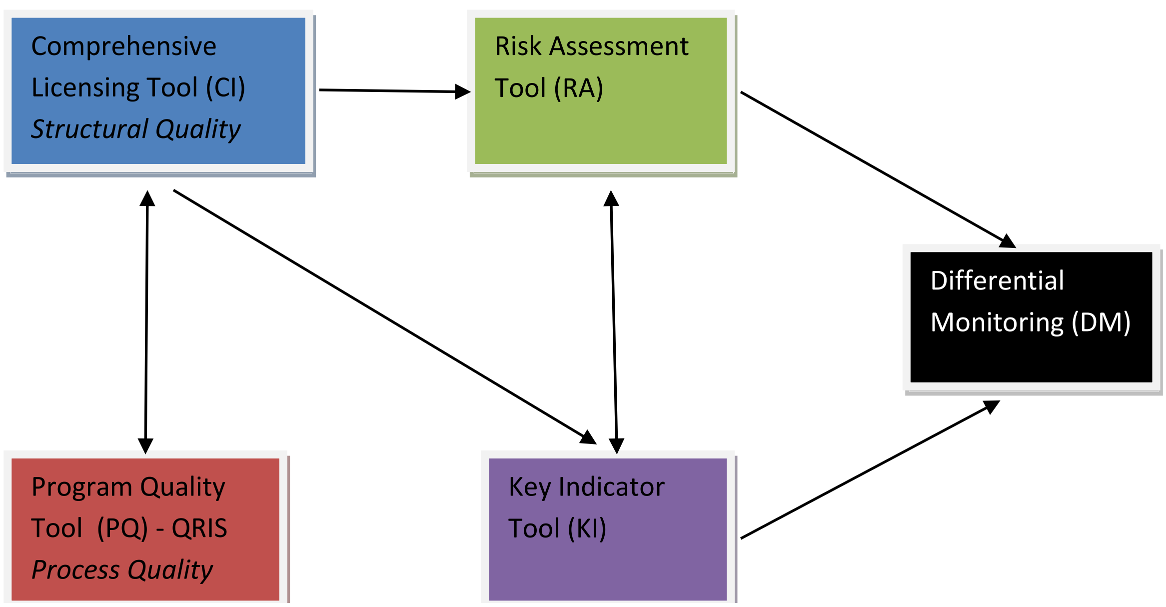
## Appendix – Graphic 1

**DIFFERENTIAL MONITORING LOGIC MODEL & ALGORITHM (DMLMA©) (Fiene, 2012): A 4th Generation ECPQIM – Early Childhood Program Quality Indicator Model**

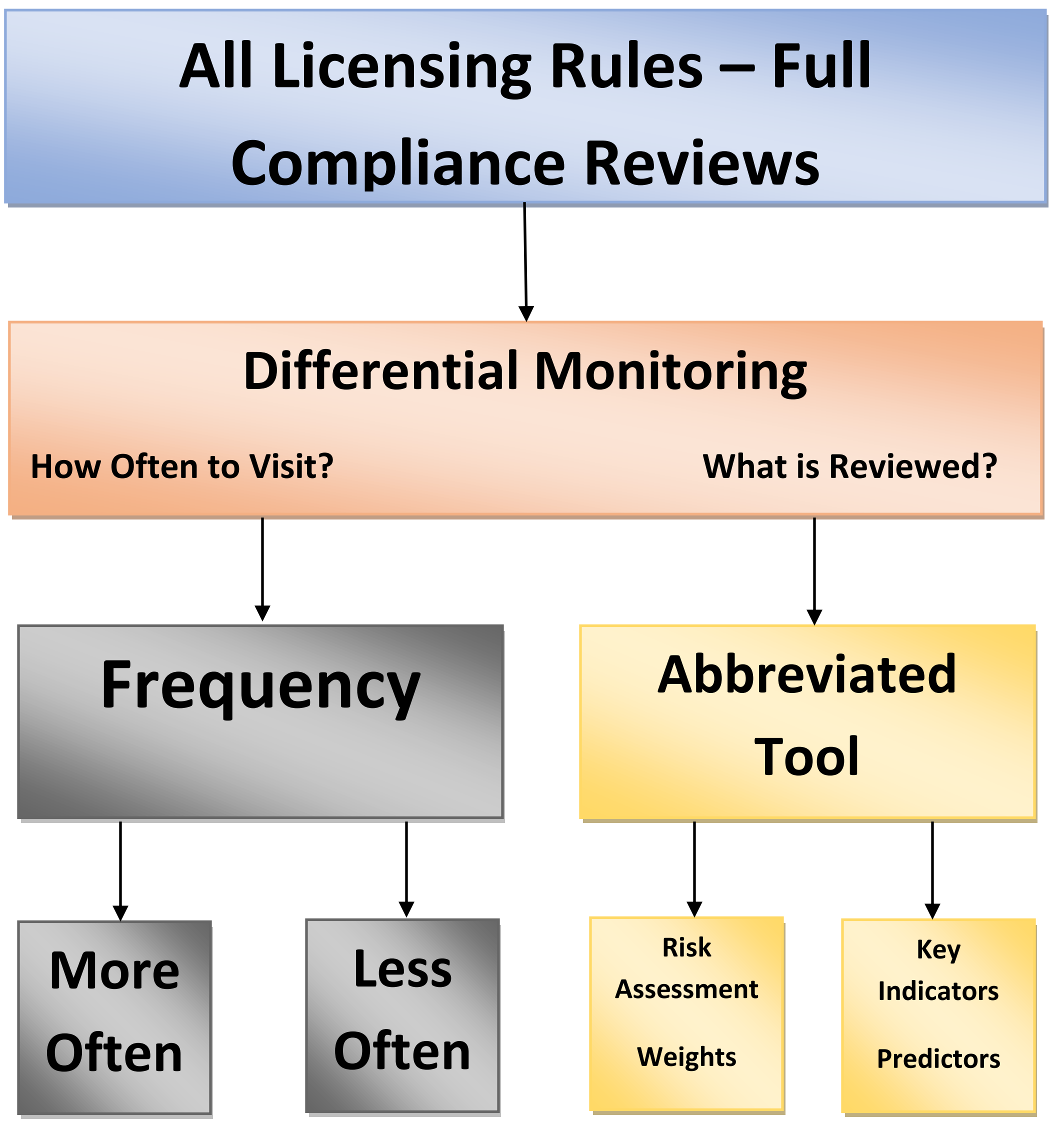
**CI x PQ => RA + KI => DM +** *PD => CO*

**<u>Definitions of Key Elements</u>:**

**PC** = Program Compliance/Licensing (Health and Safety, Protections for Children)
**PQ =** QRIS/Accreditation/Caregiver/Child Interactions
**RA** = Risk Assessment, (High Risk Rules)
**KI** = Key Indicators (Predictor Rules***)***
**DM** = Differential Monitoring (How often to visit and what to review)
*PD = Professional Development/Technical Assistance/Training (Not pictured but part of Model)*
*CO = Child Outcomes (Not pictured but part of Model)*



## Appendix – Graphic 2 - Licensing Rules, Compliance Reviews, Differential Monitoring, Abbreviated Tools, Risk Assessment, and Key Indicators



**New York Quality Indicators Project: Group Child Care Home Key Indicators (Renewal and Monitoring Inspections)**

**May 2015**

**Richard Fiene, Ph.D.**

These are the results from the key indicator analyses performed on the randomly selected 400 group child care home providers who comply with the 416 Rules for announced Renewal Inspections and 400 group child care home providers who had unannounced Monitoring inspections completed. Specific reference and documentation for the key indicator analyses and methodology can be found in Appendix 1.

As with all early care and education (ECE) licensing quality assurance data sets the data from the above two groups is highly skewed which means that the majority of programs are in full compliance (100%) with all the group child care home rules/regulations. In the sample drawn for the Renewal Inspections, 64% of the programs were in full compliance while for the Monitoring Inspections, 87% of the programs were in full compliance. See Appendix 2.

Table 1 contains the specific key indicators from the Renewal Inspections while Table 2 contains the specific key indicators from the Monitoring Inspections.

***Table 1 - Renewal Inspections***

| Rule Number | Content | Phi |
|---|---|---|
| 416.5.L.3 | Vaccine for pets | .29 |
| 416.5.A | Hazard free | .26 |
| 416.7.L | Sleeping and napping arrangements | .42 |
| 416.11.A.3 | Child Immunizations | .27 |
| 416.11.H.1.I | Parent consent for emergency medical treatment | .25 |
| 416.12.O | Infant formula | .27 |
| 416.12.Q | Bottles labeled | .25 |
| 416.15.C.3 | Emergency contact information | .35 |
| 416.15.C.4 | Adults who have permission to pick up child | .38 |
| 416.15.C.6 | Daily record of illnesses, injury, indicators of abuse | .33 |

These above 10 rules statistically predict overall compliance with all the rules. They represent about 4% of the total number of rules.

**Monitoring Inspections**

These are the results from the key indicator analyses performed on the randomly selected 400 group child care home providers who comply with the 416 Rules for unannounced Monitoring Inspections.

***Table 2 - Monitoring Inspections***

| Rule Number | Content | Phi |
|---|---|---|
| 416.4.H.4 | Paths of egress free of obstacles | .28 |
| 416.5.J | Toxic items are inaccessible | .31 |
| 416.8.A | Supervision at all times | .44 |
| 416.8.E | Approved primary caregiver present | .35 |
| 416.8.J.1 | Adult child ratio for preschoolers & school age | .28 |
| 416.8.J.2 | Two caregivers present when 6+children | .34 |
| 416.8.J.3 | Adult child ratio for infant & toddlers | .33 |
| 416.14.M | First aid and CPR | .52 |
| 416.15.B.12 | Any changes to the home reported | .29 |
| 416.15.B.20 | Supervision by approved primary caregiver | .38 |

These above 10 rules statistically predict overall compliance with all the monitoring rules. These 10 rules represent 77% of the total monitoring rules reviewed on any inspection. These results support the use of unannounced monitoring inspections as a very effective and efficient means of assuring an overall quality assurance in the licensing system.

However, it is not recommended that only these monitoring predictive rules be used, the State of New York should consider using the Monitoring Inspection Protocol along with the newly generated key indicators from the Renewal Inspection analyses as delineated in Table 1. The data from Table 1 were generated from full licensing inspections where all the rules were reviewed. By using both sets of key indicators, the state will balance the predictive and risk assessment aspects in their quality assurance licensing system.

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**Appendix 1: TECHNICAL ASPECTS OF THE KEY INDICATOR METHODOLOGY**

This section provides the technical and statistical aspects of the key indicator methodology. One of the first steps is to sort the data into high and low groups, generally the highest and lowest ratings can be used for this sorting. Frequency data will be obtained on those programs in the top level (usually top 20-25%) and the bottom level (usually the bottom 20-25%). The middle levels are not used for the purposes of these analyses. These two groups (top level & the bottom level) are then compared to how each program scored on each child care rule (see Figure 1).

| **Figure 1** | ***Providers In Compliance on Rule*** | ***Programs Out Of Compliance on Rule*** | ***Row Total*** |
|---|---|---|---|
| ***Highest level (top 20-25%)*** | ***A*** | ***B*** | ***Y*** |
| ***Lowest level (bottom 20-25%)*** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | ***Grand Total*** |

Once the data are sorted in the above matrix, the following formula (Figure 2) is used to determine if the rule is a key indicator or not by calculating its respective Phi coefficient. Please refer back to Figure 1 for the actual placement within the cells. The legend (Figure 3) below the formula shows how the cells are defined.

**Figure 2 – Formula for Phi Coefficient**

$$\phi = (A)(D) - (B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

**Figure 3 – Legend for the Cells within the Phi Coefficient**

***A = High Group + Programs in Compliance on Specific Rule.***
***B = High Group + Programs out of Compliance on Specific Rule.***
***C = Low Group + Programs in Compliance on Specific Rule.***
***D = Low Group + Programs out of Compliance on Specific Rule.***

***W = Total Number of Programs in Compliance on Specific Rule.***
***X = Total Number of Programs out of Compliance on Specific Rule.***
***Y = Total Number of Programs in High Group.***
***Z = Total Number of Programs in Low Group.***

Once the data are run through the formula in Figure 2, the following chart (Figure 4) can be used to make the final determination of including or not including the rule as a key indicator. Based upon the chart in Figure 4, it is best to have a Phi Coefficient approaching +1.00 however that is rarely attained with licensing data but has occurred in more normally distributed data.

Continuing with the chart in Figure 4, if the Phi Coefficient is between +.25 and -.25, this indicates that the indicator rule is unpredictable in being able to predict overall compliance with the full set of rules. Either a false positive in which the indicator appears too often in the low group as being in compliance, or a false negative in which the indicator appears too often in the high group as being out of compliance. This can occur with Phi Coefficients above +.25 but it becomes unlikely as we approach +1.00 although there is always the possibility that other rules could be found out of compliance. Another solution is to increase the number of key indicator rules to be reviewed but this will cut down on the efficiency which is desirable and the purpose of the key indicators.

The last possible outcome with the Phi Coefficient is if it is between -.26 and -1.00, this indicates that the indicator is a terrible predictor because it is doing just the opposite of the decision we want to make. The indicator rule would predominantly be in compliance with the low group rather than the high group so it would be statistically predicting overall non-compliance. This is obviously something we do not want to occur.

**Figure 4 – Thresholds for the Phi Coefficient**

| Phi Coefficient Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.26) | Good Predictor | Include |
| (+.25) – (-.25) | Unpredictable | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

**APPENDIX 2**

**Figure 5 – Bar Chart of Renewal Inspections Compliance Levels (Number of Violations)**

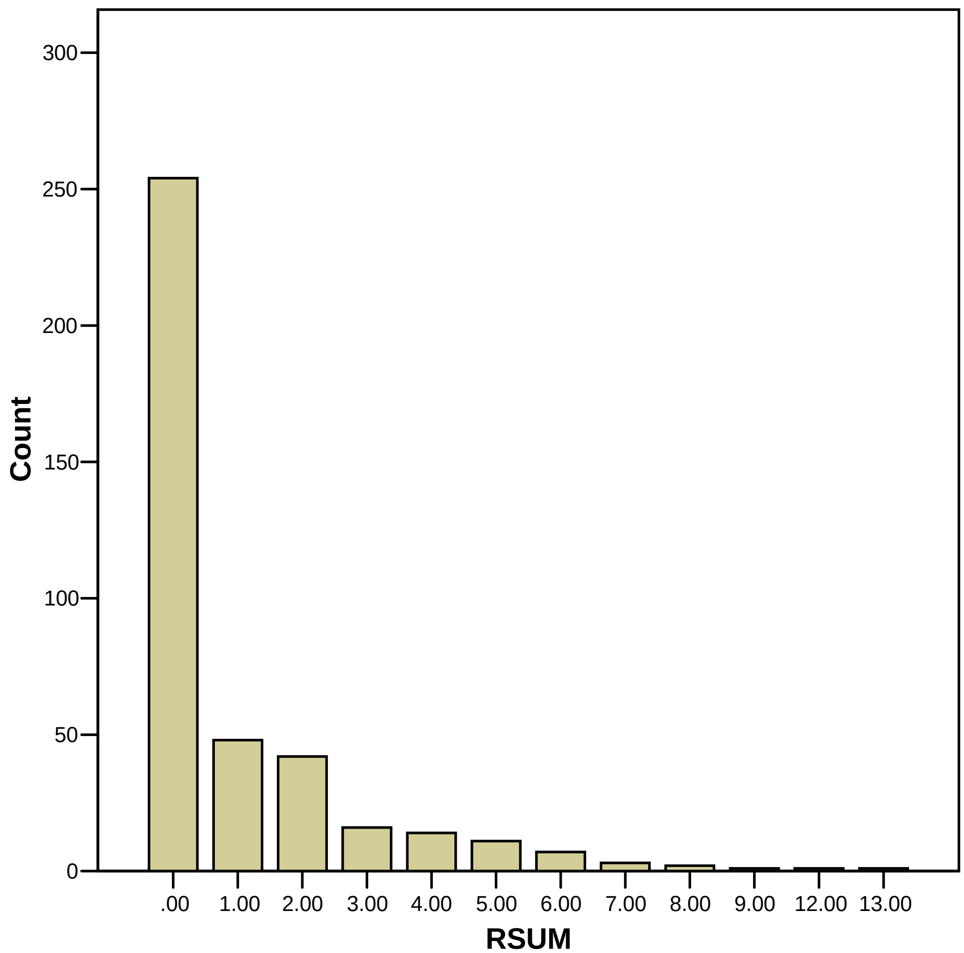


**Figure 6 – Bar Chart of Monitoring Inspections Compliance Levels (Number of Violations)**

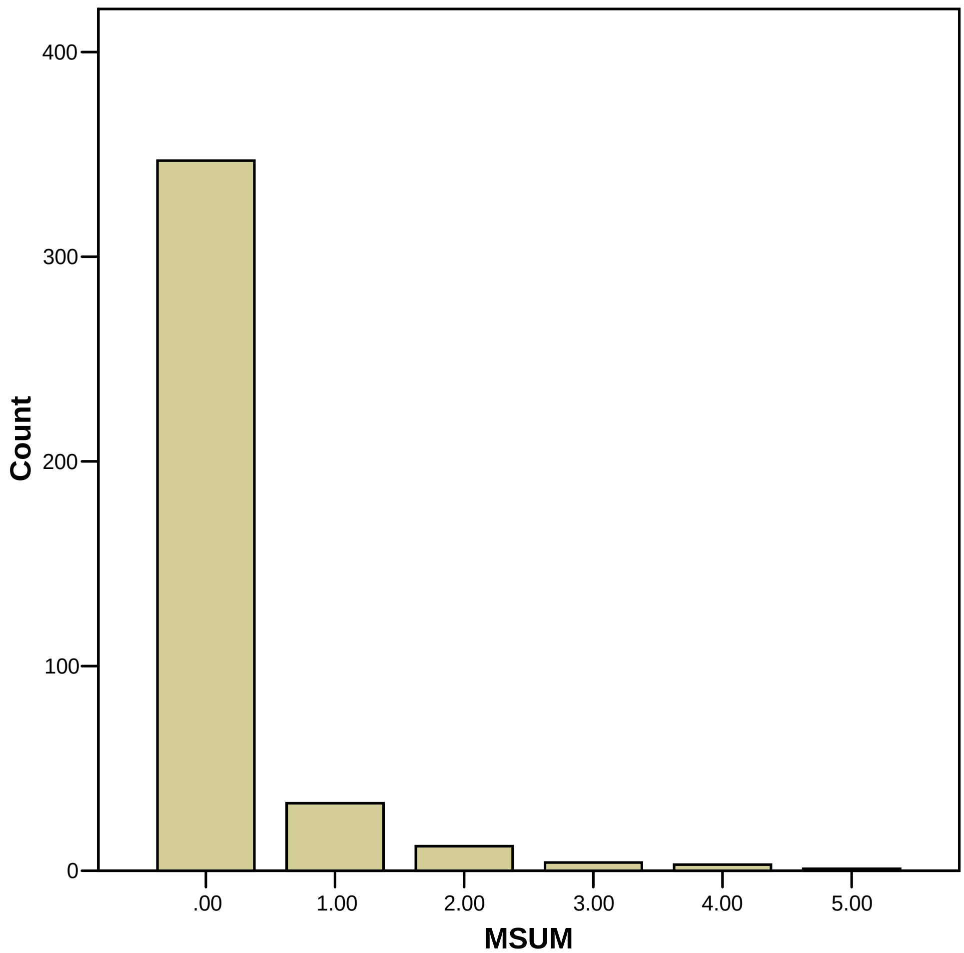


**Figure 7 – Line Chart of Renewal Inspections Compliance Levels (Number of Violations)**

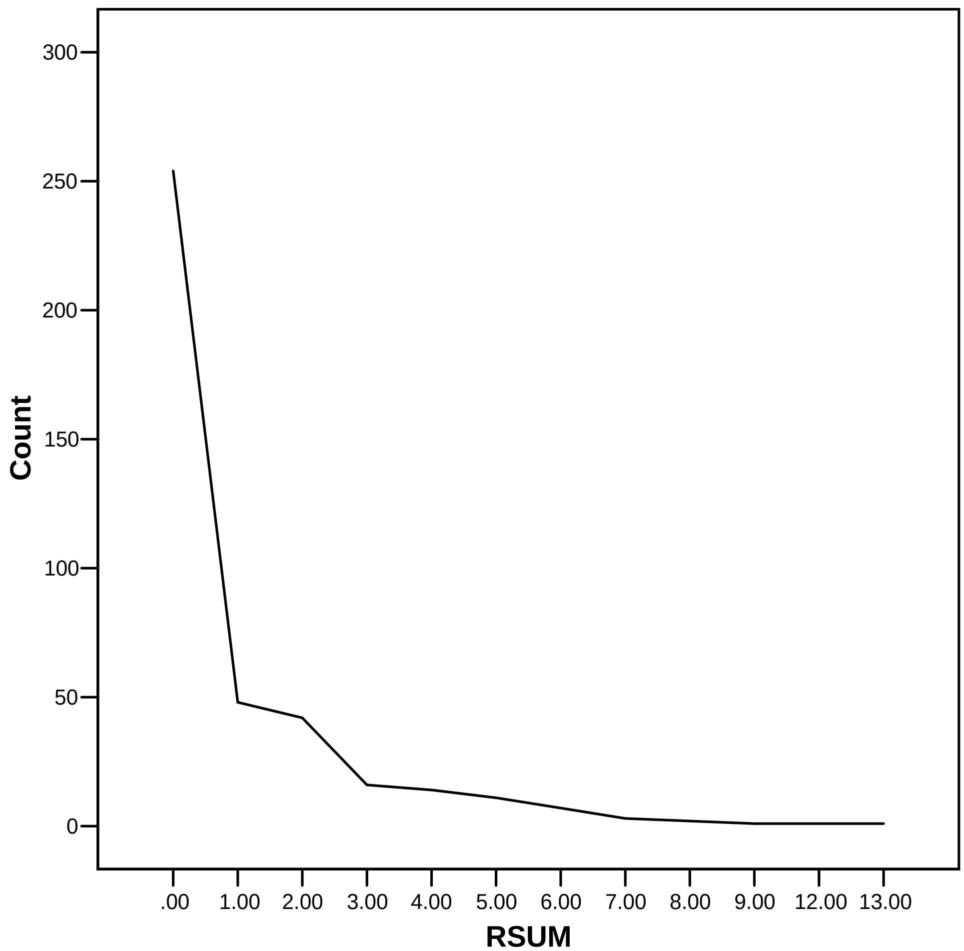
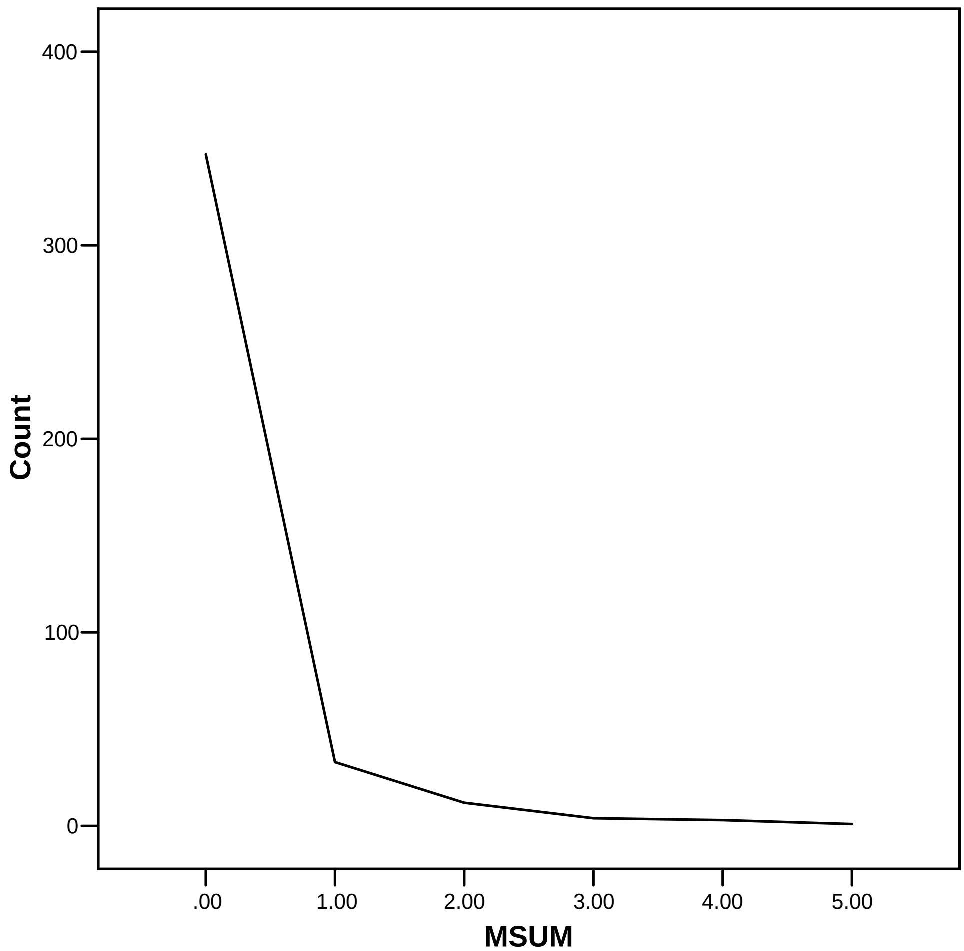


**Figure 8 – Line Chart of Monitoring Inspections Compliance Levels (Number of Violations)**



**New York Quality Indicators Project: Group Child Care Home Key Indicators (Renewal Inspections)**

**June 2015**

**Richard Fiene, Ph.D.**

These are the results from the key indicator analyses performed on the full data base of group child care homes (N = 1399) with the 416 Rules for announced Renewal Inspections. Usually these types of analyses are performed using a sample of data, such as 200 – 400 programs. The specific statistics used are most sensitive with a sample size within this range. Therefore, utilizing the full data set with well over 1000 programs is a new use of the Key Indicator methodology. The methodology and the results are still a very efficient way to reduce the full set of rules to a statistically predictive set of rules but there are some cautions which are pointed out throughout this brief report.

Some cautions noted are the following: 1) With the increased number of programs, the number of rules attaining the phi coefficient increases because the p-values decreased very significantly making many more rules statistically significant well below the .25 threshold. This is an expected result; however, the original decision table of maintaining the .25 threshold was used. 2) Whenever substantial compliance is introduced into the high group which was the case in two of the four analytical frameworks, it potentially increases the possibility that a specific key indicator rule could be out of compliance when the key indicators are used.

These analyses were unique in that the full data set was used which provided enhancements to the Key Indicator Methodology. In Table 1 below, the various results are provided demonstrating the differences amongst the various analytical frameworks. Four frameworks were used in constructing the analytical matrix for generating the Key Indicators: 1) (100/99) The high compliance group was defined as 100% in compliance (no violations) while the low compliance group was defined as 1 or more violations, 2) (99/95) The high compliance group was defined as 1 violation while the low compliance group was defined as 5 or more violations, 3) (100/95) The high compliance group was defined as 100% in compliance (no violations) while the low compliance group was defined as 5 or more violations, and 4) (100-99/95) The high compliance group was defined as 0-1 violations while the low compliance group was defined as 5 or more violations.

***Table 1 – Four Frameworks for Generating Key Indicators for Group Child Care Homes (416 Rules)***

| Rule | 100/99 | 99/95 | 100/95 | 100-99/95 | TOTAL | Content |
|---|---|---|---|---|---|---|
| 3H | --------- | -------- | .33 | .27 | 2 | no peeling paint |
| 4B1 | --------- | -------- | .31 | .25 | 2 | evacuation drills |
| 5A | --------- | -------- | .42 | .33 | 2 | hazard free |
| 5J | --------- | -------- | .27 | ----------- | 1 | danger items inaccess |
| 5L2 | --------- | -------- | .30 | .26 | 2 | pets licensed |
| L3 | --------- | .27 | .32 | .32 | 3 | pet vaccines |
| 5N5 | --------- | -------- | .25 | ----------- | 1 | outdoor surface |
| 5R | --------- | -------- | .25 | .25 | 2 | flashlight |
| 5V | --------- | -------- | .30 | .29 | 2 | carbon monoxide alarm |
| 6L | --------- | -------- | .26 | ----------- | 1 | transportation schedule |
| 7L | .31 | .50 | .61 | .57 | 4 | sleeping arrangements |
| 8A | --------- | .32 | .38 | .37 | 3 | supervision |
| 8E | --------- | -------- | .27 | .25 | 2 | primary caregiver |
| 8F | --------- | .26 | .30 | .30 | 3 | assistant present |
| 8J2 | --------- | -------- | .26 | ---------- | 1 | 2 caregivers present |
| 8J3 | --------- | .31 | .35 | .36 | 3 | one caregiver |
| 11B1ii | --------- | -------- | .27 | ---------- | 1 | med statement |
| 11c1 | --------- | -------- | .26 | ---------- | 1 | health care plan |
| 11c2i | --------- | -------- | .31 | .28 | 2 | health checks |
| 11H1i | --------- | .30 | .43 | .38 | 3 | emergency medical |
| 12N | --------- | .30 | .42 | .37 | 3 | parent agree feeding |
| 12O | --------- | -------- | .28 | .28 | 2 | parent agree formula |
| 13C | --------- | -------- | .34 | .26 | 2 | caregivers & SEL |
| 14F | --------- | -------- | .33 | --------- | 1 | 30 hrs training |
| 14M | .32 | -------- | .49 | .32 | 3 | cert in FA/CPR |
| 15A9 | --------- | -------- | .25 | --------- | 1 | licensed capacity |
| 15B12 | --------- | -------- | .26 | --------- | 1 | notified of any change |
| 15B22 | --------- | -------- | .28 | .26 | 2 | written policies |
| 15C3 | --------- | .44 | .54 | .51 | 3 | emergency contact |
| 15C4 | .27 | .47 | .59 | .55 | 4 | pickup child |
| 15C5 | --------- | .34 | .43 | .40 | 3 | daily attendance |
| 15C6 | .41 | .38 | .67 | .52 | 4 | health record |
| 15C13 | .25 | .29 | .49 | .40 | 4 | arrival departure |
| **TOTAL** | **5** | **12** | **33** | **24** | | |

These four frameworks provide guidance in determining the best combination of Key Indicators given the various compliance determinations, such as 100% compliance versus substantial but not full compliance with all the group child care home rules. In reviewing the frameworks, clearly the 100/99 option #1 where the high group is 100% in compliance with no violations is too stringent a criteria since so few rules make the cut for the Key Indicator threshold. The second option (99/95) where the high group has only 1 violation is a better option because it introduces additional Key Indicators. This option was completed by both the author and staff at NY/OCFS. The third option (100/95) where the high group is 100% in compliance with no violations but where the low group has 5 or more violations provides a much larger number of Key Indicators. This option really is less efficient (usually key indicator tools represent 10% or less of the full set of rules) by providing over 30 Key Indicators but it could be a good resource to add other Key Indicators randomly. The last option (100-99/95) where the high group has either no violations or 1 violation provides a nice balance with the number of Key Indicators generated. This option gets closer to the 10% ratio of Key Indicators to the full set of rules.

Based upon the results from Table 1, a recommendation could be made to use those Key Indicators that appear the most often in the four options. That would appear to be the best balanced approach. However, one must look at the licensing law to make certain that even this approach is a valid policy to pursue. For example, if the licensing law requires 100% full compliance with all rules, then this approach may not be the best policy decision. Selecting one of the 100% full compliance frameworks may be the better choice. However, if the state has discretion in issuing licenses on the basis of substantial but not full compliance than any of the frameworks will be ok or a combination of any of the four would also be a good policy decision.

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# Qualistar Rating Key Indicator Study

**Richard Fiene, Ph.D.**

**June 17, 2014**

**ABSTRACT**

This report provides an analysis of Colorado's quality rating system, the Qualistar Rating, for generating key indicators. Key indicators have been used a great deal in the licensing literature but this is a first time analysis in utilizing this methodology in a QRS (Quality Rating System) or a QRIS (Quality Rating and Improvement System). The key indicator methodology is described in detail applying it to QRS/QRIS. The results clearly indicate that the strongest key indicators are within the Family Partnerships component of the Qualistar Rating; however there are some major limitations to utilizing this methodology with QRS/QRIS.

## INTRODUCTION

The Qualistar Rating, administered by Qualistar Colorado, is one of the longest continuously running QRS in the United States. Presently over 50% of states have QRS/QRIS and the research on these program quality rating & improvement systems has increased over the years. One area of research that has been gaining momentum most recently is ascertaining the most effective and efficient delivery system for a QRS/QRIS as the number of early care and education programs participating in QRS/QRIS continues to increase. This report provides an overview to the topic and introduces an option that has been used in the human services/child care licensing field in identifying key indicators of overall compliance with standards. The purpose of the key indicator methodology is to focus monitoring visits on those standards that have the ability to predict overall compliance with the full set of QRS/QRIS standards. The key indicator methodology is part of a program monitoring approach called Differential Program Monitoring which was developed to help streamline the program monitoring of early care and education programs (please see the Appendix for two graphics which help to depict this relationship (Figures 8/9). It was first applied in child care licensing (Fiene & Nixon, 1985) but has been used in many other service types, such as: Head Start Performance Standards (Fiene, 2013a), National Accreditation (Fiene, 1996), and child and adult residential programs (Kroh & Melusky, 2010). The methodologies are based upon statistical protocols that have been developed in the tests and measurements literature in which an abbreviated set of items is used to statistically predict as if the full test was applied. This methodology has been used in regulatory analysis and is now being proposed for use in Quality Rating and Improvement Systems (Fiene, 2013b). This study and report is the first demonstration of its use with QRS.

## TECHNICAL ASPECTS OF THE KEY INDICATOR METHODOLOGY

This section provides the technical and statistical aspects of the key indicator methodology. It will provide the specific methodology for generating the key indicators for the Qualistar Rating.

One of the first steps is to sort the data into high and low groups, generally the highest and lowest ratings can be used for this sorting. In very large states such as Colorado this is done on a sampling basis. Frequency data will be obtained on those programs in the top level (usually top 20-25%) and the bottom level (usually the bottom 20-25%). The middle levels are not used for the purposes of these analyses. These two groups (top level & the bottom level) are then compared to how each program scored on each item within the specific assessment tool (see Figure 1). An example from the Qualistar Rating database is provided in Figure 2 (see Figure 2).

| **Figure 1** | ***Providers In Compliance or Top 25%*** | ***Programs Out Of Compliance or Bottom 25%*** | ***Row Total*** |
|---|---|---|---|
| ***Highest level (top 20-25%)*** | ***A*** | ***B*** | ***Y*** |
| ***Lowest level (bottom 20-25%)*** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | ***Grand Total*** |

Because of the differences in the data distribution for the Qualistar Rating, the above cutoff points had to be more stringent with the respective cutoff points for the high and low groups because the majority of the programs were at the Star 2 and 3 levels. In comparing these data to past licensing distributions (see Fiene, 2013d), it would be expected that the majority of programs would be at a Star 1 level, but that was not the case with this sample. Rather than using a 20-25% cut off point, it was changed to 10% to accommodate this difference. Figure 2 depicts that all programs that were in the top 10% were in the highest rating while the bottom 10% were in the lowest rating. The data depicted in Figure 2 are taken from the *Family*

*Engagement Standard 5 – The program provides opportunities for staff and families to get to know one another*. The reason for selecting this particular standard is that it demonstrates a perfect Phi Coefficient in discriminating between the highest level and the lowest level[1].

| ***Figure 2:*** ***Criterion 5 Family Partnerships*** | ***Providers In Compliance or Top 10%***[1] | ***Programs Out Of Compliance or Bottom 10%*** | ***Row Total*** |
|---|---|---|---|
| ***Highest Star level*** | ***11*** | ***0*** | ***11*** |
| ***Lowest Star level*** | **0** | ***10*** | ***10*** |
| ***Column Total*** | ***11*** | ***10*** | **21** |

Once the data are sorted in the above matrix, the following formula (Figure 3) is used to determine if the standard is a key indicator or not by calculating its respective Phi Coefficient. Please refer back to Figure 1 for the actual placement within the cells and Figure 2 for the data within the cells. The legend (Figure 4) below the formula shows how the cells are defined.

**Figure 3 – Formula for Phi Coefficient**

$$\phi = (A)(D)-(B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

**Figure 4 – Legend for the Cells within the Phi Coefficient**

*A = High Group + Programs in Compliance on Specific Compliance Measure.*
*B = High Group + Programs out of Compliance on Specific Compliance Measure.*
*C = Low Group + Programs in Compliance on Specific Compliance Measure.*
*D = Low Group + Programs out of Compliance on Specific Compliance Measure.*

*W = Total Number of Programs in Compliance on Specific Compliance Measure.*
*X = Total Number of Programs out of Compliance on Specific Compliance Measure.*
*Y = Total Number of Programs in High Group.*
*Z = Total Number of Programs in Low Group.*

Once the data are run through the formula in Figure 3, the following chart (Figure 5) can be used to make the final determination of including or not including the item as a key indicator. Based upon the chart in Figure 5, it is best to have a Phi Coefficient approaching +1.00 since the data are more normally distributed[2] than is the case with licensing data.

Continuing with the chart in Figure 5, a Phi Coefficient between +.75 and -.25 indicates that the indicator is unpredictable in being able to predict overall compliance with the quality rating assessment tool. Either a false positive in which the indicator appears too often in the low group as being in compliance, or a false negative in which the indicator appears too often in the high group as being out of compliance[3]. This can occur with Phi Coefficients above +.75 but it becomes unlikely as they approach +1.00, although there is always the possibility that other standards/rules/regulations could be found to be out of compliance (this was demonstrated in a study conducted by the author (Fiene, 2013c). Another solution is to increase the number of key indicators to be reviewed but this will cut down on the efficiency which is desirable and the purpose of the key indicators.

The last possible outcome with the Phi Coefficient is if it is between -.26 and -1.00, this indicates that the indicator is a terrible predictor because it is doing just the opposite of the desired. The indicator would predominantly be in compliance with the low group rather than the high group so it would be statistically predicting overall non-compliance. This is obviously undesirable.

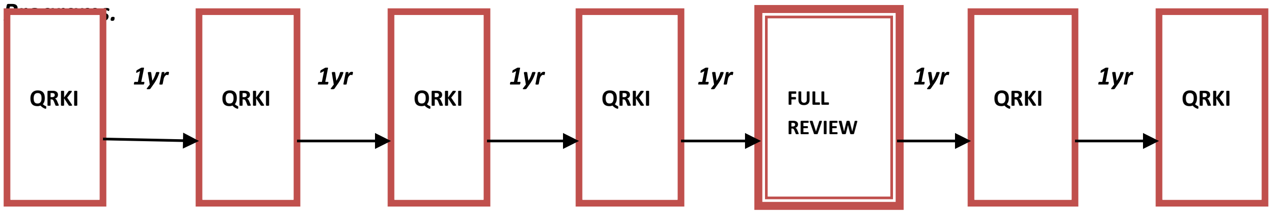
**Figure 5 – Thresholds for the Phi Coefficient (Fiene & Nixon, 1983, 1985)(Fiene, 2014)**

| Phi Coefficient Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.76) | Good Predictor | Include |
| (+.75) – (-.25) | Unpredictable | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

The key indicators should then only be used with those programs that have attained the highest rating. It is not intended for those programs that have attained lower ratings. However, even with those programs that have attained the highest rating, periodically a full, comprehensive review using the full set of standards for Qualistar Colorado should occur (see Figure 6 for a graphical depiction). It is intended that a re-validation of the key indicators occur on a periodic basis to make certain that the key indicators have not changed because of differences in compliance with standards history. This is an important and necessary step for the program to engage in to ascertain the overall validity and reliability of the assessment system. Also there should not have been any major changes in the program while the key indicators are being administered, such as the director leaving or a large percentage of teachers leaving or enrollment increasing significantly, or a change in the licensing or accreditation status of the program.

**Figure 6 - Proposed DMLMA System with Key Indicators (KI)**

***Use of Qualistar Rating Key Indicators (QRKI) for Monitoring with a Full Review every 4th Year for Star 4 Programs.***




**This model is taken from the licensing literature and as will be pointed out in the Limitations and Conclusion Sections may not necessarily be appropriate for QRS/QRIS systems depending on a state's QRS/QRIS data distribution. It is provided for illustrative purposes.**

## RESULTS

The results reported in this section are based upon a sample selected from the overall Qualistar Rating database from its most recent monitoring reviews (N = 117). This was a representative sample of the program's QRS.

There are five components of the Qualistar Rating: Learning Environment, Family Partnerships, Training and Education, Adult to Child Ratios and Group Size, and Accreditation. See Figures 10-14 in the Appendix for the graphical depictions of the data distributions for the five major criteria. The data distributions are provided because a pre-requisite for calculating the key indicator Phi Coefficients is the dichotomization of data with a skewed data distribution. Figures 10-14 display how much the data are skewed.

The Qualistar Rating is a zero-to-4 star system, with 4 stars indicating the highest level of quality[4]. Eleven programs were rated at the Star 1 level, 19 programs were rated at the Star 2 level, 77 programs were rated at the Star 3 level, and 10 programs were rated at the Star 4 level for a total of 117 programs included in these analyses. There were no programs in the sample that earned less than one star.

Based upon the key indicator methodology described in the previous section, the only Qualistar Rating standards that reached key indicator designation[5] were the following: *Family Partnership Standard/Criterion 5 = The program provides opportunities for staff and families to get to know one another; Family Partnership Standard/Criterion 7 = Families receive information on their child's progress on a regular basis, using a formal mechanism such as a report or parent conference and Family Partnership Standard/Criterion 8 = Families are included in planning and decision making for the program.*

**Figure 7 – Key Indicators with Phi Coefficients**

| | Phi | Significance |
|---|---|---|
| **Family Partnership Standard/Criterion 5** | **1.00** | **.001** |
| **Family Partnership Standard/Criterion 7** | **0.86** | **.001** |
| **Family Partnership Standard/Criterion 8** | **0.83** | **.001** |

There were many other significant correlations (Family Partnerships and Adult-to-Child Ratios and Group Sizes) obtained but none reached the cutoff threshold of .76+ for the Phi calculations. These other correlations are reported in the Appendix after the descriptive graphical displays in Figures 15, 15a, 15b. The Phi Coefficients for the other Criteria (Learning Environment, Training and Education, and Program Accreditation) were not calculated because the data distributions were not skewed as was the case with Family Partnerships and Adult-to-Child Ratios and Group Sizes (see Figures 10-14).

## LIMITATIONS

There are two major limitations to this study, 1) the first deals with the statistics being used to generate the key indicators; 2) the second deals with the key indicator methodology.

The first limitation has to do with dichotomization of data which should only be used with very skewed data. Data skewness always occurs with licensing data because of the nature of the data, health and safety protections (the majority of programs are always in compliance with the respective rules). However, this appears to not always be the case with QRS/QRIS data which deals with more program quality aspects of facilities and shows greater variation in the data. If this is the case then dichotomization of data is not appropriate and should not be utilized in order to generate key indicators.

The second limitation of this study is if the key indicator methodology and differential monitoring approaches are appropriate for QRS/QRIS. In Figure 6 above and in the conclusion to this report below, there is a scenario where it can be used but Qualistar Colorado and each state must determine if this is an appropriate approach for their respective program. For example, key indicators will not work in a block model and with a point-system model may generate very limited time savings if the data distribution is normally distributed and there are very few programs at the highest star level. In licensing data base distributions there is always a large number of programs to select from in the highest compliance levels (usually a minimum of 25%).

**CONCLUSION/FUTURE RESEARCH/DISCUSSION/RECOMMENDATIONS**

This study is the first of its kind in generating key indicators for a QRS based upon the analyses performed with the Qualistar Rating data base. It potentially demonstrates that the use of the key indicator methodology with QRS/QRIS could be feasible and warranted in order to focus limited program monitoring resources in a most efficient and effective manner keeping the above stated limitations in mind as stated in the previous Limitations Section. In the future, Qualistar Colorado may want to pilot an approach utilizing a small group of programs and could focus resources on the Family Partnership/Engagement standards on an ongoing basis between comprehensive reviews as depicted in Figure 6 above for Star 4 programs. The time saved here could then be redistributed to spending more time with the Star 1 programs.

It will be timely to see other states and programs who are interested in generating key indicators if they have Family Partnership/Engagement standards as part of their respective QRS/QRIS to determine if these standards reach the same threshold for key indicator designation as has occurred in this study. It will also be interesting to see if any other state's criteria/standards data distributions are similar to what has been found in the Qualistar Rating or not.

However, as highlighted in the Limitations Section, states and programs need to consider if the key indicator methodology and the resultant differential monitoring model is really warranted and appropriate for their respective QRS/QRIS's. As has been the case with Colorado's Qualistar Rating, only two of the five major criteria: Family Partnerships and Adult-Child Ratio/Group Size were determined to be good candidates for the key indicator Methodology in which the data were skewed[6] enough to warrant dichotomization. The other three major criteria: Learning Environment, Training and Education, and Program Accreditation were determined not to be sufficiently skewed to warrant dichotomization. This sets up a decision making system in which only 40% of the criteria are being used and severely limits the overall predictability of the key indicators selected. Could the other criteria be used to generate key indicators? Of course, but dichotomization of data should not be done when data are not highly skewed (MacCallun, etal, 2002). *Yes, we were successful in generating Key Indicators for the Qualistar Rating but within a limited scenario in how they should be used*. The results are not equivalent to what has been found and utilized in the licensing literature where the licensing data are always highly skewed. If a state or program find that all their standards are skewed in a similar way to licensing data then dichotomization of data and the generation of key indicators is warranted.

A recommendation to Colorado's Qualistar and other programs and states where they find the data from their standards more normally distributed that they not use a key indicator approach. The key indicator approach remains a reliable and valid methodology for licensing but only in very special and limited cases will it be an appropriate monitoring approach for more program quality focused systems, such as QRS/QRIS and accreditation. *For those QRS/QRIS systems where the standards are more normally distributed, the recommendation would be to continue to use the full set of QRS/QRIS standards and not use an abbreviated set of standards.*

**NOTES:**

1. For analytical purposes, the top 10% of programs received an average score of 8 points or higher on a 10 point scale and the bottom 10% of programs received an average score of 2 points or less on a 10 point scale.

2. The reason for pointing out the need to have a higher Phi Coefficient than what has been reported previously (Fiene & Nixon, 1983, 1985) is the fact that the dichotomization of data should only be used with skewed data and not normally distributed data because it will accentuate differences. However, since the purpose of the dichotomization of data is only for sorting into a high and low group, it would appear to be acceptable for this purpose (MacCallun, etal, 2002. On the practice of dichotomization of quantitative variables, *Psychological Methods, 7, 1,* 19-40.).

3. These results would show an increase in cells B and C in Figure 1 which is undesirable; it should always be the case where A + D > B + C for key indicators to maintain their predictive validity.

4. The following point values equate to the various Star levels in the Qualistar Rating System (for detailed information regarding the QRS system please see the following document: *Qualistar Colorado – Qualistar Rating Criteria Chart*, November 2012):

Provisional = 0 – 9 points or Learning Environment score of 0
Star 1 = 10 - 17 points
Star 2 = 18 - 25 points
Star 3 = 26 - 33 points
Star 4 = 34 - 42 points

Qualistar Rating Criteria Chart:
Learning Environment = points are awarded based on average classroom scores on the ERS Scales. (Score of component: 1 – 10)
Family Partnerships = points are awarded based on how well programs communicate with collaborate with, and involve families. Score of component: 1 – 10)
Training and Education = points are awarded to teachers & center administrators based on their professional development level and amount of experience, with criteria separated by position. Score of component: 1 – 10
Adult-to-Child Ratios & Group Size = points are awarded based on the average adult-to -child ratio and group size in each classroom. Score of component: 1 – 10
Program Accreditation = points are awarded for receiving and maintaining national program accreditation through an approved organization. Score of component: 0 or 2 points

*The reader needs to keep in mind that Qualistar Colorado is not a state agency but rather a private non-profit agency.*

5. The three Family Partnership Standards were met at the Star 4 level always or most of the time (see Figure 2).

6. The respective skewness figures are the following: Family Partnership = -1.425; Adult-Child Ratio/Group Size = -1.506; Learning Environment = -0.946; Training and Education = 0.028; Program Accreditation = 7.548. See Figure 16 for basic descriptive statistics for these Criteria.

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**REFERENCES AND ADDITIONAL RELATED READINGS REGARDING DIFFERENTIAL MONITORING, RISK ASSESSMENT, AND KEY INDICATOR METHODOLOGIES:**


- Barnard, Smith, Fiene, Swanson (2006). Evaluation of Pennsylvania's Keystone STARS Quality Rating and Improvement System, Pittsburgh: Pennsylvania, Office of Child Development.

- Fiene (2013a***).*** A comparison of international child care and US child care using the Child Care Aware – NACCRRA (National Association of Child Care Resource and Referral Agencies) child care benchmarks, *International Journal of Child Care and Education Policy, 7(1),* 1-15.

- Fiene (2013b)(2014). *Differential monitoring logic model and algorithm.* Middletown: Pennsylvania, Research Institute for Key Indicators.

- Fiene (2013c). Head Start Key Indicators. Middletown: Pennsylvania, Research Institute for Key Indicators.

- Fiene (2013d). Kansas Child Care Key Indicators. Middletown: Pennsylvania, Research Institute for Key Indicators.

- Fiene (2013e). Validation of Georgia's core rule differential monitoring system. Middletown: Pennsylvania, Research Institute for Key Indicators.

- Fiene (2007). Child Development Program Evaluation & Caregiver Observation Scale, in T Halle (Ed.), *Early Care and Education Quality Measures Compendium*, Washington, D.C.: Child Trends.

- Fiene (2003). Licensing related indicators of quality child care, *Child Care Bulletin*, winter 2002-2003, pps 12-13.

- Fiene (2002a). *Thirteen indicators of quality child care: Research update*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services.

- Fiene (2002b). Improving child care quality through an infant caregiver mentoring project, *Child and Youth Care Forum, 31*(2), 75-83.

- Fiene, Iutcovich, Johnson, & Koppel (1998). Child day care quality linked to opportunities for professional development: An applied community psychology example. *Community Psychologist, 31*(1), 10-11.

- Fiene (1996). Using a statistical-indicator methodology for accreditation, in *NAEYC Accreditation: A Decade of Learning and the Years Ahead*, S. Bredekamp & B. Willer, editors, Washington, D.C.: National Association for the Education of Young Children.

- Fiene (1995). Utilizing a statewide training system to improve child day care quality: The other system in a program quality improvement model. *Child Welfare*, Volume LXXIV, #6, November-December, 1189-1201.

- Fiene (1985). Measuring the effectiveness of regulations, *New England Journal of Human Services, 5*(2), 38-39.

- Fiene (1981). A new tool for day care monitoring introduced by children's consortium, *Evaluation Practice, 1*(2), 10-11.

- Fiene, Greenberg, Bergsten, Carl, Fegley, & Gibbons (2002). *The Pennsylvania early childhood quality settings study*, Harrisburg, Pennsylvania: Governor's Task Force on Early Care and Education.

- Fiene & Kroh (2000). Licensing Measurement and Systems, *NARA Licensing Curriculum*. Washington, D.C.: National Association for Regulatory Administration.

- Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly, 14*(3), 198-214.

- Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators*. Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.

- Kontos & Fiene (1987). Child care quality, compliance with regulations, and children's development: The Pennsylvania Study, in *Quality in Child Care: What Does Research Tell Us?* Phillips, editor, Washington, D.C.: National Association for the Education of Young Children.

- Zellman, G. L. and Fiene, R. (2012). *Validation of Quality Rating and Improvement Systems for Early Care and Education and School-Age Care,* Research-to-Policy, Research-to-Practice Brief OPRE 2012. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services

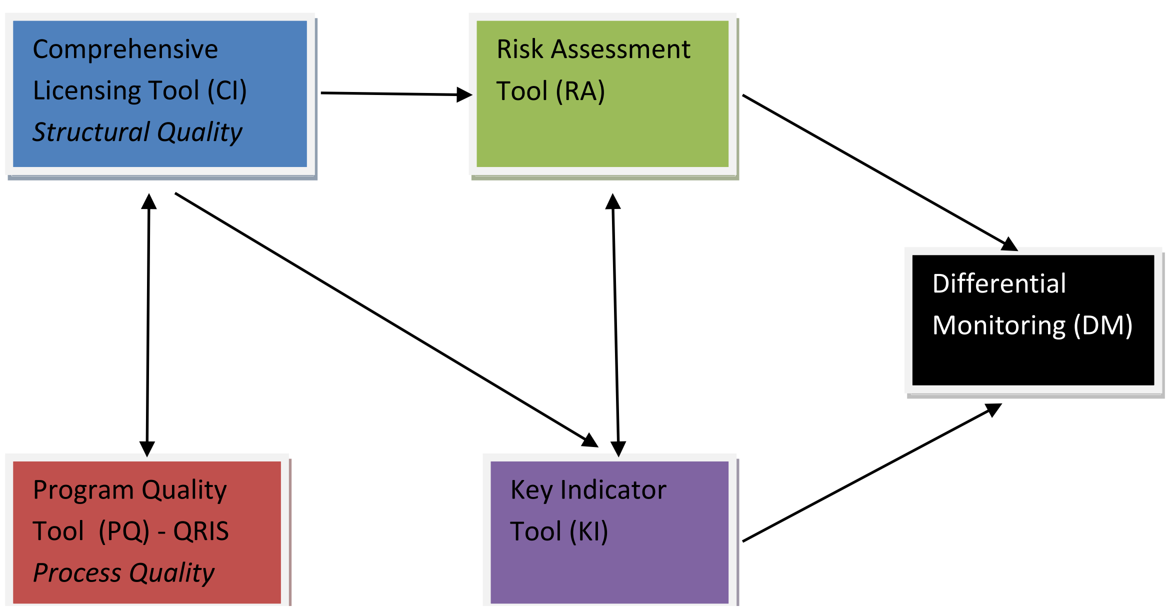
# Appendix – Figure 8

**DIFFERENTIAL MONITORING LOGIC MODEL & ALGORITHM (DMLMA©) (Fiene, 2012): A 4th Generation ECPQIM – Early Childhood Program Quality Indicator Model**

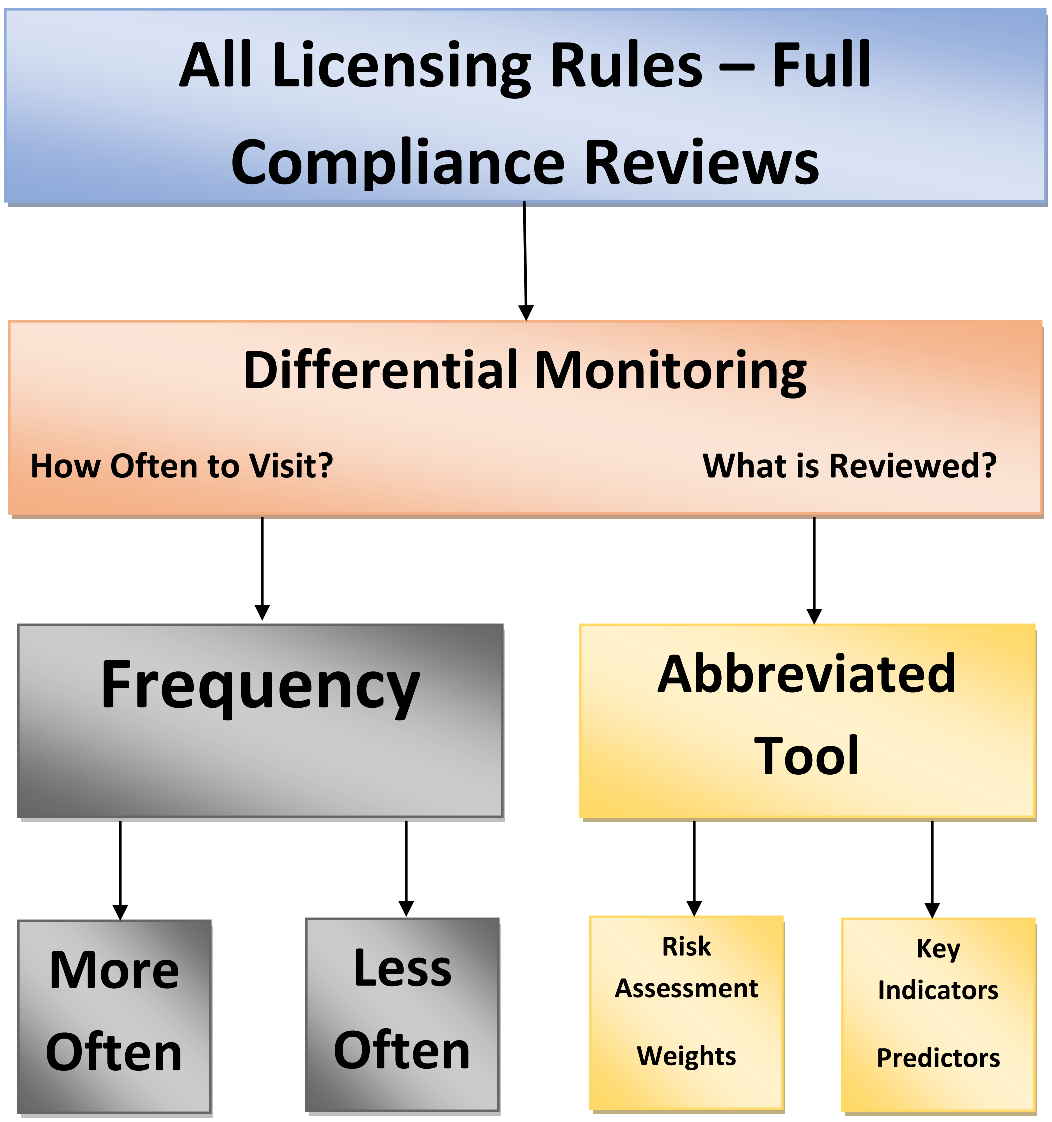
**CI x PQ => RA + KI => DM +** *PD => CO*

**Definitions of Key Elements:**

**PC** = Program Compliance/Licensing (Health and Safety) (***Caring for Our Children***)
**PQ =** QRIS/Accreditation/Caregiver/Child Interactions/Classroom Environment Quality (***ERS/CLASS/PAS/BAS***)
**RA** = Risk Assessment, (High Risk Rules) (***Stepping Stones***)
**KI** = Key Indicators (Predictor Rules***) (13 Key Indicators of Quality Child Care***)
**DM** = Differential Monitoring (How often to visit and what to review)
*PD = Professional Development/Technical Assistance/Training (Not pictured but part of Model)*
*CO = Child Outcomes (Not pictured but part of Model)*

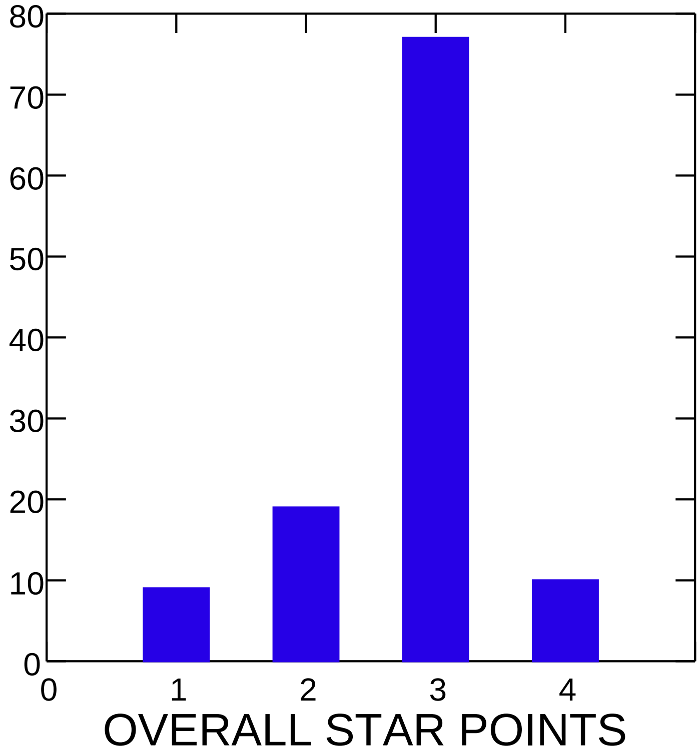


## Appendix – Figure 9 - Licensing Rules, Compliance Reviews, Differential Monitoring, Abbreviated Tools, Risk Assessment, and Key Indicators



# APPENDIX

**Figure 10**




Figures 10-14 depict the data distributions for overall Star points as well as for the major criteria/standards (Training & Education, Learning Environment, Adult-to-Child Ratios & Group Size, and Family Partnerships). Figures 13-14 clearly demonstrate how these respective criteria/standards are extremely skewed data distributions while Figures 10-12 show a more normally distributed data pattern. This is important for which standards can be dichotomized and phi coefficients generated. Dichotomization of data should only be used with skewed data which is the case in figures 13-14. It is not appropriate with the data distributions in figures 10-12. Also see Figure 16 for additional descriptive statistics for the specific criteria.

**Figure 11**

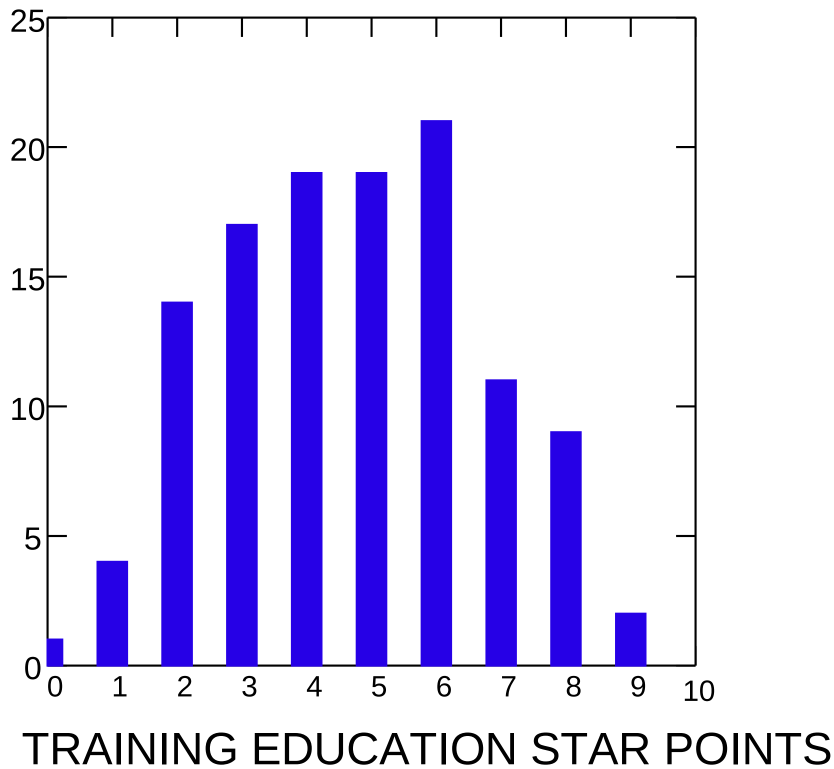


**Figure 12**

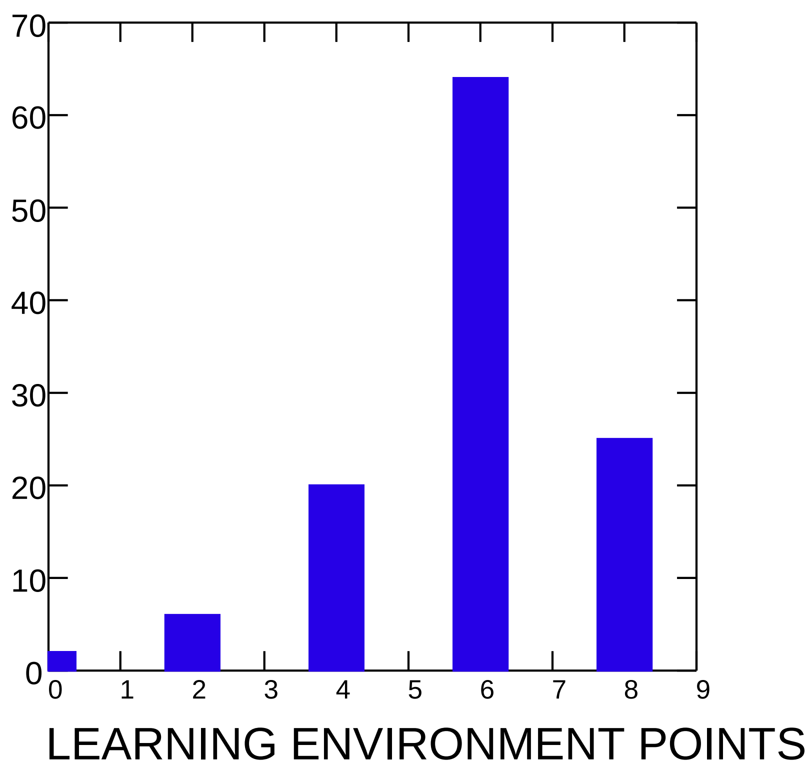

70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9
LEARNING ENVIRONMENT POINTS

**Figure 13**

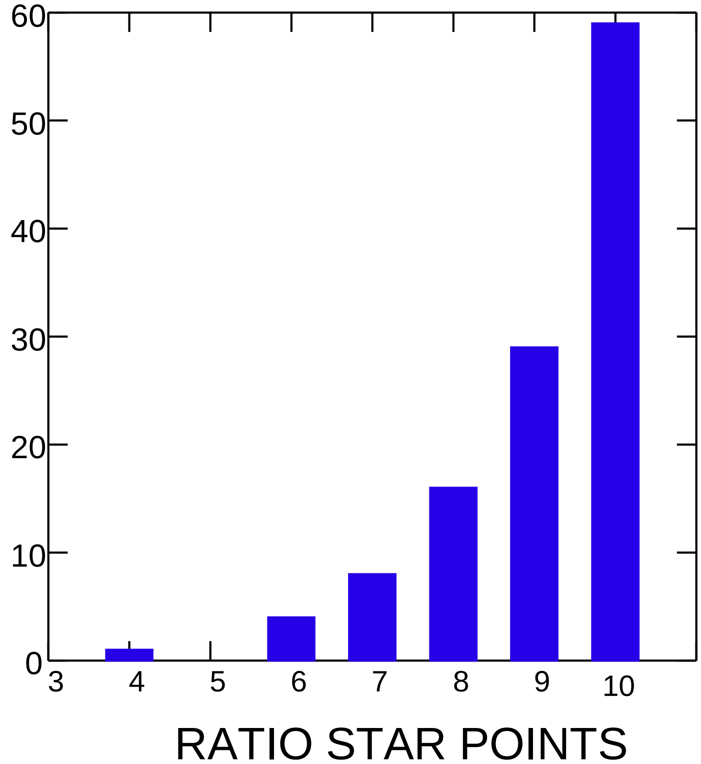


**Figure 14**

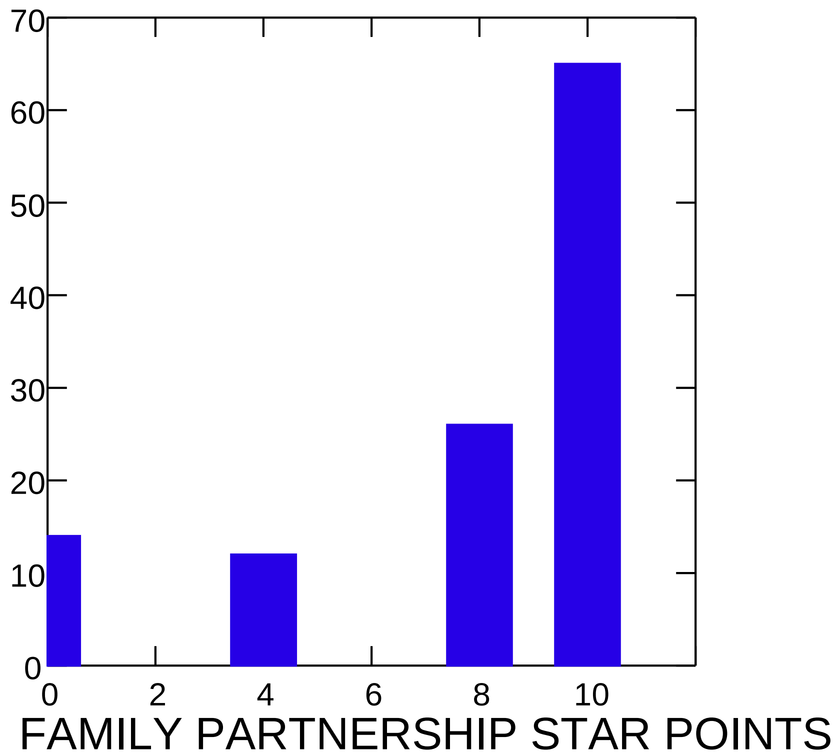


**Figure 15**

**Selected Relationships amongst the Standards/Criteria and Star Level**

| Standards/Criteria | Correlation (r) |
|---|---|
| Family Partnerships x Star Level | .80**** |
| Learning Environment x Star Level | .68*** |
| Training/Education x Star Level | .54** |
| Adult-Child Ratio/Group Size x Star Level | .46* |
| Program Accreditation x Star Level | .11 |

* p < .05
** p < .01
*** p<.001
**** p < .0001

**Figure 15a**

| Family Partnership Criteria | Phi | Significance |
|---|---|---|
| Criterion 1 | .23 | ns |
| Criterion 2 | .53 | .02 |
| Criterion 3 | .46 | .04 |
| Criterion 4 | .46 | .04 |
| Criterion 5 | 1.00 | .001 |
| Criterion 6 | .46 | .04 |
| Criterion 7 | .86 | .001 |
| Criterion 8 | .83 | .001 |
| Criterion 9 | .72 | .001 |
| Criterion 10 | .60 | .006 |
| Criterion 11 | .46 | .04 |
| Criterion 12 | .53 | .02 |
| Criterion 13 | .21 | ns |
| Criterion 14 | .46 | .04 |
| Criterion 15 | .39 | ns |
| Criterion 16 | .75 | .001 |
| Criterion 17 | .60 | .006 |

**Legend:**
Criteria 1 – 7 involve the program providing information to families.
Criteria 8 – 15 involve families in planning, communicating and decision making for the program.
Criteria 16 – 17 involve a written plan and evaluating the program’s family partnerships.

**Figure 15b**

| Adult-Child Ratio/Group Size | Phi | Significance |
|---|---|---|
| Adult-Child Ratios | .58 | .0001 |
| Group Size | .33 | .02 |

Family Partnerships and Adult-Child Ratio/Group Size standards/criteria phi coefficients were generated because of the skewed data distributions. Phi coefficients were not generated for Learning Environment, Training and Education or Program Accreditation because the data were not sufficiently skewed or showed no variability at all in their respective distributions.

**Figure 16**

**Basic Descriptive Statistics for Criteria**

| Criteria | Mean | Median | Skewness |
|---|---|---|---|
| Family Partnerships | 7.7 | 10 | -1.425 |
| Adult-to-Child Ratios & Group Size | 9.1 | 10 | -1.506 |
| Learning Environment | 5.8 | 6 | -0.946 |
| Training and Education | 4.7 | 5 | 0.028 |
| Program Accreditation | 0.0 | 0 | 7.548 |
| Total Star Level | 2.7 | 3 | -1.213 |

# ECELS Infant Toddler Program Quality Improvement Project (ITQIP) Report of Pre-Test Data Collection

**Richard Fiene, Ph.D.**

**August 1, 2014**

**ABSTRACT**

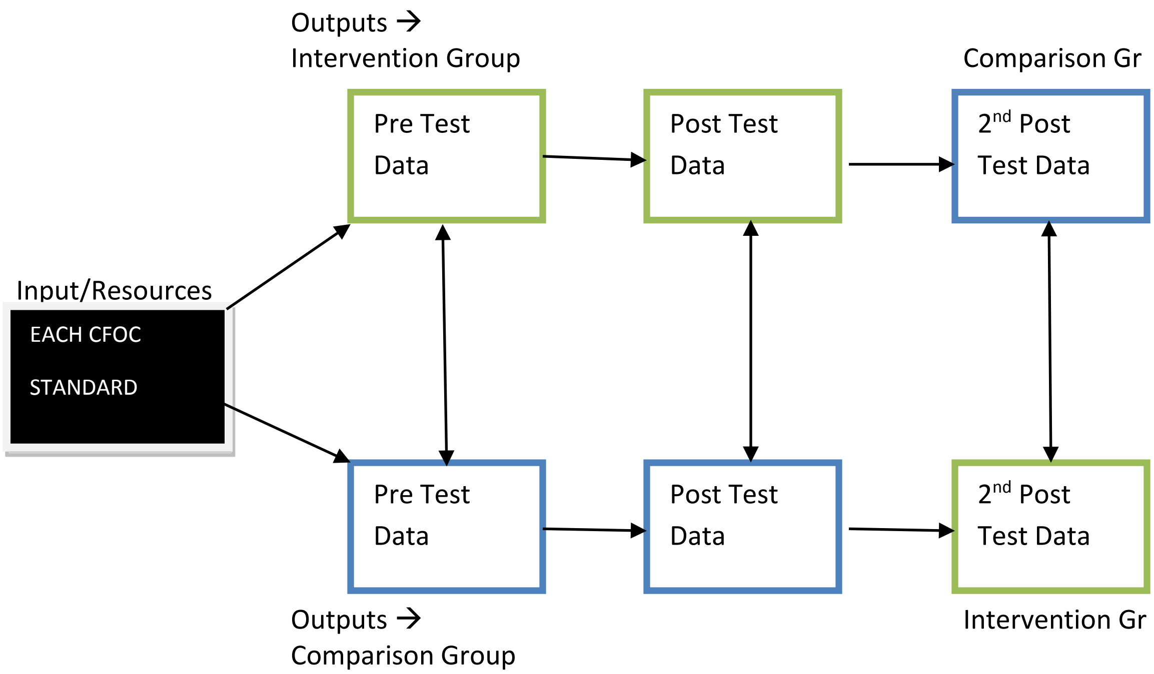
This brief report will provide an analysis of the sites selected as part of the Infant Toddler Program Quality Improvement Project (ITQIP) in the Pre-Test data collection phase.

## INTRODUCTION

This report is the initial analysis looking at the pre-test scores between the 16 intervention sites and the 16 control sites. This will be a descriptive report demonstrating the likenesses and differences between the two groups.

The evaluation plan (see Figure 1 for the Logic Model Display) is a classic randomly assigned clinical trial in which a group of child care programs will be randomly assigned to the intervention group in receiving the specific training and technical assistance specific to the selected CFOC3 standards. A comparison group also randomly assigned will receive the typical training and technical assistance that is available through the state training system. These two groups will be compared on the pre-test for equivalency and then one year later in a post-test format. At this point the intervention group will be switched to a comparison format and the comparison group will become the intervention group. If funding can be found to pay for it, a second post-test would be performed at this data point to determine the latent effects of the training/technical assistance.

**Figure 1: LOGIC MODEL** that supports the evaluation plan




**RESULTS of Pre-Test**

**Intervention Group**
The range in scores was 175 to 267 with an average score of 208 out of a possible 322 points (65%).

**Control Group**
The range in scores was 164 to 271 with an average score of 219 out of a possible 322 points (68%).

The results clearly demonstrate that there are no significant differences between the two groups on the pre-test scores with the exception of three items (SS 240, CA310, CA42).

**Intervention and Control Group Comparisons**

| Item | Intervention Group | Control Group | Differences |
|---|---|---|---|
| TOTAL | 208 | 219 | ns |
| OBSERVE | 142 | 145 | ns |
| INTERVIEW | 50 | 54 | ns |
| DOCUMENTS | 18 | 21 | ns |
| EDUCATION | CDA = 1<br>AA = 3<br>BA = 8<br>MA = 3 | CDA = 0<br>AA = 3<br>BA = 10<br>MA = 3 | |
| AREA | ECE = 8<br>ELEM = 5<br>HS = 1<br>OTHER = 1 | ECE = 8<br>ELEM = 2<br>HS = 6<br>OTHER = 0 | |
| EXPERIENCE | 8.4 years | 5.4 years | ns |
| CENTER | 13.4 years | 16.1 years | ns |
| LEGAL | NONPROFIT = 5<br>PROFIT = 11 | NONPROFIT = 7<br>PROFIT = 9 | |
| STAFF | 24 | 24 | ns |
| CHILDREN | 117 | 108 | ns |
| PR21 OBS | 2.56 | 2.75 | ns |
| PR22 | 2.75 | 2.81 | ns |
| PR23 | 2.75 | 2.88 | ns |
| PR24 | 2.94 | 2.81 | ns |
| PR25 | 2.63 | 2.88 | ns |
| LA26 | 2.31 | 2.88 | ns |
| LA27 | 2.75 | 2.87 | ns |
| LA28 | 2.47 | 2.80 | ns |
| AO29 | 2.29 | 2.69 | ns |
| AO210 | 2.81 | 2.06 | ns |
| AO211 | 0.00 | 0.19 | ns |
| AO212 | 0.40 | 0.60 | ns |
| AO213 | 1.46 | 0.44 | ns |
| AO214 | 2.44 | 2.20 | ns |
| AO215 | 2.81 | 2.79 | ns |
| AO216 | 2.81 | 2.63 | ns |
| AO217 | 2.47 | 1.67 | ns |
| AO218 | 2.81 | 2.81 | ns |
| AO219 | 0.38 | 1.00 | ns |
| AO220 | 2.13 | 2.31 | ns |
| AO221 | 1.94 | 2.20 | ns |
| AO222 | 3.00 | 2.63 | ns |

| | | | |
|---|---|---|---|
| AO223 | 2.44 | 2.06 | ns |
| AO224 | 2.69 | 2.31 | ns |
| AO225 | 2.88 | 2.75 | ns |
| AO226 | 2.25 | 2.06 | ns |
| SS227 | 1.80 | 2.63 | ns |
| SS228 | 2.53 | 2.88 | ns |
| SS229 | 3.00 | 3.00 | ns |
| SS230 | 1.73 | 2.25 | ns |
| SS231 | 3.00 | 3.00 | ns |
| SS232 | 2.40 | 3.00 | ns |
| SS233 | 2.25 | 3.00 | ns |
| SS234 | 3.00 | 3.00 | ns |
| SS235 | 2.88 | 2.80 | ns |
| SS236 | 3.00 | 2.60 | ns |
| SS237 | 3.00 | 2.75 | ns |
| SS238 | 2.20 | 2.20 | ns |
| SS239 | 3.00 | 3.00 | ns |
| SS240 | 2.00 | 2.80 | .05 |
| DC241 | 1.50 | 1.56 | ns |
| DC242 | 3.00 | 3.00 | ns |
| DC243 | 2.69 | 2.38 | ns |
| DC244 | 2.00 | 2.63 | ns |
| DC245 | 2.56 | 2.81 | ns |
| DC246 | 3.00 | 2.56 | ns |
| DC247 | 1.20 | 2.33 | ns |
| DC248 | 2.80 | 2.80 | ns |
| DC249 | 2.13 | 2.00 | ns |
| DC250 | 2.87 | 2.94 | ns |
| DC251 | 3.00 | 3.00 | ns |
| DC252 | 2.75 | 2.53 | ns |
| DC253 | 3.00 | 3.00 | ns |
| DC254 | 2.88 | 2.56 | ns |
| DC255 | 2.56 | 2.75 | ns |
| DC256 | 2.07 | 2.44 | ns |
| HH257 | 2.25 | 2.27 | ns |
| HH258 | 0.81 | 1.19 | ns |
| HH259 | 2.31 | 1.81 | ns |
| HH260 | 1.25 | 0.81 | ns |
| HH261 | 2.38 | 2.27 | ns |
| HH262 | 1.13 | 1.38 | ns |
| HH263 | 2.44 | 2.44 | ns |
| HH264 | 1.25 | 1.69 | ns |
| CA31 INTER | 1.60 | 0.86 | ns |
| CA32 | 2.00 | 2.54 | ns |
| CA33 | 2.73 | 2.71 | ns |

| | | | |
|---|---|---|---|
| PR34 | 2.47 | 2.81 | ns |
| PR35 | 1.94 | 2.25 | ns |
| AO36 | 0.19 | 0.75 | ns |
| AO37 | 0.88 | 0.80 | ns |
| SN38 | 0.29 | 0.25 | ns |
| SN39 | 0.60 | 1.00 | ns |
| CA310 | 1.24 | 2.06 | .05 |
| CA311 | 1.94 | 2.20 | ns |
| CA312 | 2.94 | 2.94 | ns |
| PR313 | 2.82 | 3.00 | ns |
| PR314 | 2.59 | 2.63 | ns |
| AO315 | 0.35 | 0.94 | ns |
| AO316 | 2.12 | 2.60 | ns |
| SN317 | 0.77 | 0.75 | ns |
| SN318 | 1.13 | 1.00 | ns |
| CA319 | 1.63 | 2.19 | ns |
| CA320 | 2.12 | 2.40 | ns |
| CA321 | 3.00 | 3.00 | ns |
| MA322 | 3.00 | 3.00 | ns |
| MA323 | 2.94 | 2.93 | ns |
| MA324 | 3.00 | 2.80 | ns |
| MA325 | 2.94 | 3.00 | ns |
| MA326 | 2.38 | 3.00 | ns |
| MA327 | 2.44 | 3.00 | ns |
| MA328 | 2.19 | 2.07 | ns |
| CA41 DOCS | 1.77 | 1.94 | ns |
| CA42 | 0.59 | 1.44 | .05 |
| CA43 | 1.77 | 1.94 | ns |
| CA44 | 2.29 | 2.38 | ns |
| SS45 | 0.53 | 0.75 | ns |
| SS46 | 0.53 | 1.07 | ns |
| SS47 | 0.88 | 0.60 | ns |
| SS48 | 0.53 | 0.75 | ns |
| SS49 | 2.60 | 2.60 | ns |
| MA410 | 0.47 | 0.87 | ns |
| IM411 | 2.94 | 2.44 | ns |
| IM412 | 0.82 | 2.80 | ns |
| IM413 | 1.41 | 1.25 | ns |
| IM414 | 0.42 | 0.63 | ns |

ns = not significant.

# ECELS Infant Toddler Program Quality Improvement Project (ITQIP)

**Richard Fiene, Ph.D.**

**September 1, 2015**


**ABSTRACT**

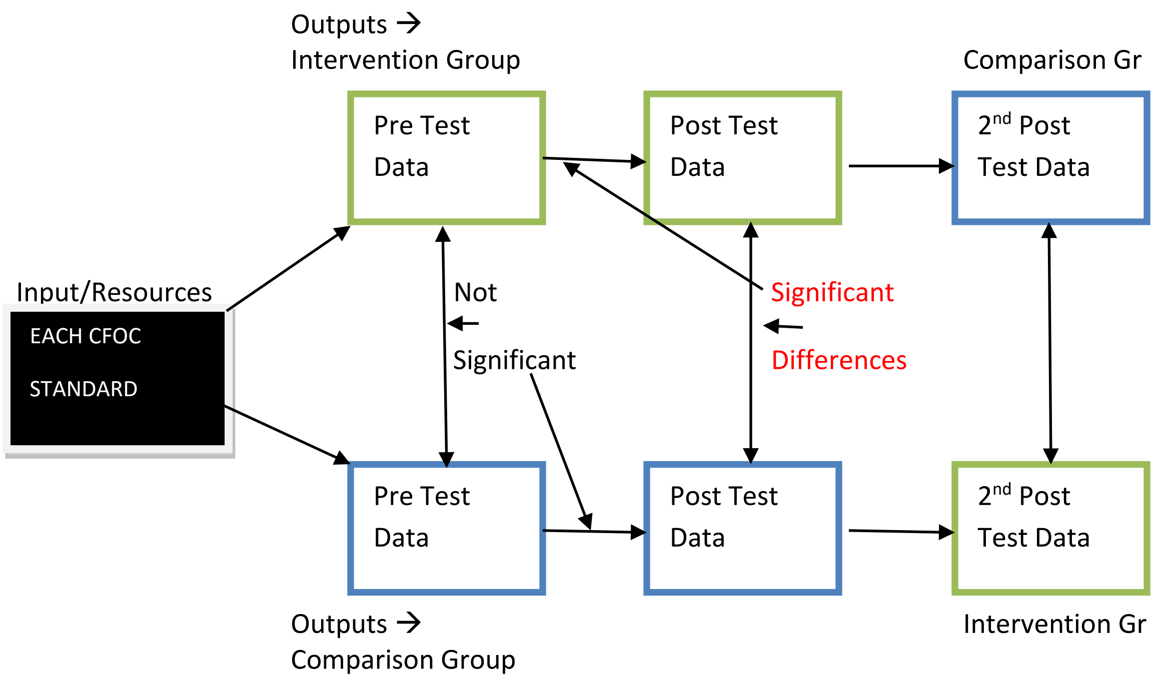
This brief report provides an analysis of the sites selected as part of the Infant Toddler Program Quality Improvement Project (ITQIP) in comparing data from the pre-test to post-test for both the Intervention and Control Groups. It is clearly demonstrated in the results that the Intervention Group was very effective in producing change in making sure children were being immunized, proper medication administration and sleep policies, identifying child abuse and prevention, proper adult hygiene and proper diapering, and ensuring infant and toddler activities and outdoor play.


## INTRODUCTION

This report compares pre-test and post-test scores between the 13 intervention sites and the 16 control sites of the Infant Toddler Program Quality Improvement Project. This will be a descriptive report demonstrating the likenesses and differences between the two groups.

The evaluation plan (see Figure 1 for the Logic Model Display) is a classic randomly assigned clinical trial in which a group of child care programs will be randomly assigned to the intervention group in receiving the specific training and technical assistance specific to the selected CFOC3 standards. A comparison group also randomly assigned will receive the typical training and technical assistance that is available through the state training system. These two groups will be compared on the pre-test for equivalency and then one year later in a post-test format. At this point the intervention group will be switched to a comparison format and the comparison group will become the intervention group. If funding can be found to pay for it, a second post-test would be performed at this data point to determine the latent effects of the training/technical assistance.

**Figure 1: LOGIC MODEL** that supports the evaluation plan




**RESULTS of Pre-Test to Post-Test (Summary and Detailed Item Results)**

**Intervention Group**
The range in scores was 175 to 267 with an average score of 212 out of a possible 322 points (66%) on the pre-test. The range in scores was 213 to 297 with an average score of 254 out of a possible 322 points (79%) on the post-test. This change from pre-test to post-test was statistically significant ($t = -4.62$; $p < .0001$).

**Control/Comparison Group**
The range in scores was 164 to 271 with an average score of 218 out of a possible 322 points (68%) on the pre-Test. The range in scores was 149 to 257 with an average score of 221 out of a possible 322 points (69%) on the post-test. All these changes from pre- to post-test were non-significant.

**Intervention – Control/Comparison Groups**
The average scores between the Intervention (212) and Control (218) groups on the pre-test were non-significant. The average scores between the Intervention (254) and Control (221) groups on the post-test were statistically significant ($t = -3.46$; $p < .002$).

**Intervention (I) and Control (C) Group Comparisons from Pre-Test to Post-Test Significant Changes Based Upon t-test Analyses and Comparisons of Intervention & Control Groups at Post-Test for Each Item (NS = Not Significant; S = Significant)**

| Item | Intervention Group (I) | Control Group (C) | Intervention - Control |
|---|---|---|---|
| PR21 OBS | NS | NS | NS |
| PR22 | NS | NS | NS |
| PR23 | NS | NS | NS |
| PR24 | NS | NS | NS |
| PR25 | NS | NS | NS |
| LA26 | NS | NS | NS |
| LA27 | NS | NS | NS |
| LA28 | NS | NS | NS |
| AO29 | NS | NS | NS |
| AO210 | NS | NS | NS |
| AO211 | NS | NS | **S*** |
| AO212 | **S*** | NS | NS |
| AO213 | NS | NS | NS |
| AO214 | NS | NS | NS |
| AO215 | NS | NS | NS |
| AO216 | NS | NS | NS |
| AO217 | NS | NS | NS |
| AO218 | NS | NS | NS |
| AO219 | **S**** | NS | NS |
| AO220 | NS | NS | NS |
| AO221 | NS | NS | NS |
| AO222 | NS | NS | NS |
| AO223 | NS | NS | NS |
| AO224 | NS | NS | NS |
| AO225 | NS | NS | NS |
| AO226 | NS | NS | NS |
| SS227 | NS | NS | NS |
| SS228 | NS | NS | NS |
| SS229 | NS | NS | NS |
| SS230 | NS | NS | NS |
| SS231 | NS | NS | NS |
| SS232 | NS | NS | NS |
| SS233 | NS | NS | NS |
| SS234 | NS | NS | NS |
| SS235 | NS | NS | NS |
| SS236 | NS | NS | NS |
| SS237 | NS | NS | NS |
| SS238 | NS | NS | NS |

| | | | |
|---|---|---|---|
| SS239 | NS | NS | NS |
| SS240 | NS | NS | NS |
| DC241 | **S*** | NS | **S**** |
| DC242 | NS | NS | NS |
| DC243 | NS | NS | NS |
| DC244 | NS | NS | NS |
| DC245 | NS | NS | NS |
| DC246 | NS | NS | NS |
| DC247 | NS | NS | NS |
| DC248 | NS | NS | NS |
| DC249 | NS | NS | **S*** |
| DC250 | NS | NS | NS |
| DC251 | NS | NS | NS |
| DC252 | NS | NS | NS |
| DC253 | NS | NS | NS |
| DC254 | NS | NS | NS |
| DC255 | NS | NS | NS |
| DC256 | NS | NS | NS |
| HH257 | NS | NS | NS |
| HH258 | NS | NS | NS |
| HH259 | NS | NS | NS |
| HH260 | NS | NS | NS |
| HH261 | NS | NS | **S*** |
| HH262 | NS | NS | NS |
| HH263 | NS | NS | **S**** |
| HH264 | NS | NS | NS |
| CA31 INTER | NS | **S**** | NS |
| CA32 | NS | NS | NS |
| CA33 | NS | NS | NS |
| PR34 | NS | NS | NS |
| PR35 | NS | NS | NS |
| AO36 | S** | NS | **S*** |
| AO37 | S* | NS | **S*** |
| SN38 | NS | NS | NS |
| SN39 | NS | NS | NS |
| CA310 | **S***** | NS | NS |
| CA311 | NS | NS | NS |
| CA312 | NS | NS | NS |
| PR313 | NS | NS | NS |
| PR314 | NS | NS | NS |
| AO315 | **S**** | NS | **S*** |
| AO316 | NS | NS | NS |
| SN317 | NS | NS | NS |
| SN318 | NS | NS | NS |
| CA319 | **S**** | NS | NS |

| | | | |
|---|---|---|---|
| CA320 | NS | NS | NS |
| CA321 | NS | NS | NS |
| MA322 | NS | NS | NS |
| MA323 | NS | NS | NS |
| MA324 | NS | NS | NS |
| MA325 | NS | NS | NS |
| MA326 | NS | NS | NS |
| MA327 | NS | NS | NS |
| MA328 | NS | NS | NS |
| CA41 DOCS | NS | NS | NS |
| CA42 | NS | NS | NS |
| CA43 | **S*** | NS | NS |
| CA44 | **S*** | NS | NS |
| SS45 | **S**** | NS | **S***** |
| SS46 | **S**** | NS | **S*** |
| SS47 | **S*** | NS | **S*** |
| SS48 | **S*** | NS | NS |
| SS49 | NS | NS | NS |
| MA410 | **S***** | NS | **S***** |
| IM411 | NS | NS | NS |
| IM412 | NS | NS | NS |
| IM413 | NS | NS | **S*** |
| SN414 | NS | NS | NS |

*** p < .05**
**** p < .01**
***** p < .001**

**DISCUSSION**

It is clear from the results that the intervention was very effective in the pre to post-test scores on a number of items (N = 15) that showed a statistically significant change from pre- to post-test for the Intervention Group and 13 items in comparing the Intervention Group to the Control Group also showed a statistically significant change. At the same time there was only one item in the Control/Comparison Group that showed a statistically significant change from pre- to post-test. As a footnote, there were also only 3 items that showed a statistically significant difference between the Intervention and Control Groups on the pre-test (Fiene, 2014).

These results are rather robust given the small sample size (N = 13 for the Intervention Group and N = 16 for the Control Group). This specific intervention utilizing Community Health Care Consultants is a viable coaching/mentoring intervention that needs additional exploration in replication studies. At least when it comes to *Caring for Our Children* standards this is a first demonstration of an effective training/technical assistance/coaching/mentoring intervention.

The intervention appeared to be most effective in making improvements in the following areas:

- children being immunized,
- proper medication administration,
- sleep policies,
- identifying child abuse and prevention,
- adult hygiene and proper diapering,
- infant and toddler activities and outdoor play.

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# ECELS Infant Toddler Program Quality Improvement Project (ITQIP)

**Richard Fiene, Ph.D.**

**August 15, 2016**

**ABSTRACT**

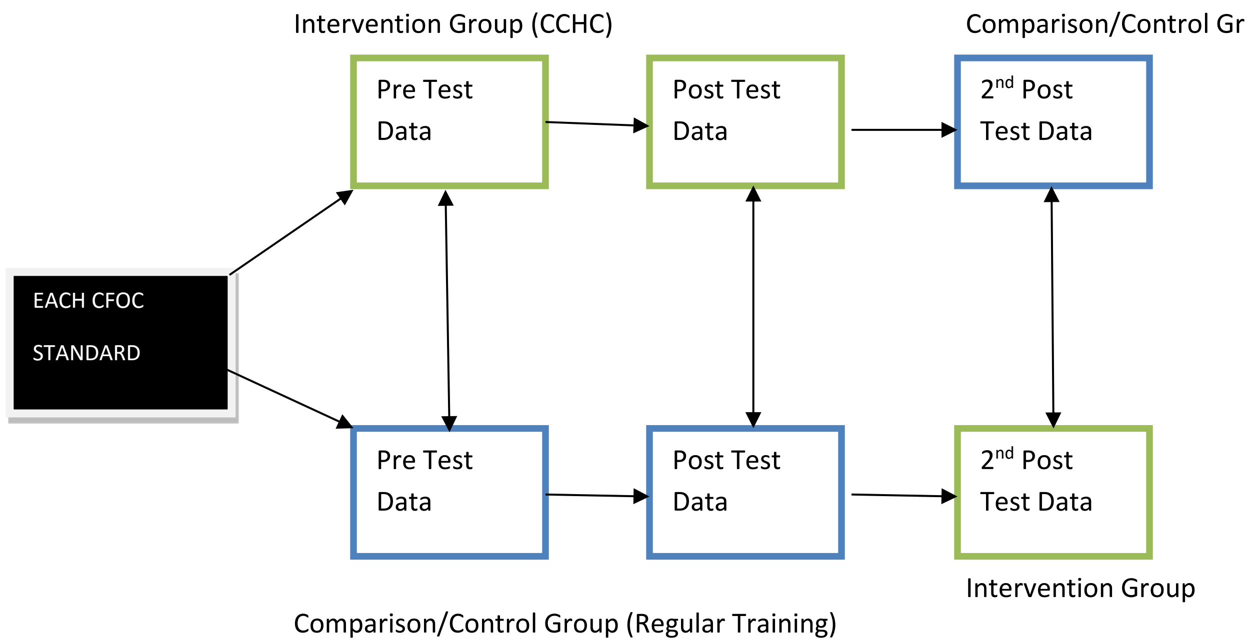
This brief report provides an analysis of the sites selected as part of the Early Childhood Education Linkage System (ECELS) Infant Toddler Program Quality Improvement Project (ITQIP) in comparing data from the pre-test to two post-tests for both the Intervention and Control Groups. It is clearly demonstrated in the results that the Intervention Group was very effective in producing change in selected health and safety standards from *Caring for Our Children*, such as: making sure children were being immunized; received training on proper medication administration; received and reviewed safe sleep policies and have been trained; were provided the necessary education, policies, and procedures for child abuse and prevention; followed proper adult hygiene and proper diapering protocols; and ensured infants and toddlers had adequate activities and outdoor play. This result occurred in both interventions: Intervention to Control and Control to Intervention.

## INTRODUCTION

This report compares pre-test and two post-test scores of the 13 intervention sites and 13 control sites enrolled in an Infant Toddler Program Quality Improvement Project. This is a descriptive report demonstrating the similarities and differences between the two groups.

The evaluation plan (see Figure 1 for the Logic Model Display) is a classic randomly assigned clinical trial in which a group of child care programs were randomly assigned to the intervention group to receive the training and technical assistance specifically targeted to selected *Caring for Our Children (3rd Edition) CFOC3* standards. A comparison group also randomly assigned had access to the typical training and technical assistance that is available through the state training system in Pennsylvania. These two groups were compared on the pre-test for equivalency and then one year later in a post-test format. At that point the intervention group was switched to a cross-over comparison format and the comparison group was switched to the intervention group. The second post-test showed a significant positive change when the previous control group became the intervention group for this phase of the evaluation. Persistent effects of the training/technical assistance specifically targeted to the selected standards were found for the original intervention group.

**Figure 1: EVALUATION PLAN LOGIC MODEL**



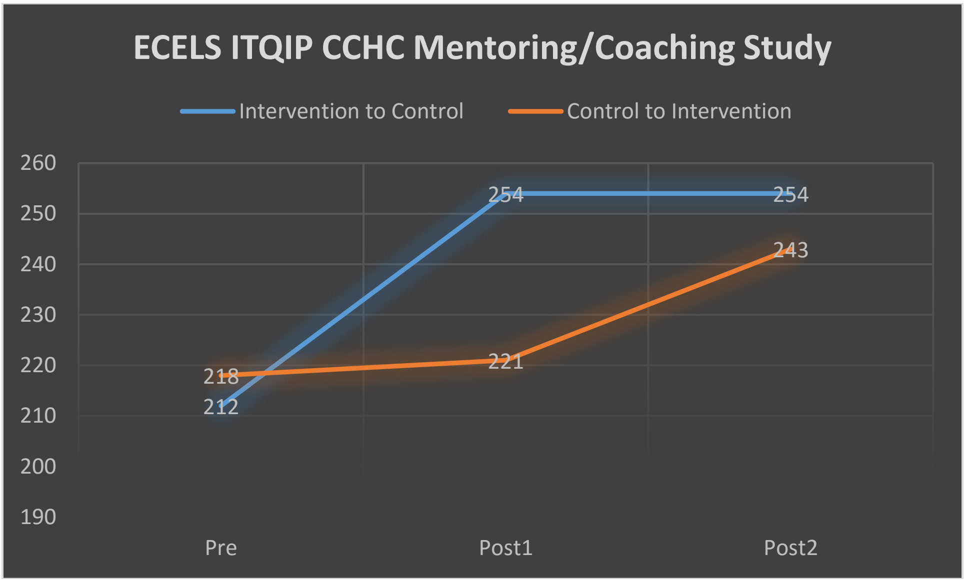

**RESULTS of Pre-Test to the two Post-Tests**

**Intervention Group**
On the pre-test, the range in scores was 175 to 267 with an average score of 212 out of a possible 322 points (66%). On the post-test, the range in scores was 213 to 297 with an average score of 254 out of a possible 322 points (79%). This change from pre-test to post-test was statistically significant ($t = -4.62$; $p < .0001$). The second post-test did not show any significant change but the initial results from the intervention were maintained (254 to 254).

**Control/Comparison Group**
The range in scores was 164 to 271 with an average score of 218 out of a possible 322 points (68%) on the pre-Test. The range in scores was 149 to 257 with an average score of 221 out of a possible 322 points (69%) on the first post-test. All these changes from pre- to post-test were non-significant. The second post test showed significant change from the previous initial post-test to the second post-test (221 to 243)($t = -1.80$; $p < .08$) when this group received the intervention.

**Intervention – Control/Comparison Groups**
The average scores between the Intervention (212) and Control (218) groups on the pre-test were non-significant. The average scores between the Intervention (254) and Control (221) groups on the post-test were statistically significant ($t = -3.46$; $p < .002$). The second post test showed no

significant difference between the post-intervention scores for the initial intervention group and the control/comparison (delayed intervention) group change (254 vs 243).




The above graph depicts the relationship between the Intervention and the Control groups in a Crossover design. It clearly demonstrates how effective the intervention (Pre to Post1) was for the original intervention group and that the effects were persistent effects (Post1 to Post2). It also shows that the intervention was effective when the control group was switched to be the intervention group and received the targeted training and technical assistance in a delayed fashion after their pre-test assessment. (Post1 to Post2).

**DISCUSSION**

It is clear from the results that the intervention of working with the Child Care Health Consultants (CCHC) was very effective in the pre to post-test scores. This intervention helped to improve the overall quality of specifically targeted health standards, such as: making sure children were being immunized; receiving training for proper medication administration; receiving and reviewing safe sleep policies and training; receiving the necessary education, policies, and procedures for preventing and recognizing child abuse; following proper adult hygiene and proper diapering protocols; and ensuring infants and toddlers had adequate activities and outdoor play. This occurred in both the original intervention and when the control group was switched to a delayed intervention group. This is a very significant finding because it clearly demonstrates the strength of this intervention (CCHC coaching/mentoring) and its lasting value i.e. the original intervention group sustained its original quality gains.

This specific intervention utilizing CCHCs is a viable coaching/mentoring intervention that needs additional exploration in replication studies. At least when it comes to *Caring for Our Children* standards this is a demonstration that CCHC consultation is an effective training/technical assistance/coaching/mentoring intervention. See the details in the following appendices.

## Appendix A

### Group A (Intervention crossover to Control) – Post1 to Post2 Comparisons

| Item | Post1 | Post2 | Differences |
|---|---|---|---|
| PR21 OBS | 2.92 | 2.85 | ns |
| PR22 | 2.85 | 3.00 | ns |
| PR23 | 3.00 | 2.85 | ns |
| PR24 | 3.00 | 3.00 | ns |
| PR25 | 2.77 | 3.00 | ns |
| LA26 | 2.85 | 2.75 | ns |
| LA27 | 2.85 | 3.00 | ns |
| LA28 | 2.92 | 2.62 | ns |
| AO29 | 2.67 | 2.57 | ns |
| AO210 | 2.75 | 1.85 | ns |
| AO211 | 1.91 | 1.85 | ns |
| AO212 | 1.64 | 2.08 | ns |
| AO213 | 2.00 | 1.50 | ns |
| AO214 | 2.77 | 2.77 | ns |
| AO215 | 2.75 | 2.77 | ns |
| AO216 | 2.85 | 2.92 | ns |
| AO217 | 2.73 | 2.60 | ns |
| AO218 | 2.77 | 2.77 | ns |
| AO219 | 1.91 | 1.62 | ns |
| AO220 | 2.58 | 2.75 | ns |
| AO221 | 2.18 | 2.75 | ns |
| AO222 | 3.00 | 2.75 | ns |
| AO223 | 3.00 | 2.73 | ns |
| AO224 | 2.54 | 2.92 | ns |
| AO225 | 3.00 | 3.00 | ns |
| AO226 | 2.54 | 2.50 | ns |
| SS227 | 2.69 | 2.62 | ns |

| | | | |
|---|---|---|---|
| SS228 | 2.92 | 3.00 | ns |
| SS229 | 3.00 | 3.00 | ns |
| SS230 | 2.31 | 2.46 | ns |
| SS231 | 2.85 | 3.00 | ns |
| SS232 | 3.00 | 3.00 | ns |
| SS233 | 2.13 | 2.30 | ns |
| SS234 | 3.00 | 3.00 | ns |
| SS235 | 3.00 | 2.77 | ns |
| SS236 | 3.00 | 3.00 | ns |
| SS237 | 3.00 | 3.00 | ns |
| SS238 | 1.77 | 1.92 | ns |
| SS239 | 3.00 | 3.00 | ns |
| SS240 | 2.11 | 2.23 | ns |
| DC241 | 2.73 | 1.54 | .05 |
| DC242 | 2.92 | 3.00 | ns |
| DC243 | 2.67 | 2.85 | ns |
| DC244 | 2.39 | 2.62 | ns |
| DC245 | 2.92 | 2.62 | ns |
| DC246 | 3.00 | 2.69 | ns |
| DC247 | 3.00 | 3.00 | ns |
| DC248 | 3.00 | 2.69 | ns |
| DC249 | 2.31 | 2.31 | ns |
| DC250 | 3.00 | 3.00 | ns |
| DC251 | 3.00 | 3.00 | ns |
| DC252 | 2.69 | 2.39 | ns |
| DC253 | 3.00 | 3.00 | ns |
| DC254 | 3.00 | 2.46 | ns |
| DC255 | 3.00 | 2.92 | ns |
| DC256 | 3.00 | 2.92 | ns |
| HH257 | 2.46 | 2.39 | ns |
| HH258 | 1.62 | 2.54 | ns |
| HH259 | 2.23 | 1.69 | ns |
| HH260 | 1.54 | 2.23 | ns |
| HH261 | 2.77 | 2.39 | ns |
| HH262 | 1.77 | 2.23 | ns |
| HH263 | 2.69 | 2.31 | ns |
| HH264 | 1.69 | 2.62 | ns |
| CA31 INTER | 3.00 | 3.00 | ns |
| CA32 | 3.00 | 2.67 | ns |
| CA33 | 3.00 | 3.00 | ns |
| PR34 | 3.00 | 2.77 | ns |
| PR35 | 2.54 | 2.54 | ns |
| AO36 | 1.62 | 1.39 | ns |
| AO37 | 2.31 | 2.08 | ns |

| | | | |
|---|---|---|---|
| SN38 | 0.15 | 0.31 | ns |
| SN39 | 0.00 | 0.00 | ns |
| CA310 | 2.77 | 2.77 | ns |
| CA311 | 2.54 | 2.77 | ns |
| CA312 | 2.92 | 2.77 | ns |
| PR313 | 3.00 | 2.77 | ns |
| PR314 | 2.84 | 2.85 | ns |
| AO315 | 1.85 | 1.62 | ns |
| AO316 | 2.75 | 2.54 | ns |
| SN317 | 0.31 | 1.08 | ns |
| SN318 | 1.00 | 1.40 | ns |
| CA319 | 2.77 | 2.77 | ns |
| CA320 | 2.54 | 2.77 | ns |
| CA321 | 2.92 | 2.77 | ns |
| MA322 | 3.00 | 3.00 | ns |
| MA323 | 2.54 | 2.92 | ns |
| MA324 | 3.00 | 3.00 | ns |
| MA325 | 3.00 | 3.00 | ns |
| MA326 | 2.31 | 3.00 | ns |
| MA327 | 2.77 | 3.00 | ns |
| MA328 | 2.46 | 2.67 | ns |
| CA41 DOCS | 3.00 | 2.85 | ns |
| CA42 | 1.33 | 1.85 | ns |
| CA43 | 2.75 | 3.00 | ns |
| CA44 | 2.92 | 2.92 | ns |
| SS45 | 1.92 | 2.08 | ns |
| SS46 | 2.08 | 2.31 | ns |
| SS47 | 2.31 | 2.23 | ns |
| SS48 | 1.62 | 2.23 | ns |
| SS49 | 2.77 | 2.75 | ns |
| MA410 | 2.54 | 2.25 | ns |
| IM411 | 2.62 | 2.67 | ns |
| IM412 | 1.23 | 0.85 | ns |
| IM413 | 1.54 | 1.31 | ns |
| SN414 | 1.14 | 1.43 | ns |

ns = not significant.

**Appendix B**

**Group B (Control Crossover to Intervention) – Post1 to Post2 Comparisons**

| Item | Post1 | Post2 | Differences |
|---|---|---|---|
| PR21 OBS | 2.81 | 3.00 | ns |
| PR22 | 2.75 | 2.92 | ns |
| PR23 | 2.81 | 2.85 | ns |
| PR24 | 2.94 | 2.92 | ns |
| PR25 | 2.81 | 3.00 | ns |
| LA26 | 2.31 | 2.46 | ns |
| LA27 | 2.56 | 2.92 | ns |
| LA28 | 2.75 | 2.69 | ns |
| AO29 | 2.40 | 2.40 | ns |
| AO210 | 3.00 | 2.77 | ns |
| AO211 | 0.56 | 0.50 | ns |
| AO212 | 0.60 | 1.62 | ns |
| AO213 | 0.82 | 1.88 | ns |
| AO214 | 3.00 | 2.77 | ns |
| AO215 | 3.00 | 2.77 | ns |
| AO216 | 2.94 | 2.92 | ns |
| AO217 | 2.62 | 2.67 | ns |
| AO218 | 3.00 | 3.00 | ns |
| AO219 | 1.31 | 2.00 | ns |
| AO220 | 2.13 | 2.75 | ns |
| AO221 | 2.31 | 2.92 | ns |
| AO222 | 3.00 | 2.77 | ns |
| AO223 | 2.60 | 2.77 | ns |
| AO224 | 2.25 | 2.77 | ns |
| AO225 | 2.81 | 2.69 | ns |
| AO226 | 2.06 | 2.50 | ns |

| | | | |
|---|---|---|---|
| SS227 | 1.88 | 2.46 | ns |
| SS228 | 2.75 | 2.92 | ns |
| SS229 | 3.00 | 3.00 | ns |
| SS230 | 1.94 | 2.77 | .05 |
| SS231 | 3.00 | 3.00 | ns |
| SS232 | 2.63 | 2.77 | ns |
| SS233 | 2.69 | 2.50 | ns |
| SS234 | 2.94 | 3.00 | ns |
| SS235 | 2.80 | 2.36 | ns |
| SS236 | 2.90 | 3.00 | ns |
| SS237 | 1.87 | 2.85 | ns |
| SS238 | 1.27 | 2.25 | .05 |
| SS239 | 2.81 | 3.00 | ns |
| SS240 | 2.21 | 2.50 | ns |
| DC241 | 1.27 | 1.31 | ns |
| DC242 | 2.93 | 2.92 | ns |
| DC243 | 2.00 | 2.91 | .05 |
| DC244 | 2.50 | 2.62 | ns |
| DC245 | 2.63 | 2.54 | ns |
| DC246 | 2.88 | 2.92 | ns |
| DC247 | 1.20 | 1.80 | ns |
| DC248 | 2.62 | 2.60 | ns |
| DC249 | 1.56 | 1.77 | ns |
| DC250 | 3.00 | 2.62 | ns |
| DC251 | 3.00 | 3.00 | ns |
| DC252 | 2.50 | 2.23 | ns |
| DC253 | 3.00 | 3.00 | ns |
| DC254 | 2.44 | 2.62 | ns |
| DC255 | 2.75 | 2.69 | ns |
| DC256 | 2.63 | 2.46 | ns |
| HH257 | 2.06 | 2.31 | ns |
| HH258 | 1.38 | 1.54 | ns |
| HH259 | 2.25 | 2.46 | ns |
| HH260 | 1.63 | 1.62 | ns |
| HH261 | 2.33 | 2.08 | ns |
| HH262 | 1.63 | 1.77 | ns |
| HH263 | 2.06 | 2.08 | ns |
| HH264 | 1.27 | 1.69 | ns |
| CA31 INTER | 2.62 | 2.57 | ns |
| CA32 | 3.00 | 3.00 | ns |
| CA33 | 3.00 | 3.00 | ns |
| PR34 | 2.44 | 3.00 | ns |
| PR35 | 2.06 | 2.54 | ns |
| AO36 | 0.19 | 0.23 | ns |

| | | | |
|---|---|---|---|
| AO37 | 0.94 | 0.92 | ns |
| SN38 | 0.36 | 0.39 | ns |
| SN39 | 0.60 | 0.00 | ns |
| CA310 | 2.75 | 2.92 | ns |
| CA311 | 2.81 | 3.00 | ns |
| CA312 | 2.94 | 2.92 | ns |
| PR313 | 2.63 | 3.00 | ns |
| PR314 | 2.69 | 2.62 | ns |
| AO315 | 0.75 | 1.39 | ns |
| AO316 | 2.63 | 2.77 | ns |
| SN317 | 0.71 | 1.39 | ns |
| SN318 | 0.00 | 1.38 | ns |
| CA319 | 2.81 | 2.85 | ns |
| CA320 | 2.44 | 3.00 | ns |
| CA321 | 2.81 | 2.92 | ns |
| MA322 | 2.80 | 2.72 | ns |
| MA323 | 2.33 | 3.00 | ns |
| MA324 | 2.87 | 3.00 | ns |
| MA325 | 3.00 | 3.00 | ns |
| MA326 | 2.67 | 3.00 | ns |
| MA327 | 2.13 | 2.91 | .05 |
| MA328 | 2.40 | 2.58 | ns |
| CA41 DOCS | 2.62 | 3.00 | ns |
| CA42 | 0.92 | 1.39 | ns |
| CA43 | 2.62 | 1.62 | ns |
| CA44 | 2.75 | 2.92 | ns |
| SS45 | 0.62 | 0.77 | .05 |
| SS46 | 0.92 | 1.46 | ns |
| SS47 | 1.15 | 1.23 | ns |
| SS48 | 0.54 | 1.62 | .05 |
| SS49 | 2.31 | 3.00 | ns |
| MA410 | 0.92 | 1.75 | ns |
| IM411 | 2.67 | 2.85 | ns |
| IM412 | 1.00 | 1.54 | ns |
| IM413 | 1.00 | 1.15 | ns |
| SN414 | 0.08 | 0.70 | .05 |

ns = not significant.

**Appendix C**

**Post2 – Group A (Control) versus Group B (Intervention) Comparisons**

| Item | Group A | Group B | Differences |
|---|---|---|---|
| PR21 OBS | 2.85 | 3.00 | ns |
| PR22 | 3.00 | 2.92 | ns |
| PR23 | 2.85 | 2.85 | ns |
| PR24 | 3.00 | 2.92 | ns |
| PR25 | 3.00 | 3.00 | ns |
| LA26 | 2.75 | 2.46 | ns |
| LA27 | 3.00 | 2.92 | ns |
| LA28 | 2.62 | 2.69 | ns |
| AO29 | 2.57 | 2.40 | ns |
| AO210 | 1.85 | 2.77 | ns |
| AO211 | 1.85 | 0.50 | .05 |
| AO212 | 2.08 | 1.62 | ns |
| AO213 | 1.50 | 1.88 | ns |
| AO214 | 2.77 | 2.77 | ns |
| AO215 | 2.77 | 2.77 | ns |
| AO216 | 2.92 | 2.92 | ns |
| AO217 | 2.60 | 2.67 | ns |
| AO218 | 2.77 | 3.00 | ns |
| AO219 | 1.62 | 2.00 | ns |
| AO220 | 2.75 | 2.75 | ns |
| AO221 | 2.75 | 2.92 | ns |
| AO222 | 2.75 | 2.77 | ns |
| AO223 | 2.73 | 2.77 | ns |
| AO224 | 2.92 | 2.77 | ns |
| AO225 | 3.00 | 2.69 | ns |

| | | | |
|---|---|---|---|
| AO226 | 2.50 | 2.50 | ns |
| SS227 | 2.62 | 2.46 | ns |
| SS228 | 3.00 | 2.92 | ns |
| SS229 | 3.00 | 3.00 | ns |
| SS230 | 2.46 | 2.77 | ns |
| SS231 | 3.00 | 3.00 | ns |
| SS232 | 3.00 | 2.77 | ns |
| SS233 | 2.30 | 2.50 | ns |
| SS234 | 3.00 | 3.00 | ns |
| SS235 | 2.77 | 2.36 | ns |
| SS236 | 3.00 | 3.00 | ns |
| SS237 | 3.00 | 2.85 | ns |
| SS238 | 1.92 | 2.25 | ns |
| SS239 | 3.00 | 3.00 | ns |
| SS240 | 2.23 | 2.50 | .05 |
| DC241 | 1.54 | 1.31 | ns |
| DC242 | 3.00 | 2.92 | ns |
| DC243 | 2.85 | 2.91 | ns |
| DC244 | 2.62 | 2.62 | ns |
| DC245 | 2.62 | 2.54 | ns |
| DC246 | 2.69 | 2.92 | ns |
| DC247 | 3.00 | 1.80 | ns |
| DC248 | 2.69 | 2.60 | ns |
| DC249 | 2.31 | 1.77 | ns |
| DC250 | 3.00 | 2.62 | ns |
| DC251 | 3.00 | 3.00 | ns |
| DC252 | 2.39 | 2.23 | ns |
| DC253 | 3.00 | 3.00 | ns |
| DC254 | 2.46 | 2.62 | ns |
| DC255 | 2.92 | 2.69 | ns |
| DC256 | 2.92 | 2.46 | ns |
| HH257 | 2.39 | 2.31 | ns |
| HH258 | 2.54 | 1.54 | ns |
| HH259 | 1.69 | 2.46 | .05 |
| HH260 | 2.23 | 1.62 | ns |
| HH261 | 2.39 | 2.08 | ns |
| HH262 | 2.23 | 1.77 | ns |
| HH263 | 2.31 | 2.08 | ns |
| HH264 | 2.62 | 1.69 | ns |
| CA31 INTER | 3.00 | 2.57 | ns |
| CA32 | 2.67 | 3.00 | ns |
| CA33 | 3.00 | 3.00 | ns |
| PR34 | 2.77 | 3.00 | ns |
| PR35 | 2.54 | 2.54 | ns |

| | | | |
|---|---|---|---|
| AO36 | 1.39 | 0.23 | .05 |
| AO37 | 2.08 | 0.92 | .05 |
| SN38 | 0.31 | 0.39 | ns |
| SN39 | 0.00 | 0.00 | ns |
| CA310 | 2.77 | 2.92 | ns |
| CA311 | 2.77 | 3.00 | ns |
| CA312 | 2.77 | 2.92 | ns |
| PR313 | 2.77 | 3.00 | ns |
| PR314 | 2.85 | 2.62 | ns |
| AO315 | 1.62 | 1.39 | ns |
| AO316 | 2.54 | 2.77 | ns |
| SN317 | 1.08 | 1.39 | ns |
| SN318 | 1.40 | 1.38 | ns |
| CA319 | 2.77 | 2.85 | ns |
| CA320 | 2.77 | 3.00 | ns |
| CA321 | 2.77 | 2.92 | ns |
| MA322 | 3.00 | 2.72 | ns |
| MA323 | 2.92 | 3.00 | ns |
| MA324 | 3.00 | 3.00 | ns |
| MA325 | 3.00 | 3.00 | ns |
| MA326 | 3.00 | 3.00 | ns |
| MA327 | 3.00 | 2.91 | ns |
| MA328 | 2.67 | 2.58 | ns |
| CA41 DOCS | 2.85 | 3.00 | ns |
| CA42 | 1.85 | 1.39 | ns |
| CA43 | 3.00 | 1.62 | ns |
| CA44 | 2.92 | 2.92 | ns |
| SS45 | 2.08 | 0.77 | ns |
| SS46 | 2.31 | 1.46 | ns |
| SS47 | 2.23 | 1.23 | ns |
| SS48 | 2.23 | 1.62 | ns |
| SS49 | 2.75 | 3.00 | ns |
| MA410 | 2.25 | 1.75 | ns |
| IM411 | 2.67 | 2.85 | ns |
| IM412 | 0.85 | 1.54 | .001 |
| IM413 | 1.31 | 1.15 | ns |
| SN414 | 1.43 | 0.70 | ns |

ns = not significant.

# Fiene's Key Indicator Statistical Methodology©

## September 13, 2013

This short paper provides the technical and statistical aspects of the Fiene key indicator methodology©. It will provide the roadmap in taking businesses through the necessary steps to generating the respective key indicators which will then predict overall successful outcomes for their respective businesses.

One of the first steps is to sort the data into high and low groups, generally the highest and lowest ratings can be used for this sorting. Frequency data will be obtained on those data elements in the top level (usually top 20-25%) and the bottom level (usually the bottom 20-25%). The middle levels are not used for the purposes of these analyses. These two groups (top level & the bottom level) are then compared to how each data element (see Figure 1). An example would be the following: let's say a business has varying levels of success in selling a specific product. Sort all the salespersons by the number in the highest group and the lowest group by successful sales. Then determine how the groups scored on specific data elements, such as number of phone calls back to each client. Sort the number of phone calls into the top 25% number of calls and the bottom 25% of calls. Fill in the cells within Figure 1 accordingly (see Figure 2).

| **Figure 1** | ***Data Element in the Top 25%*** | ***Data Element in the Bottom 25%*** | ***Row Total*** |
|---|---|---|---|
| ***Highest level (top 20-25%)*** | **A** | **B** | ***Y*** |
| ***Lowest level (bottom 20-25%)*** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | ***Grand Total*** |

Figure 2 depicts that all programs that were in the top 25% (5+ calls) were also in the highest rating while the bottom 25% (3 or fewer calls) were also in the lowest rating.

| *Figure 2* | *5+ Calls* | *3 or Fewer Calls* | *Row Total* |
|---|---|---|---|
| *Highest Level* | *117* | *0* | *117* |
| *Lowest Level* | 0 | 35 | *35* |
| *Column Total* | *117* | *35* | 152 |

Once the data are sorted in the above matrix, the following formula (Figure 3) is used to determine if Item 16 is a key indicator or not by calculating its respective Fiene coefficient. Please refer back to Figure 1 for the actual placement within the cells and Figure 2 for the data within the cells. The legend (Figure 4) below the formula shows how the cells are defined.

**Figure 3 – Formula for Fiene Coefficient**

$$\phi = (A)(D)-(B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

**Figure 4 – Legend for the Cells within the Fiene Coefficient**

***A = High Group + Data Element in High Group.***
***B = High Group + Data Element in Low Group.***
***C = Low Group + Data Element in High Group.***
***D = Low Group + Data Element in Low Group.***

***W = Total Number of Times Data Element in High Group.***
***X = Total Number of Times Data Element in Low Group.***
***Y = Total Number of Times in High Group.***
***Z = Total Number of Times in Low Group.***

Once the data are run through the formula in Figure 3, the following chart (Figure 5) can be used to make the final determination of including or not including the item as a key indicator. Based upon the chart in Figure 5, it is best to have a Fiene Coefficient approaching +1.00 if we are dealing with normally distributed data[1]. This requirement is relaxed with skewed data (+.26 and higher).

Continuing with the chart in Figure 5, if the Fiene Coefficient is between +.25 and -.25, this indicates that the indicator is unpredictable in being able to predict overall compliance with the quality rating assessment tool. Either a false positive in which the indicator appears too often in the low group as being in compliance, or a false negative in which the indicator appears too often in the high group as being out of compliance[2].

The last possible outcome with the Fiene Coefficient is if it is between -.26 and -1.00, this indicates that the indicator is a terrible predictor because it is doing just the opposite of the decision we want to make. The indicator would predominantly be in compliance with the low group rather than the high group so it would be statistically predicting overall non-compliance. This is obviously something we do not want to occur.

**Figure 5 – Thresholds for the Fiene Coefficient**

| Fiene Coefficient Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.26) | Good Predictor | Include |
| (+.25) – (-.25) | Unpredictable | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

Notes:

1. The reason for pointing out the need to have a higher Phi Coefficient than what has been reported previously is the fact that the dichotomization of data should only be used with skewed data and not normally distributed data because it will accentuate differences. However, since the purpose of the dichotomization of data is only for sorting into a high and low group, it would appear to be acceptable for this purpose (MacCallun, etal, 2002. On the practice of dichotomization of quantitative variables, *Psychological Methods, 7, 1,* 19-40.).

2. These results would show an increase in cells B and C in Figure 1 which is undesirable; it should always be the case where A + D > B + C for key indicators to maintain their predictive validity.

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

## January 2015

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** | ***Providers who fail the Key Indicator review*** | ***Providers who pass the Key Indicator review*** | ***Row Totals*** |
|---|---|---|---|
| ***Providers who fail the Comprehensive review*** | ***W*** | ***X*** | |
| ***Providers who pass the Comprehensive Review*** | **Y** | **Z** | |
| ***Column Totals*** | | | ***Grand Total*** |

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** | ***Providers who fail the Key Indicator review*** | ***Providers who pass the Key Indicator review*** | ***Row Total*** |
|---|---|---|---|
| ***Providers who fail the Comprehensive review*** | ***25*** | ***1*** | ***26*** |
| ***Providers who pass the Comprehensive Review*** | **7** | **17** | ***24*** |
| ***Column Total*** | ***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**

| Agreement Ratio Range | False Negative Range | Decision |
|---|---|---|
| (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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# The Relationship of Licensing, Head Start, Pre-K, QRIS, Accreditation, and Professional Development and their Potential Impact on Child Outcomes

**Richard Fiene, Ph.D.**

**October 11, 2013**

**ABSTRACT**

This short paper will provide some thoughts about the various public policy initiatives/systems to improve early care and education, such as licensing, Head Start, Pre-K, QRIS, accreditation, and professional development and their potential impact on child outcomes. Early care and education is at a major crossroads as a profession in attempting to determine which quality initiatives have the greatest impact on children. Results are starting to come in from early studies which may provide some guidance as policy makers begin making decisions about where to focus their limited funding resources.

Improving early care and education programs has a long public policy history as we attempt to find the most cost effective and efficient means for attaining this lofty goal. There have been many ups and downs over the years where funding was adequate and when it was not, but our desire to accomplish this goal has always been front and center. Now, as a profession, we are at somewhat of a cross-roads in determining which of the many quality initiatives appear to have the greatest impact on children's development. When I refer to children's development, I am looking at the whole child from the perspective of a child's developmental status as well as the child's health and safety.

Presently we have many quality initiatives to look at which is a very good thing since at times in the past we did not always have so many choices. Probably the one constant throughout the history of early care and education in the past century has been licensing or regulations/rule formulation. Some many argue that licensing is not a quality initiative but I would suggest that licensing has many of the structural aspects of quality that have been identified in the research literature. The other quality initiatives I will discuss have really started and been implemented in the very later part of the 20th century so we are talking about a relatively new science when we think about having its intended impact on children. Also, I am talking about large public policy initiatives rather than highly structured, single focused research studies involving small samples of children.

Let's start with licensing since this system has been present for the longest period of time. The purpose of licensing is to act as the gatekeeper to the early care and education field in which only those providers who meet specific standards, generally called rules or regulations are permitted to operate and care for children. The rules are dominated by health and safety concerns with less emphasis on curriculum planning and staff-child interactions. The rules measure more structural aspects of quality than the process aspects of quality; dealing with what attorney's call the "hard data" rather than the "soft data".

Since licensing rules allow entry into the early care and education field to provide services usually the rules are not overally stringent with the majority of providers being in high compliance if not full compliance with all the rules. This would be expected since these are basic health and safety standards. And in fact when one looks at compliance data, it is extremely skewed with the majority of providers having very high compliance scores with relatively few violations of the rules. However, this does introduce a certain difficulty in using these data for decision making purposes at an aggregate level because so many providers score at a high level it becomes increasingly difficult to distinguish between the really excellent providers and the somewhat mediocre providers. Another way of looking at this skewing of the data is to term it as a plateau effect in which there is very little variance at the upper ends of the compliance spectrum. This is a major issue with skewed data and basic standards which is an important consideration with licensing but will also be an important consideration when one looks at the other quality initiatives to be addressed shortly.

Because of this plateau effect with licensing data, it may explain much of the lack of relationships found between compliance with rules and any types of outcomes related to children's outcomes and provider's overall quality. However, with licensing data and making comparisons to children's outcomes we should be looking at general health data such as immunization status and safety data such as the number of injuries at programs with varying levels of compliance with health and safety rules.

A significant development over the past two decades has been the development of national health and safety standards with the publication of Caring for Our Children (CFOC3) and Stepping Stones (SS3). Although these standards are not required but are only recommended practice that provides guidance to states as they revise their rules, these two documents have been embraced by the licensing/regulatory administration field. Although unlikely, if not impossible, to comply with all the CFOC3 standards, it would be interesting to compare states on this set of standards which may add a good deal of variance to the basic health and safety data that has been missing with licensing rules.

The next system to look at is the national Head Start program. Out of the major programs that are national in scope, Head Start has a long history of providing services to low income children and their families. Head Start Performance Standards are definitely more stringent than licensing rules but not as stringent as accreditation standards. Based upon Head Start's more stringent standards and the additional supports that are part of its program, Head Start generally scores higher on program quality tools (e.g., CLASS or ERS) than licensed child care in states.

With Head Start programs, we at times find skewing or plateauing of data when we compare compliance with the Head Start Performance Standards (HSPS) and program quality tools such as the CLASS. However, this is dependent upon the various subscales within the CLASS in which the plateauing of data does not occur all of the time. I think that has a lot to do with the HSPS being fairly stringent standards as compared to state licensing rules in general.

A program that has gotten a good deal of support at the state level are Pre-K programs. These programs come with stricter standards than licensed child care with an emphasis on the professional development of staff. There is more concern about the process aspects of quality which focus more on teacher-child interactions. This emphasis on teacher-child interaction has paid off in which these programs generally are high performers when you compare Pre-K funded classrooms to licensed child care classrooms. In fact, Pre-K funding appears to have a positive impact on licensed child care in raising overall quality scores on the ECERS-R for all classrooms in programs that receive Pre-K funding even if some of the classrooms are not the direct beneficiaries of the funding. This is a very significant finding because we knew that Pre-K funding increased the quality of care in classrooms receiving those funds, but now, it appears that there is a spillover effect to all classrooms co-located with Pre-K funded classrooms. I must admit that I was initially skeptical when Pre-K funding was first proposed because I thought it would take funding and the focus away from improving licensed child care at the state level; but it appears that the advocates for Pre-K were right in their assertion that Pre-K would increase the quality of all early care and education which includes licensed child care.

A more recent entry into the state funding scene are QRIS (Quality Rating and Improvement Systems) which build upon licensing systems, are voluntary, and have substantial financial incentives for participating in this quality improvement system. It is too early to really determine if QRIS is having the intended impact because the program is so new (50% of states have a QRIS), and the penetration rate is usually below 50% in any given state (remember the system is voluntary). However, in the few studies done, the results are mixed. It does appear that programs which move up the various star levels do increase the quality of care they provide; but in a most recent study looking at child outcomes, no relationship was found between increasing levels of compliance with QRIS standards and how well children did in those programs with the exception of CLASS scores in which teacher-child interactions were measured and emphasized – here there were significant relationships between higher scores on the CLASS and child outcomes.

Accreditation systems come in many varieties but there are only three that I know of in which empirical studies have been done to validate their systems: NAEYC, NECPA for centers and NAFDC for homes. Also reliability testing has been done in each of these systems. Accreditation is a rigorous self-study that really improves programs through the self-study process. This should come as no surprise because we have known for some time that program monitoring all by itself leads to program improvements. Now when you couple that with technical assistance you see even more improvement. Accreditation is usually the other pillar of a QRIS system with licensing being the first pillar. The QRIS standards fill the gap from licensing to accreditation. Accreditation is a voluntary system just as in most cases with QRIS. However, in accreditation we are reaching less than 10% of the programs with the majority of these attaining NAEYC accreditation. NECPA and NAFDC have much smaller market shares.

The last system to be addressed is the professional development systems that have been established in all states. This is one quality improvement initiative that has 100% penetration in all states. It is usually tied to QRIS through technical assistance and mentoring (coaching). When it focuses on mentoring rather than workshops, it has demonstrated its effectiveness in changing teachers behaviors in how they interact with children in their care in a very positive fashion. This is very important because the research literature is clear about the importance of the teacher-child interaction when it comes to child outcomes. Professional development runs the gamut from pre-service (University based programs) to in-service (training, technical assistance, mentoring, coaching) programming for teachers and directors.

So where does this leave us when policy makers begin to try to determine which quality improvement initiatives should be invested in to start with, which to increase in funding, and maybe even which ones should be defunded. I think there are some trends we need to begin to look at, such as the following:

1) Having stringent and rigorous standards is very important. The more that we do not, the more opportunities for mediocre programs to score artificially higher on whatever scale that is used. This is evident with licensing data where the data are significantly skewed with a major plateau effect at the upper end of compliance rules/regulations.

2) Emphasis on teacher-child interaction needs to be paramount in our quality improvement initiatives. Working with teachers through mentoring/coaching appears to be most effective in changing teachers' behaviors in interacting more positively with children.

3) Making sure we are measuring the right outcomes. Match health and safety standards with health and safety outcomes for children. Match developmental outcomes for children with standards that emphasize positive teacher-child interactions.

4) Building upon #1 above, find what the key indicators are with all the data that we collect. We are spending too much time in looking at too many things which in many cases are simply just not the right things to look at. As states' data systems become more sophisticated, and they are, this will be easier to do. Let's begin to utilize the data we have already collected.

## An Opinion on Rules/Regulations, Standards, and Guidelines in Early Care and Education

**Richard Fiene, Ph.D.**

**August 2014**

Over the past two years there has been a great deal of activity and interest in the Early Care and Education (ECE) field related to rules/regulations, standards and guidelines. This interest comes at an opportune time as the ECE field develops a balance between licensing (program compliance), program quality improvement via QRIS (Quality Rating and Improvement Systems) & Pre-K programs, and structural and process quality.

Several publications have been put forth that represent these various activities which I would like to delineate and show how these various approaches fit together into a unified whole. The third edition of *Caring for Our Children* is the comprehensive set of standards/guidelines related to health and safety in the child care field. Its companion document called *Stepping Stones* is a risk assessment publication which focuses on those standards/guidelines that place children at greatest risk of mortality/morbidity. *Thirteen Indicators of Quality Child Care: Research Update* are the key indicators based upon *Stepping Stones* and *Caring for Our Children*. A relatively new approach *Caring for Our Children: Basics* is a combination of *Stepping Stones* and *Thirteen Indicators of Quality Child Care*.

I would like to propose the following model in how the above rules/regulations, standards and guidelines relate to each other and how one builds upon the other:

*13 Key Indicators*.

*Caring for Our Children: Basics* as the risk assessment/key indicator tool. *55 Standards*.

*Stepping Stones* as the risk assessment tool based upon morbidity/mortality. *138 Standards*.

*Caring for Our Children* standards/guidelines as the comprehensive set of health and safety standards/guidelines for the early care and education field. *650 Standards*.

This is a particularly exciting time in which we have several different tools that can be used to help improve early care and education programs via the above model for health and safety and then utilizing QRIS and Pre-K programs standards to build upon this solid licensing foundation.

# An Opinion on Balancing Structural and Process Quality Indicators in Early Care and Education

I have been following a very interesting discussion in the early care and education field about quality indicators and their impact on young children. As QRIS (Quality Rating & Improvement Systems) systems have been providing the impetus for this discussion, I think it is time to readdress how process and structural quality indicators both benefit a child's development, albeit in different domains. Hopefully this discussion will be one of inclusion rather than exclusion in which we do not place greater emphasis on process quality indicators at the expense of structural quality indicators which appears to be at the heart of this most recent discussion.

In the research literature, the focus of structural quality indicators are generally in the health and safety domain and are more regulatable, such as staff-child ratio, group size, supervision, child immunizations up to date, proper staff hand washing, etc; while the focus of process quality indicators have been interactions amongst children and staff which do not lend themselves to being regulatable easily.

As a developmental research psychologist I have been delighted with the increased focus on the process quality indicators and agree that we need to spend more time focusing our efforts on identifying the key indicators that make a difference in a child's developmental life in early care and education. However, after 40 years of public policy research, I am not willing to throw the structural quality indicators "under the bus". It is important to advocate for those process quality indicators that have an impact on a child's language, social-emotional, motor, and cognitive development but we cannot leave out the child's physical well-being and healthy development. My concern as I listen to my fellow researchers, policy makers, and legislative staff as I crisscross the country is that everyone is talking a lot about the process quality indicators with little regard to the continued importance of the structural quality indicators.

I have lectured on this topic more than I would like to admit over the past 5 years. I was hoping by now that the "either-or" discussion would have given way to an "and" discussion which accepts and embraces the contributions of both structural and process quality indicators to a child's development. As of this writing, I haven't seen a change and in fact I think the discussions are becoming more divisive rather than inclusionary. So for that reason I am putting on paper my above opinion about this discussion and the need for additional research to build more effective and efficient early care and education regulatory systems that have a balance between structural and process quality indicators.

## An Opinion on Balancing Program Compliance (Licensing) with Program Quality Systems (Pre-K and QRIS) in Early Care and Education

In conducting several very recent studies where comparisons were made between program compliance as measured by state child care licensing systems and program quality as measured through Pre-K and QRIS (Quality Rating and Improvement Systems) some very interesting statistically significant trends in the data were observed.

I have published results in the past describing a curvilinear relationship between licensing compliance with program quality measures (Environmental Rating Scales (ERS) or the CLASS). With the advent of Pre-K and QRIS programs being introduced within states, we now have sufficient data to begin to analyze the impact that these quality improvement programs have on state early care and education programs building upon state licensing systems.

The results are very promising from the few states that I have worked with. From the data analyzed to date, both Pre-K and QRIS programs are having a very positive impact on the overall quality of ECE programs where the programs that either are in Pre-K or at the highest Quality level within the QRIS are also the programs scoring the highest on the respective quality assessments, the ERS or CLASS tools. Now this may not seem all that earthshattering but I have consistently found that this was not the case when I compared licensing compliance data with the ERS and CLASS data. The programs that were in full compliance with all the licensing rules were not necessarily the programs that scored the highest on the ERS or CLASS tools. In other words, there was a curvilinear relationship between the licensing data and the quality data.

From a public policy standpoint, this is a very important distinction because the licensing rules do help to protect children from harm in the health & safety arenas but do not necessarily mean the program is of the highest quality. It would appear from the most recent data that the way to get to this public policy result is through the introduction of either a Pre-K program or a QRIS program.

There is still work to be done to determine the exact indicators of Pre-K and QRIS programs that statistically predict child development outcomes but this requires additional research.

For those interested in continuing this discussion, please contact me at the following website: http://DrFiene.wordpress.com/home or go to http://RIKInstitute.wikispaces.com/home for additional information about quality ECE key indicator research. I can also be reached at DrFiene@gmail.com

# Technical Detail Updates to the Fiene Key Indicator Methodology

## January 2015

The Key Indicator Methodology has recently been highlighted in a very significant Federal Office of Child Care publication series on Contemporary Licensing Highlights. In that Brief the Key Indicator Methodology is described as part of a differential monitoring approach along with the risk assessment methodology. Because of the potential increased interest in the Key Indicator Methodology, a brief update regarding the technical details of the methodology is warranted. For those readers who are interested in the historical development of Key Indicators I would suggest they download the resources available at the end of the paper.

This brief paper provides the technical and statistical updates for the key indicator methodology based upon the latest research in the field related to licensing and quality rating & improvement systems (QRIS). The examples will be drawn from the licensing research but all the reader needs to do is substitute "rule" for "standard" and the methodology holds for QRIS.

Before proceeding with the technical updates, let me review the purpose and conceptual underpinning of the Key Indicator Methodology. Key Indicators generated from the methodology are not the rules that have the highest levels of non-compliance nor are they the rules that place children most at risk of mortality or morbidity. Key Indicators are generally somewhere in the middle of the pack when it comes to non-compliance and risk assessment. The other important conceptual difference between Key Indicators and risk assessment is that only Key Indicators statistically predict or are predictor rules of overall compliance with all the rules for a particular service type. Risk assessment rules do not predict anything other than a group of experts has rated these rules as high risk for children's mortality/morbidity if not complied with.

Something that both Key Indicators and risk assessment have in common is through their use one will save time in their monitoring reviews because you will be looking at substantially fewer rules. But it is only with Key Indicators that you can statistically predict additional compliance or non-compliance; this is not the case with risk assessment in which one is only looking at those rules which are a state's high risk rules. And this is where differential monitoring comes into play by determining which programs are entitled to either Key Indicators and/or risk assessment for more abbreviated monitoring reviews rather than full licensing reviews (the interested reader should see the *Contemporary Licensing Series on Differential Monitoring, Risk Assessment and Key Indicators* published by the Office of Child Care.

**Technical and Statistical Framework**

One of the first steps in the Key Indicator Methodology is to sort the licensing data into high and low groups, generally the highest and lowest licensing compliance with all the rules can be used for this sorting. Frequency data will be obtained on those programs in the top level (usually top 20-25%) and the bottom level (usually the bottom 20-25%). The middle levels are not used for the purposes of these analyses. These two groups (top level & the bottom level) are then compared to how each program scored on each child care rule (see Figure 1). In some cases, especially where there is very high compliance with the rules and the data are extremely skewed, it may be necessary to use all those programs that are in full (100%) compliance with all the rules as the high group. The next step is to look at each rule and determine if it is in compliance or out of compliance with the rule. This result is cross-referenced with the High Group and the Low Group as depicted in Figure 1.

| **Figure 1** | ***Providers In Compliance on Rule*** | ***Programs Out Of Compliance on Rule*** | ***Row Total*** |
|---|---|---|---|
| ***Highest level (top 20-25%)*** | ***A*** | ***B*** | ***Y*** |
| ***Lowest level (bottom 20-25%)*** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | ***Grand Total*** |

Once the data are sorted in the above matrix, the following formula (Figure 2) is used to determine if the rule is a key indicator or not by calculating its respective Key Indicator coefficient. Please refer back to Figure 1 for the actual placement within the cells. The legend (Figure 3) below the formula shows how the cells are defined.

**Figure 2 – Formula for Fiene Key Indicator Coefficient**

$$\phi = (A)(D) - (B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

**Figure 3 – Legend for the Cells within the Fiene Key Indicator Coefficient**

***A = High Group + Programs in Compliance on Specific Rule.***
***B = High Group + Programs out of Compliance on Specific Rule.***
***C = Low Group + Programs in Compliance on Specific Rule.***
***D = Low Group + Programs out of Compliance on Specific Rule.***

***W = Total Number of Programs in Compliance on Specific Rule.***
***X = Total Number of Programs out of Compliance on Specific Rule.***
***Y = Total Number of Programs in High Group.***
***Z = Total Number of Programs in Low Group.***

Once the data are run through the formula in Figure 2, the following chart (Figure 4) can be used to make the final determination of including or not including the rule as a key indicator. Based upon the chart in Figure 4, it is best to have a Key Indicator Coefficient approaching +1.00 however that is rarely attained with licensing data but has occurred in more normally distributed data.

Continuing with the chart in Figure 4, if the Key Indicator Coefficient is between +.25 and -.25, this indicates that the indicator rule is unpredictable in being able to predict overall compliance with the full set of rules. Either a false positive in which the indicator appears too often in the low group as being in compliance, or a false negative in which the indicator appears too often in the high group as being out of compliance. This can occur with Key Indicator Coefficients above +.25 but it becomes unlikely as we approach +1.00 although there is always the possibility that other rules could be found out of compliance. Another solution is to increase the number of key indicator rules to be reviewed but this will cut down on the efficiency which is desirable and the purpose of the key indicators.

The last possible outcome with the Key Indicator Coefficient is if it is between -.26 and -1.00, this indicates that the indicator is a terrible predictor because it is doing just the opposite of the decision we want to make. The indicator rule would predominantly be in compliance with the low group rather than the high group so it would be statistically predicting overall non-compliance. This is obviously something we do not want to occur.

Figure 5 gives the results and decisions for a QRIS system. The thresholds in a QRIS system are increased dramatically because QRIS standard data are less skewed than licensing data and a more stringent criterion needs to be applied in order to include particular standards as Key Indicators.

**Figure 4 – Thresholds for the Fiene Key Indicators for Licensing Rules**

| Key Indicator Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.26) | Good Predictor | Include |
| (+.25) – (-.25) | Unpredictable | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

**Figure 5 – Thresholds for the Fiene Key Indicators for QRIS Standards**

| Key Indicator Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.76) | Good Predictor | Include |
| (+.75) – (-.25) | Unpredictable | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

**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):

Lahti, Elicker, Zellman, & Fiene (2014). Approaches to validating child care quality rating and improvement systems (QRIS): Results from two states with similar QRIS type designs, *Early Childhood Research Quarterly*, available online 9 June 2014, doi:10.1016/j.ecresq.2014.04.005.

Fiene (2013***)***. A Comparison of International Child Care and US Child Care Using the Child Care Aware – NACCRRA (National Association of Child Care Resource and Referral Agencies) Child Care Benchmarks, *International Journal of Child Care and Education Policy, 7(1)*, 1-15.

Zellman & Fiene (2012). *Validation of quality rating and improvement systems for early care and education and school-age care*, Washington, D.C.: OPRE and Child Trends.

Fiene & Carl (2011). Child Care Quality Indicators Scale, in T Halle (Ed.), *Quality Rating and Improvement Systems Tool Kit*, Washington, D.C.: Child Trends.

Fiene (2007). Child Development Program Evaluation & Caregiver Observation Scale, in T Halle (Ed.), *Early Care and Education Quality Measures Compendium*, Washington, D.C.: Child Trends.

Fiene (2003). Licensing related indicators of quality child care, *Child Care Bulletin*, Winter 2002-2003, 12-13.

Fiene (2002). *Thirteen indicators of quality child care: Research update*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services.

Fiene, & Kroh (2000). Measurement tools and systems, in *Licensing Curriculum*, National Association for Regulatory Administration, Minneapolis, Minnesota.

Fiene (1997). Potential solution to the child day care trilemma related to quality, accessibility and affordability. *Child Care Information Exchange*, September, 57-60.

Fiene (1997). Human services licensing information system. *National Association for Regulatory Administration: Research Column*, Spring, 9-10.

Fiene (1996). Using a statistical-indicator methodology for accreditation, in *NAEYC Accreditation: A Decade of Learning and the Years Ahead*, S. Bredekamp & B. Willer, editors, Washington, D.C.: National Association for the Education of Young Children.

Kuhns & Fiene (1995). Promoting health and safety in child care programs, *Child Care Bulletin*, January-February (1), 3.

Fiene (1995). *National early childhood program accreditation standards*. Atlanta, Georgia: National Early Childhood Program Accreditation Commission.

Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators*. Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.

Fiene (1994). The case for national early care and education standards: Key indicator/predictor state child care regulations, *National Association of Regulatory Administration*, summer 1994, 6-8.

Fiene (1991). New early childhood research, evaluation and training program has impact on Pennsylvania for the 1990's, *Dimensions*, Fall, 4.

Fiene (1988). Human services instrument based program monitoring and indicator systems, in *Information Technology and the Human Services*, B. Glastonburg, W. LaMendola, & S. Toole, editors, Chichester, England: John Wiley and Sons.

Fiene & McDonald (1987). *Instrument based program monitoring for child welfare*, Portland, Maine: University of Southern Maine.

Fiene (1987). Using licensing data in human service programs, in *Licensing*, H. Hornby, editor, Portland, Maine: University of Southern Maine.

Fiene (1987). The indicator system, in *Evaluation and outcome monitoring*, H. Hornby, editor, Portland, Maine: University of Southern Maine.

Kontos & Fiene (1987). Child care quality, compliance with regulations, and children's development: The Pennsylvania Study, in *Quality in Child Care: What Does Research Tell Us?*, Phillips, editor, Washington, D.C.: National Association for the Education of Young Children.

Fiene (1987). Indicator checklist system, in *Maximizing the Use of Existing Data Systems*, Portland, Maine: University of Southern Maine.

Fiene (1986). State child care regulatory, monitoring and evaluation systems as a means for ensuring quality child development programs, in *Licensing of Children's Services Programs*, Richmond, Virginia: Virginia Commonwealth University School of Social Work. (ERIC/ECE ED322997)

Morgan, Stevenson, Fiene, & Stephens (1986). Gaps and excesses in the regulation of child day care, *Reviews of Infectious Diseases--Infectious Diseases in Child Day Care: Management and Prevention*, *8*(4), 634-643.

Kontos & Fiene (1986). Predictors of quality and children's development in day care, in *Licensing of Children's Services Programs*, Richmond, Virginia: Virginia Commonwealth University School of Social Work.

Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly*, *14*(3), 198-214.

Fiene (1985). Measuring the effectiveness of regulations, *New England Journal of Human Services*, *5*(2), 38-39.

Fiene & Nixon (1983). *Indicator checklist system for day care monitoring*, Washington, D.C.: National Children's Services Monitoring Consortium.

Fiene & Nixon (1981). *An instrument based program monitoring information system: A new tool for day care monitoring*, Washington, D.C.: National Children's Services Monitoring Consortium.

Fiene (1981). A new tool for day care monitoring introduced by children's consortium, *Evaluation Practice*, *1*(2), 10-11.

Fiene, Cardiff, & Littles (1975). Ecological monitoring information system, *In the Best Interests of Children*, July-September, 1975.

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**Conclusion**

Hopefully this research monograph has provided the reader with enough information to further explore the potential of the ECPQIM/DMLMA model. The ECPQIM/DMLMA has evolved over the past 40 years through 4 editions with the latest edition having been validated in various jurisdictions (please see the citation and reference listing as well as the specific section within this monograph.

The continuation of the differential monitoring, risk assessment and key indicator methodologies will be undertaken by the National Association for Regulatory Administration (NARA) in moving forward from 2016. For those who are interested in these methodologies, please see their website for further details and information (http://www.naralicensing.org).

**PUBLICATIONS (Early Childhood Program Quality Indicators Model (ECPQIM))**

**Conceptual:**

Fiene, (2015). *Early childhood program quality indicators model (Version 4): Differential monitoring, risk assessment and key indicators*, Middletown, PA.: Research Institute for Key Indicators.

Manlove, Benson, Strickland, & Fiene (2011). *A comparison of regulated child care in rural and urban Pennsylvania*, Pennsylvania: Center for Rural Pennsylvania.

Fiene, & Kroh (2000). Measurement tools and systems, in *Licensing Curriculum*, National Association for Regulatory Administration, Minneapolis, Minnesota.

Fiene (1997). Potential solution to the child day care trilemma related to quality, accessibility and affordability. *Child Care Information Exchange,* September, 57-60.

Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators*. Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.

Fiene (1991). New early childhood research, evaluation and training program has impact on Pennsylvania for the 1990's, *Dimensions*, Fall, 4.

Kontos & Fiene (1987). Child care quality, compliance with regulations, and children's development: The Pennsylvania Study, in *Quality in Child Care: What Does Research Tell Us?*, Phillips, editor, Washington, D.C.: National Association for the Education of Young Children.

Morgan, Stevenson, Fiene, & Stephens (1986). Gaps and excesses in the regulation of child day care, *Reviews of Infectious Diseases--Infectious Diseases in Child Day Care: Management and Prevention, 8*(4), 634-643.

Kontos & Fiene (1986). Predictors of quality and children's development in day care, in *Licensing of Children's Services Programs*, Richmond, Virginia: Virginia Commonwealth University School of Social Work.

Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly, 14*(3), 198-214.

Fiene (1985). Measuring the effectiveness of regulations, *New England Journal of Human Services, 5*(2), 38-39.

Fiene, Cardiff, & Littles (1975). Ecological monitoring information system, *In the Best Interests of Children*, July-September, 1975.

Fiene (1979). Potpourri of child development, *In the Best Interests of Children*, Spring, 14-15.

Fiene (1975). Current trends in child day care research, *In the Best Interests of Children*, Spring, 15-18.

Fiene (1974). The two year old: Characteristics and management of his play, *Dimensions: Journal of the Southern Association of Children Under Six, January, 1974, 2*(2), 46-48.

**QRIS and Quality Initiatives:**

Lahti, Elicker, Zellman, & Fiene (2014). Approaches to validating child care quality rating and improvement systems (QRIS): Results from two states with similar QRIS type designs, *Early Childhood Research Quarterly*, available online 9 June 2014, doi:10.1016/j.ecresq.2014.04.005.

Zellman & Fiene (2012). *Validation of quality rating and improvement systems for early care and education and school-age care*, Washington, D.C.: OPRE and Child Trends.

Fiene and Isler (2007). Home based and family child care: Characteristics and quality issues, In C. J. Groark, K. E., Mehaffie, R. B. McCall & M. T. Greenberg (Eds.), *Evidence-Based Programs, Practices, and Policies for Early Childhood Care and Education.* Thousand Oaks, CA:Corwin Press.

Weinraub, Shlay, Kochanoff & the Universities Children's Policy Collaborative (Fiene, Greenberg, McCall, Groark, Mehaffie, Nelkin & Ethridge-Smith) (2006). Findings from the 2002 Pennsylvania Family Survey and their relevance for the future, *Commonwealth*, Pennsylvania House of Representatives (LORL).

Fiene (2006). Early Childhood Initiatives in Other States, in J.M. Perzel, *Education in Pennsylvania: Early Childhood Education: Universal Pre-K and Other Alternatives*, Volume 4, Spring, 2006, Harrisburg: Pennsylvania House of Representatives.

Fiene, Greenberg, Bergsten, Carl, Fegley, & Gibbons (2002). *The Pennsylvania early childhood quality settings study*, Harrisburg, Pennsylvania: Governor's Task Force on Early Care and Education.

Fiene (1995). *National early childhood program accreditation standards*. Atlanta, Georgia: National Early Childhood Program Accreditation Commission.

**Licensing Measurement:**

Fiene (2013***).*** A Comparison of International Child Care and US Child Care Using the Child Care Aware – NACCRRA (National Association of Child Care Resource and Referral Agencies) Child Care Benchmarks, *International Journal of Child Care and Education Policy, 7(1),* 1-15.

Fiene & Carl (2011). Child Care Quality Indicators Scale, in T Halle (Ed.), *Quality Rating and Improvement Systems Tool Kit*, Washington, D.C.: Child Trends.

Fiene (2007). Child Development Program Evaluation & Caregiver Observation Scale, in T Halle (Ed.), *Early Care and Education Quality Measures Compendium*, Washington, D.C.: Child Trends.

Fiene (2003). Licensing related indicators of quality child care, *Child Care Bulletin*, Winter 2002-2003, 12-13.

Fiene (2002). *Thirteen indicators of quality child care: Research update*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services.

Fiene (1997). Human services licensing information system. *National Association for Regulatory Administration: Research Column*, Spring, 9-10.

Fiene (1996). Unannounced versus announced licensing visits in monitoring child day care programs. *National Association of Regulatory Administration*, Spring, 5-6.

Fiene (1996). The feasibility of using sampling of agency facilities. *National Association for Regulatory Administration Licensing Newsletter*, fall, 12-14.

Fiene (1996). Using a statistical-indicator methodology for accreditation, in *NAEYC Accreditation: A Decade of Learning and the Years Ahead*, S. Bredekamp & B. Willer, editors, Washington, D.C.: National Association for the Education of Young Children.

Fiene (1995). Improving human services through licensing reform and training: A unique partnership between academia and state government, *Dimensions*, Fall, 1-3.

Kuhns & Fiene (1995). Promoting health and safety in child care programs, *Child Care Bulletin*, January-February (1), 3.

Fiene (1994). The case for national early care and education standards: Key indicator/predictor state child care regulations, *National Association of Regulatory Administration*, summer 1994, 6-8.

Fiene (1988). Human services instrument based program monitoring and indicator systems, in *Information Technology and the Human Services*, B. Glastonburg, W. LaMendola, & S. Toole, editors, Chichester, England: John Wiley and Sons.

Fiene & McDonald (1987). *Instrument based program monitoring for child welfare*, Portland, Maine: University of Southern Maine.

Fiene (1987). Using licensing data in human service programs, in *Licensing*, H. Hornby, editor, Portland, Maine: University of Southern Maine.

Fiene (1987). The indicator system, in *Evaluation and outcome monitoring*, H. Hornby, editor, Portland, Maine: University of Southern Maine.

Fiene (1987). Indicator checklist system, in *Maximizing the Use of Existing Data Systems*, Portland, Maine: University of Southern Maine.

Fiene (1986). State child care regulatory, monitoring and evaluation systems as a means for ensuring quality child development programs, in *Licensing of Children's Services Programs*, Richmond, Virginia: Virginia Commonwealth University School of Social Work. (ERIC/ECE ED322997)

Fiene & Nixon (1983). *Indicator checklist system for day care monitoring*, Washington, D.C.: National Children's Services Monitoring Consortium.

Fiene & Nixon (1981). *An instrument based program monitoring information system: A new tool for day care monitoring*, Washington, D.C.: National Children's Services Monitoring Consortium.

Fiene (1981). A new tool for day care monitoring introduced by children's consortium, *Evaluation Practice, 1*(2), 10-11.

Fiene (1978). Theoretical model for computing adult child ratios, *Association of Regulatory Administration*, summer, 12-13.

**Professional Development:**

Johnson, Fiene, McKinnon, & Babu (2010). *A study of early childhood education pre-service teacher education at major universities in 38 pre-k states*. New York, New York: Foundation for Child Development.

Fiene (2009). Mentoring programs help caregivers "weigh" in on children's eating behaviors, *Penn State Policy Briefing*, University Park, Pennsylvania: Center for Public Policy Research in Environment, Energy and Community.

Fiene (2008). Using Child Care Programs As A Portal to Changing the Eating Behaviors of Young Children, in L. Birch and W. Dietz (Eds.), *Eating Behaviors of the Young Child: Prenatal and Postnatal Influences on Healthy Eating*, Elk Grove Village, Illinois: American Academy of Pediatrics.

Fiene (2002). Improving child care quality through an infant caregiver mentoring project, *Child and Youth Care Forum, 31*(2), 75-83.

Johnson, Fiene, Keat, Darling, Pratt, Iutcovich (2001). Mastering course content and learner satisfaction: A comparison of regular classroom instruction with three variations of internet delivery. *Journal of Early Childhood Teacher Education, 22(4),* 267-274.

Iutcovich, Fiene, Johnson, Koppel, & Langan (2001). Professional development and the quality of child care: An assessment of Pennsylvania's child care training system. In *Early education and care, and reconceptualizing play*, Elsevier Science Ltd., Volume 11, 115-168.

Fiene, Iutcovich, Johnson, & Koppel (1998). Child day care quality linked to opportunities for professional development: An applied community psychology example. *Community Psychologist, 31*(1), 10-11.

Fiene, (1997). Quality child care in Pennsylvania linked to opportunities for professional development. *National Association of Regulatory Administration*, Autumn 1997, page 13.

Iutcovich, Fiene, Johnson, Koppel, & Langan (1997). *Investing in our children's future*, Erie, Pennsylvania: Keystone University Research Corporation.

Fiene (1995). Utilizing a statewide training system to improve child day care quality: The other system in a program quality improvement model. *Child Welfare*, Volume LXXIV, #6, November-December, 1189-1201.

## Georgia Child Care Licensing Study: Validating the Core Rule Differential Monitoring System

# Executive Summary

**Richard Fiene, Ph.D.**

The purpose of this study was to validate Georgia's process for determining if a state-regulated child care facility is compliant with basic state health and safety requirements. The process was developed by staff at Bright from the Start: Georgia Department of Early Care and Learning (DECAL). Currently Georgia utilizes a "Core Rule" risk assessment approach in which the health and safety rules deemed most crucial to ensure children's health and safety are used to compute a program's compliance status.

This validation study utilized a unique analytical model that compared licensing data with previous key indicator (*for readers not familiar with this term, please see the definitions on page 4 of the report*) research and ascertained if the Core Rules accurately indicated a program's overall compliance with the total population of licensing rules.

Additional statistical analyses examined if the mathematical formula used to compute compliance was an appropriate configuration of the data that discerned between those programs that adequately met basic health and safety rules (compliant) and those that did not (non-compliant). Also licensing data were compared to a representative sample of quality data collected as part of a different study to examine the correlation between compliance and quality. A Differential Monitoring Logic Model/Algorithm (*DMLMA*©) (Fiene, 2012) and a previous validation model (Zellman & Fiene, 2012) were used in the research.

One hundred and four child care centers (104 CCC) and 147 family child care (FCC) homes were assessed. Licensing data over a four-year period (2008-2012) and matching program quality data from a two-year period (2007-2008) were used in this study.

The study focused on three research questions:

1. Do the Core Rules CCCs and FCC homes serve as overall Key Indicators of compliance?
2. Does the Annual Compliance Determination Worksheet (ACDW) appropriately designate programs as compliant or non-compliant related to health and safety?
3. Are the Core Rules related to program quality?

The analysis demonstrated that the Core Rules did serve as key indicators, and these key indicators were identified for both center based and home based child care. The second analysis concluded that the ACDW computation did distinguish between compliant and non-compliant programs. Finally, the expected correlation between compliance and quality was found but only for state-funded Pre-K classrooms, not for family child care nor for preschool classrooms that were not part of the state-funded Pre-K.

# Georgia Child Care Licensing Study: Validating the Core Rule Differential Monitoring System

**Richard Fiene, Ph.D.**

**February 1, 2014**

**This study was made possible by a grant from Bright from the Start: Georgia Department of Early Care and Learning. All opinions expressed in the report reflect the opinions of the author, not necessarily those of the Department of Early Care and Learning.**

## ABSTRACT

The purpose of this study was to validate Georgia's process for determining if a state-regulated child care facility is compliant with basic state health and safety requirements. The process was developed by staff at Bright from the Start: Georgia Department of Early Care and Learning (DECAL). Currently Georgia utilizes a "Core Rule" risk assessment approach in which the health and safety rules deemed most crucial to ensure children's health and safety are used to compute a program's compliance status. This validation study utilized a unique analytical model that compared licensing data with previous key indicator (*for readers not familiar with this term, please see the definitions on page 4 of the report*) research and ascertained if the Core Rules accurately indicated a program's overall compliance with the total population of licensing rules. Additional statistical analyses examined if the mathematical formula used to compute compliance was an appropriate configuration of the data that discerned between those programs that adequately met basic health and safety rules (compliant) and those that did not (non-compliant). Also licensing data were compared to a representative sample of quality data collected as part of a different study to examine the correlation between compliance and quality. A Differential Monitoring Logic Model/Algorithm (*DMLMA*©) (Fiene, 2012) and a previous validation model (Zellman & Fiene, 2012) were used in the research. Child care centers (CCC) and family child care (FCC) homes were assessed. The analysis demonstrated that the Core Rules did serve as key indicators, though this list should be reexamined. The second analysis concluded that the computation could be simplified. Finally, the expected correlation between compliance and quality was found but only in state-funded Pre-K classrooms; it was not found in preschool classrooms and could not be validated. Family child care could not be validated either. As a result of the study, recommendations were made to strengthen Georgia's system.

## Acknowledgements:

Special thanks are extended to DECAL staff who had the vision to conduct this validation study: Bobby Cagle, Commissioner; Kay Hellwig, Assistant Commissioner for Child Care Services; Kristie Lewis, Director of Child Care Services; and Dr. Bentley Ponder, Director of Research & Evaluation. Also, researchers at the University of North Carolina, Chapel Hill, Frank Porter Graham Child Development Institute , Dr. Donna Bryant and Dr. Kelly Maxwell who made this study so much more significant by sharing program quality data from earlier studies they completed in Georgia.

## INTRODUCTION

### Background of Georgia's Compliance Determination System

Similar to other states, Georgia has a licensing and monitoring system that oversees a diverse population of early care and learning programs across the state. The licensing and monitoring system of early care and learning programs is charged to Bright from the Start: Georgia Department of Early Care and Learning (DECAL), a state early education department that also oversees and administers Georgia's Pre-K Program, Child Care and Development Block Grant, the Child and Adult Care Food Program, and the Summer Food Service Program. In 2012, DECAL's licensing and monitoring system regulated approximately 6,300 early care and learning programs. The crux of this regulation is determining if the programs meet Georgia's health and safety rules. Programs that meet these rules are determined to be compliant.

In the mid 2000's, Georgia began experimenting with a process that determined whether or not a program was designated as compliant with the state's health and safety regulations by focusing on key Core Rules. These are health and safety rules deemed crucial to minimizing risk related to children's health and safety. Seventy-four rules out of the 456 that programs must follow were classified as Core Rules[1]. Core Rules are cited by severity (low, medium, high, extreme). It is important to note that this entails a risk assessment theoretical approach rather than a Key Indicator statistical approach. This means that the Core Rules were determined by content analysis rather than by a statistical procedure.

Though this system has undergone some slight revisions, this basic methodology is still in place:

1. All programs receive at least one full licensing study and one monitoring visit. At the licensing study all applicable rules are examined. At the monitoring visit, only Core Rules (or any rule that was not met at the licensing study) are examined.
2. If additional visits are conducted, the Core Rules are examined again at that time.
3. At the end of the fiscal year (June 30), each program receives a compliance determination. This determination is based on all visits (licensing study, monitoring visit, and other reviews). A standardized worksheet, Annual Compliance Determination Worksheet (ACDW), is used to make the computation that determines the designation.
4. The compliance status remains until the next determination one year later. Programs do not have an opportunity to contest the compliance determination, though programs have numerous opportunities to contest any citation.
5. At the conclusion of Fiscal Year 2012, approximately 91% of the programs were classified as compliant. A program's eligibility for certain services, acceptance into Quality Rated and Georgia's Pre-K Program, is impacted by the program's compliance determination.

### Background of this Study

Since the compliance determination system has been used for several years, key policymakers at DECAL requested an external review to validate if the system was operating as intended. Are the Core Rules a sufficient subsample to measure a program's overall regulation with the state's health and safety regulations? Furthermore, does the compliance determination formula appropriately differentiate compliant programs from non-compliant programs? In other words, is the computation a viable way to make this designation? And finally, does compliance determination serve as a sufficient indicator for other aspects of quality not addressed in Georgia's health and safety rules?

The purpose of this study was to validate the aforementioned compliance determination process. This validation process utilized a unique analytical model that compared licensing data with previous key indicator research and ascertained if the Core Rules are an indication of a program's overall compliance with the total population of licensing rules. Second, additional statistical analyses examined if the mathematical formula used to compute compliance was an appropriate configuration of the data that differentiated between those programs that adequately met basic health and safety rules (compliant) and those that did not (non-compliant). Finally, licensing data were

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[1] The number of Core Rules was expanded in 2012 to include increased enforcement and sanctions regarding transportation. The new Core Rules were not part of this analysis.

compared to a representative sample of quality data collected as part of a different study to examine the correlation between compliance and quality (see a further explanation of the sample in the Limitations Section of this report).

Specifically, the study addressed the following research questions:

1. **Do the Core Rules for child care centers (CCC) and family child care (FCC) homes serve as overall Key Indicators of compliance?**
2. **Does the Annual Compliance Determination Worksheet (ACDW) appropriately designate programs as compliant or non-compliant related to health and safety?**
3. **Are the Core Rules related to program quality?**

The following definitions are used in the study:

***Core Rules*** = the rules determined to be of greatest importance and place children at greatest risk if not complied with. This approach is defined in the licensing literature as a risk assessment approach. Core Rules cover 12 regulatory areas and 74 specific rules. The Core Rules were the focal point of this validation study and are addressed in the first approach to validation – Standards and the first research question.

***ACDW*** = Annual Compliance Determination Worksheet, the compliance decision-making system based on the Core Rules that can be used to determine the number of visits made to programs. The ACDW was the secondary focal point of this validation study and is addressed in the second approach to validation – Measures and the second research question.

***Key Indicators*** = a differential monitoring approach that uses only those rules that statistically predict overall compliance with all the rules. In other words, if a program is 100% in compliance with the Key Indicators, the program will also be in substantial to full compliance with all rules. The reverse is also true in that if a program is not 100% in compliance with the Key Indicators, the program will also have other areas of non-compliance with all the rules. In this study, eight Key Indicators rules were identified for CCC and nine Key Indicators rules for FCC (See pages 15-16 for the specific indicators and additional detail about the methodology). These are in addition to the Core Rules.

***Rule Violations or Citations*** = occurs when a program does not meet a specific rule and is cited as being out of compliance with that rule. These individual rule violations/citations are summed to come up with total violation/citation scores on the Core Rules and on the Licensing Studies.

***Differential Monitoring*** = a relatively new approach to determining the number of licensing visits made to programs and to what rules are reviewed during these visits. Two measurement tools drive differential monitoring: one is a Weighted Risk Assessment, and the other is a Key Indicator checklist. Weighted Risk Assessments determine how often a program will be visited while Key Indicator checklists determine what rules will be reviewed in the program. Differential monitoring is a powerful approach when Risk Assessment is combined with Key Indicators because a program is reviewed by the most critical rules and the most predictive rules. See Figure 1 which presents a Logic Model & Algorithm for Differential Monitoring *(DMLMA©) (*Fiene, 2012).

***Licensing Study*** = a comprehensive review of a program where all child care rules are reviewed.

***Monitoring Visit*** = an abbreviated form of a visit and review in which only a select group (Core Rules) of child care rules are reviewed.

***Program Quality =*** for the purposes of this study, quality was measured in child care centers by the *Early Childhood Environment Rating Scale-Revised (ECERS-R), Infant Toddler Environment Rating Scale-Revised (ITERS-R*) and in family child care homes by the *Family Child Care Environment Rating Scale-Revised (FCCERS-R*). The program quality measures were used as part of the third approach to validation – Outputs and the third research question.

**Scoring for Licensing Variables/Data Collection Protocols:**

***Licensing Study*** = the total number of rule violations for a specific facility.

***Core Rules*** = the total number of core rule violations.

***ACDW/Compliance Designation*** = the annual compliance determination taken from the Annual Compliance Determination Worksheet. Compliant [C] was coded as "1" in the data base; Non-Compliant [NC] was coded as "0" in the data base.

***Key Indicators*** = these were generated by a statistical methodology based upon the ability of the specific rule to predict full compliance with all the rules. Data from the Licensing Studies were used to make this determination of key indicator rule status.

## METHODOLOGY AND ANALYTICAL FRAMEWORK

Licensing data over a four-year period (2008-2012) and matching program quality data from a two-year period (2007-2008) were used in this study. Specifically, data from 104 child care centers and 147 family child care homes were analyzed. Data from licensing studies (all rules) and monitoring visits (selected rules) were utilized. Program quality data were provided by researchers from the FPG Child Development Institute at the University of North Carolina at Chapel Hill (FPG), and the FPG research team matched these data points with the licensing data provided by DECAL (See the following website for the specific reports - ***http://decal.ga.gov/BftS/ResearchStudyOfQuality.aspx)***. All the data were analyzed by the Research Institute for Key Indicators.

Two models were used to frame the analysis: a Validation Framework that uses four approaches (Zellman & Fiene, 2012) to validating quality rating and improvement systems (QRIS) being applied to licensing systems; and a *Differential Monitoring Logic Model and Algorithm (DMLMA©)(*Fiene, 2012) were employed to answer the three research questions for this Validation Study. The validation approaches are described below; the *DMLMA©* is described at the beginning of the Findings Section of this report.

***The first validation approach*** deals with examining the validity of key underlying concepts by assessing if basic components and standards are the right ones by examining levels of empirical and expert support. For this study, this approach used Key Indicators to validate the Core Rules since Risk Assessment and Key Indicators are differential monitoring approaches. This answers the first research question.

***The second validation approach*** deals with examining the measurement strategy and the psychometric properties of the measures used by assessing whether the verification process for each rule is yielding accurate results. Properties of the key rules can be measured through inter-rater reliability on observational measures, scoring of documentation, and inter-item correlations to determine if measures are psychometrically sound. Cut scores can be examined to determine the most appropriate ways to combine measures into summary ratings. For this study, the second validation approach validates the use of the ACDW and Core Rules by comparing compliance decisions with the Licensing Studies. This answers the second research question.

***The third validation approach*** deals with assessing the outputs of the licensing process by examining the variation and patterns of program level ratings within and across program types to ensure that the ratings are functioning as intended. The approach examines the relationship of program level ratings to other more broadly based program quality measures and examines alternate cut points and rules to determine how well the ratings distinguish different levels of quality. For this study, this approach used data from Core Rules and Licensing Studies and data from earlier program quality studies (Maxwell, et al., 2009a,b; 2010) for validation. This answers the third research question.

Out of the four validation approaches (See Table 8), only three were utilized in this study. ***The fourth validation approach*** deals with how ratings are associated with children's outcomes. This approach examines the relationship between program level ratings and selected child outcomes to determine whether higher program ratings are associated with better child outcomes. This approach did not have data that could be used in this study.

## FINDINGS

The *DMLMA©* (See Figure 1) provides the conceptual model for assessing the overall effectiveness of Georgia's approach using Core Rules. In the model, the two main tools are Risk Assessment and Key Indicator measurements, which are created from a statistical analysis of the comprehensive licensing tool. The comprehensive licensing tool measures compliance with all rules. For the purposes of this study the Licensing Study represents the comprehensive licensing tool while the Core Rules represent a Risk Assessment tool. For the Program Quality tools, the ECERS-R, ITERS-R and FCCERS-R were utilized from an earlier program quality study by FPG Child Development Institute at the University of North Carolina at Chapel Hill (Maxwell, et al., 2009a,b; 2010). Georgia currently does not use a Key Indicator tool (see Table 1). With the DMLMA© analytical methodology, specific correlational thresholds are expected (please refer to Figure 1 on page 14).

**TABLE 1**

| ***DMLMA*© Terminology** | **Georgia Examples and Data Sources** |
|---|---|
| Comprehensive Tool | Licensing Study |
| Program Quality Tool | ECERS-R and ITERS-R for CCC; FCCERS-R for FCC |
| Risk Assessment Tool | Core Rules |
| Key Indicators Tool | Not Present (Generated as part of this Study-see Tables 9/10) |
| Differential Monitoring Tool | ACDW Compliance Determination |

Before presenting the findings for the validation approaches, some basic descriptive statistics are provided regarding the major variables in this study: Licensing Study, ACDW, Core Rules, and Key Indicators (see Table 2). The data are provided for both child care centers and family child care homes. It is clear from these basic descriptive statistics that the data distributions are very skewed in a positive fashion which means that there is very high compliance with all the major licensing variables for this study. In other words, the majority of programs are in substantial compliance with all the licensing rules and receive a compliant determination.

**TABLE 2**

| **Licensing Variable** | **Mean** | **Range** | **SD** | **Skewness** | **Kurtosis** |
|---|---|---|---|---|---|
| Licensing Study (CCC) | 5.51 | 25 | 5.26 | 1.47 | 2.11 |
| ACDW (CCC) | 0.75 | 1 | 0.44 | -1.17 | -0.64 |
| Core Rules (CCC) | 4.47 | 22 | 4.72 | 1.81 | 3.60 |
| Key Indicators (CCC) | 1.68 | 6 | 1.61 | 0.90 | 0.073 |
| | | | | | |
| Licensing Study (FCC) | 5.85 | 33 | 5.71 | 1.56 | 3.37 |
| ACDW (FCC) | 0.87 | 1 | 0.34 | -2.23 | 3.03 |
| Core Rules (FCC) | 1.61 | 11 | 1.75 | 1.99 | 6.61 |
| Key Indicators (FCC) | 2.37 | 8 | 2.13 | 0.63 | -0.57 |

**Licensing Study Mean = the average number of total rule violations.**
**ACDW Mean = the average score for a determination of compliance (1) or non-compliance (0).**
**Core Rules Mean = the average number of core rule violations.**
**Key Indicators Mean = the average number of key indicator violations.**

The findings are presented by the three validation approaches of Standards, Measures, and Outputs as well as the three research questions related to Key Indicators, Core Rules, and Program Quality.

1) **Validation of Standards (First Approach to Validation) for answering the first research question: *Do the Core Rules for child care centers (CCC) and family child care (FCC) homes serve as overall key indicators of compliance?***

In this first approach to validation which focuses on Standards, Key Indicators were generated from the Licensing Studies because Core Rules (a Risk Assessment tool) and Key Indicators are both Differential Monitoring approaches (see Figure 1). The Core Rules were compared to the Key Indicators generated by the licensing data base and there was a .49 correlation for CCC (n = 104) and .57 correlation for FCC (n = 147) which indicates a relationship between the Core Rules and Key Indicators at a p < .0001 significance level (Table 3). Also, the Key Indicators were correlated with the Licensing Study data and significant results were determined with r values of .78 (p < .0001) for CCC (n =104) and .87 (p < .0001) for FCC (n = 147). These results clearly met the expected *DMLMA©* thresholds between the key indicator rules with core rules (.50+) and licensing studies (.70+).

**TABLE 3**

| Key Indicators with Core Rules and Licensing Study | r = | p < | n = |
|---|---|---|---|
| Key Indicators and Core Rules (CCC) | .49 | .0001 | 104 |
| Key Indicators and Licensing Study (CCC) | .78 | .0001 | 104 |
| Key Indicators and Core Rules (FCC) | .57 | .0001 | 147 |
| Key Indicators and Licensing Study (FCC) | .87 | .0001 | 147 |

Table 3 begins to demonstrate how the Georgia Child Care Licensing system is utilizing the ***DMLMA©*** terminology from Table 1. With the generation of Key Indicators from this study, all the key elements within a differential monitoring system are present. This crosswalk to the ***DMLMA©*** will continue in Tables 4 & 5.

2) **Validation of Measures (Second Approach to Validation) for answering the second research question*: Is the Annual Compliance Determination Worksheet (ACDW) a valid measure in determining the overall health and safety compliance of Georgia's early care and learning programs?***

The Core Rules and the ACDW were compared to the Licensing Study data and compliance designation to determine the validation of the ACDW scoring protocol. There was a high correlation between the number of violations on the Core Rules and the total licensing violations on the Licensing Studies (r = .69; p < .0001)(Table 4). This result helps to validate that the ACDW is actually discriminating between high compliant and low compliant providers for CCC. For FCC, there was also a high correlation between the number of violations on the Core Rules and the total licensing violations on the Licensing Studies (r = .74; p < .0001). These results meet the *DMLMA©* thresholds of .50+ for Licensing Studies and Core Rules.

When Core Rules were correlated with the ACDW compliance decisions, there was a significantly high correlation for CCC (r = .76; p < .0001) and for FCC (r = .70; p < .0001). The key element of the ACDW scoring protocol is that the Core Rules distinguish between high and low compliant providers. The CCC/Core Rules and ACDW have been validated, as well as the FCC/Core Rules and ACDW because both the correlations were above the expected *DMLMA©* threshold (.50+).

**TABLE 4**

| Core Rules with Licensing Studies and ACDW | r = | p < | n = |
|---|---|---|---|
| Core Rules and Licensing Studies (CCC) | .69 | .0001 | 104 |
| Core Rules and ACDW (CCC) | .76 | .0001 | 104 |
| Core Rules and Licensing Studies (FCC) | .74 | .0001 | 147 |
| Core Rules and ACDW (FCC) | .70 | .0001 | 147 |

3) **Validation of Outputs (Third Approach to Validation) for answering the third research question: *Are the Core Rules correlated with program quality?***

For this approach, programs were divided into those that had an ITERS-R score, an ECERS-R score for a preschool class, and an ECERS-R score for a Georgia's Pre-K class; and those that had only an ITERS-R score and an ECERS-R score for preschool. The sample was evenly divided. Since Georgia has placed substantial resources into its Pre-K program, it was thought that this analysis might suggest if there was anything different between programs with a Georgia's Pre-K class and those without.

When the Core Rules for CCC's were compared with program quality data (ECERS-R/PS + ITERS-R), a significant correlation was not found between CCC (r = .27) for programs with only preschool classrooms but was found for programs with Pre-K classrooms (ECERS-R/PK + ITERS-R) (r = .60). When Core Rules for FCC's were compared to the FCC program quality data (FCCERS-R), the correlations were at a much lower level (r = .17) (See Table 5). However, these results are constrained by the limited range of the data; see the Limitation Section that follows this section.

Upon closer inspection of the correlations in Table 5 for CCC, it would appear that the CCC compliance system is more valid with the state-funded Pre-K programs (.48) than with the preschool programs (.21) because the correlations between the various Environment Rating Scales (ECERS-R + ITERS-R) are significant only when compared to the respective compliance with all rules on the Licensing Studies in the programs that have Pre-K programs. In making these comparisons, programs that had both ECERS-R and ITERS-R were combined and compared to the respective Licensing Study data (these data were reversed scored in which the number of violations were subtracted from a perfect score of 100). The differences are even more significant when you compare the Environment Rating Scales and the Core Rules where the Pre-K programs' correlation between the compliance with Core Rules and Environment Rating Scales is .60 and preschool programs is .27 while the FCC is .17.

Program quality data refer to data collected in earlier studies by researchers from FPG (Maxwell, et al., 2009a,b; 2010) in which FPG collected Environment Rating Scales (ECERS-R; ITERS-R; FCCERS-R) data on a representative sample of CCC and FCC (See (h***ttp://decal.ga.gov/BftS/ResearchStudyOfQuality.aspx)*****.** In comparing the program compliance and program quality data, the analyses supported the validation of the CCC for Pre-K only programs (*DMLMA*© threshold = .30+) but it was weaker for the FCC programs and not significant for preschool programs and therefore could not be validated. See Table 13 on page 17 for a further explanation of the CCC data distribution.

**TABLE 5**

| **Program Compliance and Quality Comparisons** | **r =** | **p <** | **n=** |
|---|---|---|---|
| ECERS-R/PK + ITERS-R and Licensing Studies | .48 | .001 | 45 |
| ECERS-R/PK + ITERS-R and Core Rules | .60 | .0001 | 45 |
| ECERS-R/PS + ITERS-R and Licensing Studies | .21 | ns | 45 |
| ECERS-R/PS + ITERS-Rand Core Rules | .27 | ns | 45 |
| FCCERS-R and Licensing Studies | .19 | .04 | 146 |
| FCCERS-R and Core Rules | .17 | .03 | 146 |

**LIMITATION**

The sampling for this study was based on previous studies (Maxwell, 2009a,b; 2010) completed by FPG in which program quality data were collected and analyzed. This study employed a subset of sites that were a representative sample of Georgia's child care licensing system. Not all of these sites could be used for this study because some had closed or some did not have the necessary data to make comparisons. So the sample at this point is one of convenience; however, 104 of the 173 CCC and 146 of the 155 FCC were used in this study, a significant number of the original representative sample. Also, when the Environment Rating Scales (ECERS-R, ITERS-R, FCCERS-R) scores were compared with the CCC and FCC samples, there were no significant differences (average difference was .01-.03) between the two study samples (See Table 6).

**TABLE 6**

| **Environment Rating Scale Scores** | **FPG** | **This Study** |
|---|---|---|
| ECERS-R Pre-K Total Scale Scores | 4.16 | 4.15 |
| ECERS-R Preschool Total Scale Scores | 3.39 | 3.42 |
| ITERS-R Total Scale Scores | 2.74 | 2.72 |
| FCCERS-R Total Scale Scores | 2.50 | 2.49 |

**CONCLUSION**

The CCC differential monitoring through the Core Rules/ACDW has been validated on the three approaches (Standards, Measures, and Outputs (Pre-K Program only)) and three research questions (Key Indicators, Core Rules, Program Quality (Programs with Georgia Pre-K only)) (See Table 7). The FCC differential monitoring through the Core Rules/ACDW was validated on the first validation approach (Standards) and first research question (Key Indicators); validated on the second validation approach (Measures) and second research question (Core Rules); but not validated on the third validation approach (Outputs) and third research question (Program Quality).

**TABLE 7**

| | | Correlations | |
|---|---|---|---|
| **Validation Approach/Research Question** | **CCC Actual (Expected*)** | | **FCC Actual (Expected)** |
| 1 STANDARDS/Key Indicators | VALIDATED | | VALIDATED |
| Key Indicators x Core Rules | .49 (.50+) | | .57 (.50+) |
| Key Indicators x Licensing Studies | .78 (.70+) | | .87 (.70+) |
| 2 MEASURES/Core Rules/ACDW[2] | VALIDATED | | VALIDATED |
| Core Rules x Licensing Studies | .69 (.50+) | | .74 (.50+) |
| Core Rules x ACDW | .76 (.50+) | | .70 (.50+) |
| 3 OUTPUTS/Program Quality | VALIDATED | | NOT VALIDATED |
| Licensing Studies x ERS**/PK | .48 (.30+) | FCCERS | .19 (.30+) |
| Core Rules x ERS/PK | .60 (.30+) | FCCERS | .17 (.30+) |
| Licensing Studies x ERS/PS | ------------ | | .21 (.30+) |
| Core Rules x ERS/PS | ------------ | | .27 (.30+) |

***DMLMA© Expected r Value Thresholds in Order to be Validated (Also see Figure 1 for additional details):***
***High correlations (.70+) = Licensing Studies x Key Indicators.***
***Moderate correlations (.50+) = Licensing Studies x Core Rules; Core Rules x ACDW; Core Rules x Key Indicators; Key Indicators x ACDW.***
***Lower correlations (.30+) = Program Quality Tools x Licensing Studies; Program Quality x Core Rules; Program Quality x Key Indicators.***

**Program Quality Tools = ECERS-R, ITERS-R, FCCERS-R.**

****ERS = ECERS-R + ITERS-R**
**PK = Pre-K program**
**PS= Preschool program**

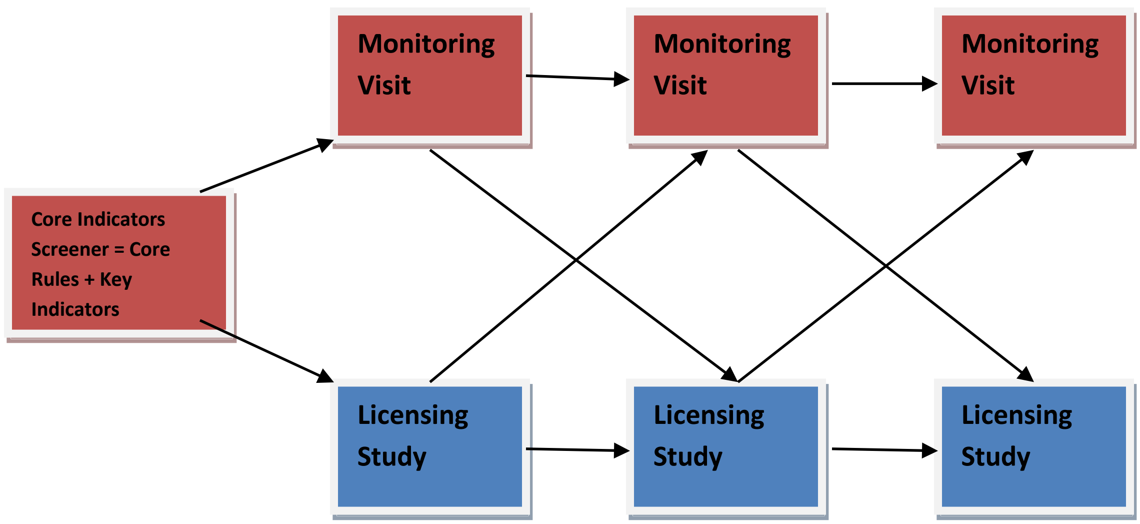
A confounding of data occurred with the first two validation approaches because the Core Rules were influenced a great deal by the National Child Care Key Indicators (NCCKI) (Fiene, 2002) where 10 of the 13 Core Rules overlapped significantly with the NCCKI. This helped to increase the correlation between the Core Rules and the Licensing Studies because the Core Rules represented both risk assessment and key indicator rules. Using both risk assessment and key indicator rules together is an ideal differential monitoring approach (Fiene, 2012). Most states use one or the other but generally not together. By including the newly generated key indicators from this study where there is also overlap with the NCCKI, it should enhance the differential monitoring approach utilized by DECAL.

2. ACDW decisions were compared with using severity as a factor and not using it as a factor in the scoring system with Core Rules. No significant differences were found between the two scoring systems; therefore, the results in this study represent Core Rule scores without severity included since this is the simpler model.

**RECOMMENDATIONS**

The following recommendations[3] can be made from this Licensing Differential Monitoring Validation Study.

1) **First research question/validation recommendation:** Revise the worksheet determination scoring relative to the visiting protocol by combining the Core Rules with a Key Indicator approach so that if any of the Core Rules or Key Indicators are out of compliance, then a full compliance review (Licensing Study) should be used. The present worksheet determination scoring protocol is overly complex. Just moving to a more comprehensive review (Licensing Study) based on non-compliance with the Core Rules will simplify the scoring protocol and make determinations more straightforward. If there is full (100%) compliance with the Core Rules and Key Indicators, then the next scheduled review of the program would be an abbreviated Monitoring Visit. If there is not 100% compliance with the Core Rules and Key Indicators, then the next scheduled review of the program would be a Licensing Study reviewing all child care rules. Based upon the compliance/non-compliance scores of the Licensing Study will determine how often the program will be visited. A revised Georgia Differential Monitoring System could potentially look like the following:




**Compliance Decisions:**

***Core Indicators*** *= Core Rules + Key Indicators – this becomes a screening tool to determine if a program receives a Licensing Study reviewing all child care rules or an abbreviated Monitoring visit continuing to review key indicator and core rules for their next visit.*
***Core Indicators (100%)*** *= the next visit is a Monitoring Visit.. Every 3-4 years a full Licensing Study is conducted.*
***Core Indicators (not 100%)*** *= The next visit is a Licensing Study where all rules are reviewed.*
***Compliance*** *= 96%+ with all rules and 100% with Core Indicators. The next visit is a Monitoring Visit.*
***Non-compliance*** *= less than 96% with all rules. The next visit is a Licensing Study..*

2) **Second research question/validation recommendation:** Follow the development of weighted risk assessment tools as outlined by Fiene & Kroh (2000) in the *NARA Licensing Chapter* for CCC and FCC. It has been over 20 years since Core Rules were weighted. It is recommended that Core Rules be weighted every 10 years. Doing a weighted risk assessment would help confirm that the present Core Rules are the highest risk rules.

3) **Third research question/validation recommendation:** Confirm the CCC (ERS/PS) and FCC results by conducting a more recent program quality study that reflects all the changes made within the CCC and FCC systems. Although FCC program quality and Licensing Study and Core Rules reached statistical significance, the overall correlation was too low (Licensing Studies = .19; Core Rules = .17). With the CCC system the Pre-K program demonstrated significant correlations between ERS/PK and Licensing Study (.48) & Core Rules (.60) but not the Preschool program (ERS/PS: Licensing Studies = .21; Core Rules = .27).

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[3] These recommendations are drawn from the data in this study and previous studies conducted by the author in which the empirical evidence led to similar recommendations.

**REFERENCES**


Fiene (2012). *Differential monitoring logic model and algorithm (DMLMA©).* Middletown, PA: Research Institute for Key Indicators.

Fiene (2007). Child Development Program Evaluation & Caregiver Observation Scale, in T Halle (Ed.), *Early Care and Education Quality Measures Compendium*, Washington, D.C.: Child Trends.

Fiene (2003). Licensing related indicators of quality child care, *Child Care Bulletin*, Winter 2002-2003, pps 12-13.

Fiene (2002). *Thirteen indicators of quality child care: Research update*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services.

Fiene (1985). Measuring the effectiveness of regulations, *New England Journal of Human Services, 5*(2), 38-39.

Fiene (1981). A new tool for day care monitoring introduced by children's consortium, *Evaluation Practice, 1*(2), 10-11.

Fiene & Kroh (2000). Licensing Measurement and Systems, *NARA Licensing Curriculum*. Washington, D.C.: National Association for Regulatory Administration.

Fiene & Nixon (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly, 14*(3), 198-214.

Griffin & Fiene (1995). *A systematic approach to policy planning and quality improvement for child care: A technical manual for state administrators*. Washington, D.C.: National Center for Clinical Infant Programs-Zero to Three.

Harms, T., Cryer, D.R., & Clifford, R.M. (2007). Family child care environment rating scale: Revised edition. New York: Teachers College Press.

Harms, T., Cryer, D., & Clifford, R. M. (2006). *Infant/toddler environment rating scale: Revised edition*. New York: Teachers College Press.

Harms, T., Clifford, R. M., & Cryer, D. (2005). *Early childhood environment rating scale: Revised edition*. New York: Teachers College Press.

Maxwell, K. L., Early, D. M., Bryant, D., Kraus, S., Hume, K., & Crawford, G. (2009a). Georgia study of early care and education: Child care center findings. Chapel Hill, NC: The University of North Carolina at Chapel Hill, FPG Child Development Institute.

Maxwell, K. L., Early, D. M., Bryant, D., Kraus, S., Hume, K., & Crawford, G. (2009b). *Georgia study of early care and education: Findings from Georgia's Pre-K Program.* Chapel Hill, NC: The University of North Carolina at Chapel Hill, FPG Child Development Institute.

Maxwell, K. L., Early, D. M., Bryant, D., Kraus, S., & Hume, K., (2010). Georgia study of early care and education: Family child care findings. Chapel Hill: The University of North Carolina at Chapel Hill, FPG Child Development Institute.

Morgan, Stevenson, Fiene, & Stephens (1986). Gaps and excesses in the regulation of child day care, *Reviews of Infectious Diseases--Infectious Diseases in Child Day Care: Management and Prevention, 8*(4), 634-643.

Zellman, G. L. and Fiene, R. (2012). *Validation of Quality Rating and Improvement Systems for Early Care and Education and School-Age Care,* Research-to-Policy, Research-to-Practice Brief OPRE 2012. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

## TABLE 8 - FOUR APPROACHES TO VALIDATING A QRIS (Zellman & Fiene, 2012)

| Approach | Activities and Purpose | Typical Questions Approach Addresses | Issues and Limitations |
|---|---|---|---|
| ***1. Examine the validity of key underlying concepts*** | Assess whether basic QRIS quality components and standards are the "right" ones by examining levels of empirical and expert support. | Do the quality components capture the key elements of quality?<br><br>Is there sufficient empirical and expert support for including each standard? | Different QRISs may use different decision rules about what standards to include in the system. |
| ***2. Examine the measurement strategy and the psychometric properties of the measures used to assess quality*** | Examine whether the process used to document and verify each indicator is yielding accurate results.<br><br>Examine properties of key quality measures, e.g., inter-rater reliability on observational measures, scoring of documentation, and inter-item correlations to determine if measures are psychometrically sound.<br><br>Examine the relationships among the component measures to assess whether they are functioning as expected.<br><br>Examine cut scores and combining rules to determine the most appropriate ways to combine measures of quality standards into summary ratings. | What is the reliability and accuracy of indicators assessed through program administrator self-report or by document review?<br><br>What is the reliability and accuracy of indicators assessed through observation?<br><br>Do quality measures perform as expected? (e.g., do subscales emerge as intended by the authors of the measures?)<br><br>Do measures of similar standards relate more closely to each other than to other measures?<br><br>Do measures relate to each other in ways consistent with theory?<br><br>Do different cut scores produce better rating distributions (e.g., programs across all levels rather than programs at only one or two levels) or more meaningful distinctions among programs? | This validation activity is especially important given that some component measures were likely developed in low-stakes settings and have not been examined in the context of QRIS. |

## TABLE 8 (CONTINUED)

| Approach | Activities and Purpose | Typical Questions Approach Addresses | Issues and Limitations |
|---|---|---|---|
| ***3. Assess the outputs of the rating process*** | Examine variation and patterns of program-level ratings within and across program types to ensure that the ratings are functioning as intended.<br><br>Examine relationship of program-level ratings to other quality indicators to determine if ratings are assessing quality in expected ways.<br><br>Examine alternate cut points and rules to determine how well the ratings distinguish different levels of quality. | Do programs with different program-level ratings differ in meaningful ways on alternative quality measures?<br><br>Do rating distributions vary by program type, e.g., ratings of center-based programs compared to ratings of home-based programs? Are current cut scores and combining rules producing appropriate distributions across rating levels? | These validation activities depend on a reasonable level of confidence about the quality components, standards and indicators as well as the process used to designate ratings. |
| ***4. Examine how ratings are associated with children's outcomes.*** | Examine the relationship between program-level ratings and selected child outcomes to determine whether higher program ratings are associated with better child outcomes. | Do children who attend higher-rated programs have greater gains in skills than children who attend lower-quality programs? | Appropriate demographic and program level control variables must be included in analyses to account for selection factors.<br><br>Studies could be done on child and program samples to save resources.<br><br>Findings do not permit attribution of causality about QRIS participation but inferences can be made about how quality influences children's outcomes. |

**FIGURE 1- DIFFERENTIAL MONITORING LOGIC MODEL AND ALGORITHM (Fiene, 2012)**
***DMLMA*© Applied to the Georgia Child Care Licensing System**

**CI + PQ => RA + KI => DM**

***Georgia Examples:***

**CI = Comprehensive Tool = Licensing Study (LS – All Rules)**
**PQ = Program Quality Tool = Environmental Rating Scales (ERS = ECERS-R, ITERS-R, FCCERS-R)**
**RA = Risk Assessment Tool = Core Rules (CR)**
**KI = Key Indicators Tool = presently Georgia does not have a KI**
**DM = Differential Monitoring Tool = ACDW (Compliance/Non-Compliance Decision)**

A very important concept in this validation study is that the system employed by DECAL is a risk assessment approach rather than a key indicator methodology which is based upon predictor rules. The *DMLMA*© is a new methodology assessing the effectiveness and efficiency of Differential Monitoring systems being used by state regulatory agencies and provides the conceptual model for this study.

| |
|---|
| ***DMLMA*© Thresholds:**<br>***High Correlations (.70+) = CI x KI.***<br>***Moderate Correlations (.50+) = CI x RA; RA x DM; RA x KI; KI x DM.***<br>***Lower Correlations (.30+) = PQ x CI; PQ x RA; PQ x KI.*** |

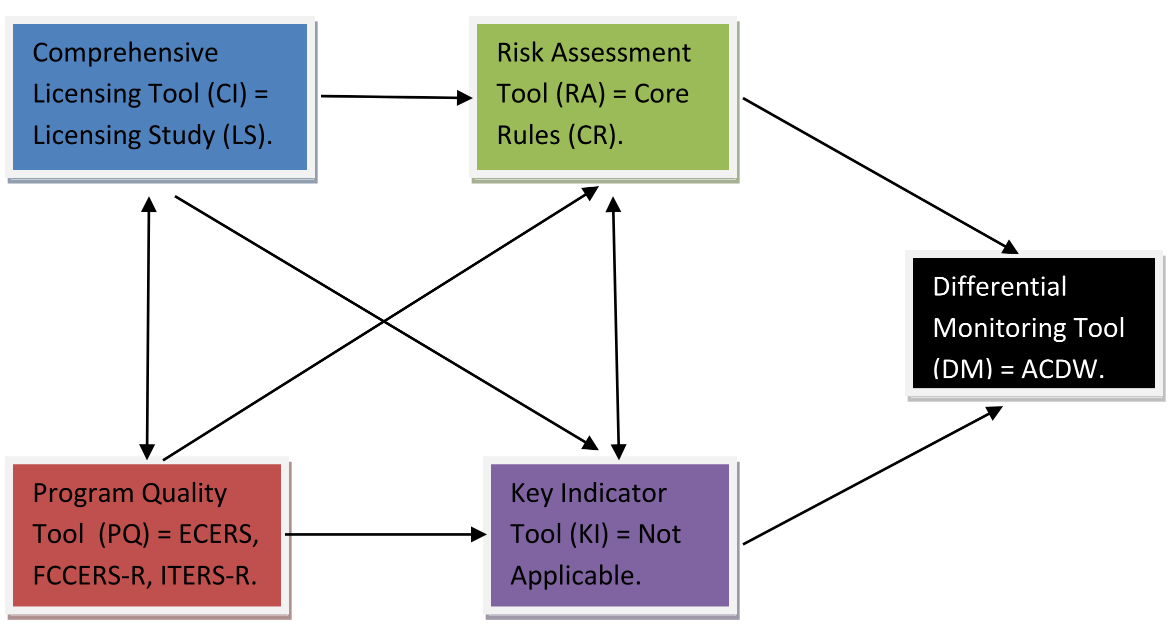

**Table 9 - Listing of Key Indicators for Georgia Child Care Centers with Phi Coefficients**

591-1-1-25 (3) requires that the center and surrounding premises be clean, free of debris and in good repair. (Phi = .49)

591-1-1-.25 (13) requires that hazardous equipment, materials and supplies be inaccessible to children. (Phi = .46)

591-1-1-.26 (6) requires that outdoor equipment be free of hazards such as lead-based paint, sharp corners, rust and splinters. (Phi = .44)

591-1-1-.26 (8) requires the playground to be kept clean, free of litter and hazards. (Phi = .59)

591-1-1.26 (7) requires that a resilient surface be provided and maintained beneath the fall zone of climbing and swinging equipment. (Phi = .57)

591-1-1-.36 (6)(a-c) requires the center to maintain on the vehicle current information for each child including a) center and passenger information; b) emergency medical information and c) a passenger checklist. (Phi = .49)

591-1-1-.14 (1) requires that at least 50% of the caregiver staff have current first aid and CPR training. (Phi = .49)

591-1-1-.08 (a)-(f) requires the center to maintain a file for each child while such child is in care and for one year after that child is no longer enrolled…. (Phi = .44)

**Table 10 - Listing of Key Indicators for Georgia Family Child Care Homes with Phi Coefficients**

290.2.3-.11(2)(C) requires that fire drills be practiced monthly and shall be documented and kept on file for one year. (Phi = .51)

290-2-3-.11 (2)(f) requires that poisons, medicines, cleaning agents and other hazardous materials be in locked areas or inaccessible to children. (Phi = .61)

290-2-3-.11 (1)(f) requires the family day care home and any vehicle used to have a first aid kit….. (Phi = .57)

290-2-3-.07 (4) requires that the provider obtain ten clock hours of training in child care issues from an approved source within the first year and thereafter on an annual basis. (Phi = .58)

290-2-3-.08 (1)(a) requires the family day care home to maintain a file for each child that includes the child's name, birth date, parents or guardian's name, home and business addresses and telephone numbers. (Phi = .63)

290-2-3-.08 (1)(b) requires that the record for each child contain the names(s), address(es) and telephone number(s) of person(s) to contact in emergencies when the parent cannot be reached. (Phi = .57)

290-2-3-.08 (1)(b) requires the family day care home to maintain a file for each child that includes the name, address and telephone number of the child's physician to contact in emergencies. (Phi = .55)

290-2-3-.08 (1)(f) requires the family day care home to maintain a file for each child that includes known allergies, physical problems, mental health disorders, mental retardation or developmental disabilities which would limit the child's participation in the program. (Phi = .51)

290-2-3-.08 (1)(c) requires the family day care home to maintain a file for each child that includes evidence of age appropriate immunizations or a signed affidavit against such immunizations; enrollment in the home may not continue for more than 30 days without such evidence. (Phi = .72)

## Table 11 - Key Indicator Formula Matrix for Generating Key Indicators*

| | *Providers In Compliance on Rule* | *Programs Out Of Compliance on Rule* | *Row Total* |
|---|---|---|---|
| ***High Group**** | ***A*** | ***B*** | ***Y*** |
| ***Low Group***** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | **Grand Total** |

***(* This computation occurred for each licensing rule)***

*******************************************************

## Figure 2 - Key Indicator Statistical Methodology (Calculating the Phi Coefficient)

$$\phi = (A)(D) - (B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

***A = High Group + Programs in Compliance on Specific Rule.***
***B = High Group + Programs out of Compliance on Specific Rule.***
***C = Low Group + Programs in Compliance on Specific Rule.***
***D = Low Group + Programs out of Compliance on Specific Rule.***
***W = Total Number of Programs in Compliance on Specific Rule.***
***X = Total Number of Programs out of Compliance on Specific Rule.***
***Y = Total Number of Programs in High Group.***
***Z = Total Number of Programs in Low Group .***
*****High Group = Top 25% of Programs in Compliance with all Rules.***
******Low Group = Bottom 25% of Programs in Compliance with all Rules.***

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## Table 12 – Phi Coefficient Decision Table

| Phi Coefficient Range | Characteristic of Indicator | Decision |
|---|---|---|
| **(+1.00) – (+.26)** | **Good Predictor** | **Include** |
| **(+.25) – (-.25)** | **Unpredictable** | **Do not Include** |
| **(-.26) – (-1.00)** | **Terrible Predictor** | **Do not Include** |

**Table 13 - Comparison of the Pre-K and Preschool Programs**

| Compliance Level* | Pre-K ECERS-R**(N) | Preschool ECERS-R***(N) |
|---|---|---|
| 100 | 4.88 (4) | 3.40 (15) |
| 99 | 4.13 (6) | 4.35 (7) |
| 98 | 4.38 (6) | 3.89 (13) |
| 97 | 3.99 (4) | 3.15 (9) |
| 96 | 4.36 (2) | 3.16 (13) |
| 95 | 4.60 (2) | 3.53 (5) |
| 90 | 3.43 (2) | 2.56 (5) |
| 80 | 2.56 (1) | 2.38 (2) |

***Compliance Level = the number of child care rule violations subtracted from 100.**

**100 = Full Compliance with Rules**
**99-98 = Substantial Compliance with Rules**
**97-90 = Medium Level of Compliance with Rules**
**80 = Low Level of Compliance with Rules**

****Pre-K ECERS-R = average score of Pre-K Program classrooms as compared to the respective compliance levels. (N) = Sample Size.**

*****Preschool ECERS-R = average score of Preschool Program classrooms as compared to the respective compliance levels. (N) = Sample Size.**

From this comparison there is more of a linear relationship between compliance levels and ECERS-R average scores for Pre-K Program classrooms than with the Preschool Program classrooms where there is more of a curvilinear or plateau effect at the upper end of compliance levels (Full Compliance). In order to attain the necessary correlational thresholds (+.30+) for validation for the third approach to validation, having a linear relationship rather than curvilinear will enhance this occurring. When a curvilinear or plateau effect occurs there is too great a likelihood that programs at a medium level of quality will be introduced into the highest (full) level of compliance. From a public policy standpoint this is an undesirable result.

The other item to note with the data distributions is that the Preschool ECERS-R data are more restricted than the Pre-K Program ECERS-R data. In other words, there is less variance in the Preschool Program ECERS-R data than in the Pre-K Program ECERS-R data.

There is an important limitation in these data that the reader must be aware of in not drawing any conclusions that the presence of a Pre-K Program classroom in any way is causing the change in licensing compliance. There is a relationship between the two but there is no assumption of causality.

## Georgia Licensing Validation Technical Elements Appendix

Because of the nature of this report being a state's first attempt at fully validating it's Child Care Licensing Core Rule Differential Monitoring Approach utilizing the Zellman & Fiene (2012) Validation Framework and Fiene's DMLMA (2012) Model, certain questions surfaced regarding the terminology and the methodology being used in this report. This Technical Elements Appendix provides answers to specific questions that have been raised regarding these methodologies.

1. *How were the multiple years of data handled?*

The Licensing Study data used to make the comparisons are the facility reports that were the earliest facility observations so that these data would be closest to when the program quality data were collected. The other more recent Licensing Studies were not used in this comparison.

2. *If the Core Rules, Key Indicator, and Licensing Study values are counts of violations, how was the fact that different sites had different numbers of visits handled?*

Because only the earliest Licensing Study data was used, the number of visits were not an issue in the scoring.

3. *If the Core Rules, Key Indicator, and Licensing Study values are counts of violations, were all levels of violation risk (low, medium, high, extreme) handled the same?*

Yes, there were very few occurrences of high and extreme in the data base and also no significant differences were found when a sample of the rule violations with and without the levels of violation risk were compared. Therefore the simpler formula in which levels of violation risk were not used was selected.

4. *How did you determine the minimum correlations (DMLMA thresholds) for each analysis? Was this computed separately for this analysis or are the minimum correlations based on previous work?*

The DMLMA thresholds were determined from previous research work conducted by the author of this study on this model over the past 30 years. These were the average correlational thresholds that have been proposed for making validation determinations. The reason for utilizing the DMLMA model and thresholds is that the Zellman & Fiene (2012) Framework provides guidance in how to select specific validation approaches, what are the specific questions answered by the approach and what are the limitations of the particular approach. The DMLMA model builds upon this but provides a suggested scoring protocol by comparing correlational thresholds in a specific state to historical trends.

5. *Was Phi calculated for every rule in the licensing study? Can the full list be added to the appendix?*

Yes, Phi was calculated for every rule in the licensing study but most of them could not be computed because there was so few rule violations in the majority of the rules. This is typical of state licensing data sets and the full Phi comparisons are not depicted because it does not add any information to the state report.

*6. How did you determine which of the Licensing Study rules should be counted as Key Indicators?*

The Key Indicator statistical methodology based upon a specific cut off point for the Phi Coefficient in which the p values were .0001 or less. This is a very stringent cut off point but it has been found historically that the p values needed to be lowered as the data distributions became more skewed with programs overall compliance levels increasing over time.

*7. How were sites that had no infant/toddler (i.e., no ITERS score) handled for the third validation approach? How were sites that had only a GA Pre-K (no preschool) handled?*

For scoring purposes only those facilities that had both the ECERS and ITERS scores were used in making comparisons with the licensing data related to the third approach to validation. The GA Pre-K were scored and compared in the same way.

*8. On Table 13, why is the number of violation subtracted from 100 (rather than from the maximum possible)?*

Generally this scoring is done because it is more intuitive to think in terms of 100% in compliance as a score of "100" rather than a score of "0". This conversion is used in all state licensing reports that involve the DMLMA, Key Indicators and Risk Assessment Models.

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**Relationship of Size of ECE Programs, Non-Compliance (NC) with Licensing Rules, and QRIS Scores in the State of Washington: RIKI Technical Research Note**

**Richard Fiene, Ph.D.**

**November 2017**

A question regarding the size of an early care and education (ECE) program and overall compliance with licensing rules was asked by ECE providers in the State of Washington. The purpose of this technical research note is to answer this question and other associated questions.

State of Washington staff pulled a random sample of approximately 200 ECE providers representing the state as a whole. Various descriptive and correlational analyses were used to analyze any relationships amongst the data.

Based upon the following chart (**Chart 1**) it is clear that there is no relationship between the size of an ECE program and the level of non-compliance with licensing rules (r = .113; -.017; .178 are all non-significant results). What are significant results are the correlations across the years of the non-compliance with licensing rules as one would expect (r = ***.747; .623; .47*** are all significant at the $p < .0001$ level).

**Chart 1 – Correlations of ECE Size of Program and Non-Compliance with Licensing Rules**

| | **Size** | **NC1** | **NC2** |
|---|---|---|---|
| **NC1** | 0.113 | | |
| **NC2** | -0.017 | ***0.747*** | |
| **NC3** | 0.178 | ***0.623*** | ***0.47*** |

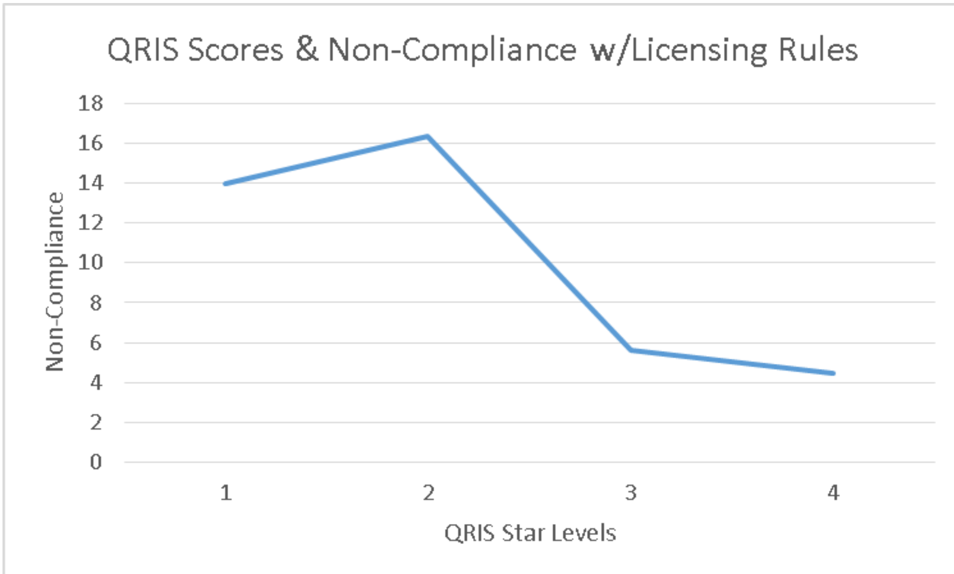
***NC1 = Year 1 non-compliance (NC) with licensing rules data collection***

***NC2 = Year 2 non-compliance (NC) with licensing rules data collection.***

***NC3 = Year 3 non-compliance (NC) with licensing rules data collection.***

Another very interesting question asked by State of Washington staff was the relationship between QRIS scores and non-compliance (NC) with licensing rules. The correlation did reach significance ($r = -.36$; $p < .008$) and there is definitely a trend in the data when graphed (see **Figure 1)**. This trend demonstrates that as the QRIS Star Level increases, overall non-compliance with licensing rules decreases.

**Figure 1 – Relationship Between QRIS Scores and Non-Compliance (NC) with Licensing Rules**




In further analyses there also was a significant correlation between the size of an ECE program and QRIS scores (r = .47). And when the Star levels (1-4) were compared via One-Way ANOVA for non-compliance with licensing rules, a significant difference was found ($p < .05$)(see **Chart 2**). This is the first demonstration of a positive relationship between QRIS (Program Quality) and Licensing (Program Rule Compliance). As the Star Level increases, there is a corresponding increase in the compliance with Licensing Rules.

**Chart 2 – QRIS Scores and Non-Compliance with Licensing Rules (PC x PQ)**

| **QRIS Stars** | **NC1a** | **NC2a** | **NC3a** | **NC13** |
|---|---|---|---|---|
| **1** | 14.23 | 17.62 | 10.15 | ***14.00*** |
| **2** | 22.50 | 14.00 | 12.50 | ***16.33*** |
| **3** | 6.31 | 4.25 | 6.31 | ***5.62*** |
| **4** | 5.23 | 4.31 | 3.92 | ***4.49*** |

**NC13 = NC1a + NC2a + NC3a where NC13 is an overall mean of the three years of data.**

**NC1a, NC2a, and NC3a are means for each of the year's data.**

**Indiana Key Indicators for Centers, Homes, Legally Licensed Exempt Homes (LLEP), and Ministry Facilities**

**Richard Fiene, Ph.D.**

**National Association for Regulatory Administration**

**Research Institute for Key Indicators**

**January 2019**

The purpose of this report is to provide the five sets of Key Indicators for Centers, Homes, Legally Licensed Exempt Homes (LLEP), Ministry CCDF (Child Care Development Fund) and Registered Ministry facilities for the state of Indiana. The report will provide basic demographic information of each set of rules and then the specific statistical key indicators based upon the Fiene KIS Statistical Algorithms. The creation of these respective Licensing Key Indicators was from 5 data sets sent from Indiana to the author representing one year of complete data (November 2017-October 2018) on each set of rules for centers, homes, LLEP, Ministry CCDF, and registered Ministry facilities.

The Fiene KIS Statistical Algorithm and Methodology has been in use for over forty years and has been used throughout the USA and Canada to help states and provinces streamline their licensing and monitoring systems. It is presently in a fourth generation of development taking into account lessons learned over the past 40 years of research and development. Presently, the methodology is housed within the Research Institute for Key Indicators (RIKILLC) which is in strategic partnership with the National Association for Regulatory Administration (NARA) for the further development and dissemination of the KIS methodology.

The KIS methodology creates a 2 x 2 matrix for each rule and compares it to the relative frequency of overall compliance. Based upon this algorithm, specific rules are identified as key indicator rules being able to statistically predict overall compliance with other rules. The following five sets of rules have been run through these algorithms utilizing the 2017-2018 data.

**Centers**

The center rules represent a data base of over 2000 rules taken from over 500 facilities in which the average number of rule violations per facility was 5.26. The range of violations was from 0 to 51. Thirteen (13%) percent of the facilities had no violations. See the Appendix for a graphical display.

**Homes**

The home rules represent a data base of over 500 rules taken from over 2000 facilities in which the average number of rule violations per facility was 2.27. The range of violations was from 0 to 34. Forty (40%) percent of the facilities had no violations. Please see the Appendix for a graphical display of the range of violations.

**Registered Ministry**

The registered ministry rules represent a data base of over 300 rules taken from over 1000 facilities in which the average number of rule violations per facility was 3.04. The range of violations was from 0 to 20. Twenty-six (26%) percent of the facilities had no violations.

**Ministry CCDF**

The ministry CCDF applicable rules represent a data base of approximately 40 rules taken from just over 500 facilities in which the average number of rule violations per facility was 4.51. The range of violations was from 0 to 44. Thirty-one (31%) percent of the facilities had no violations.

**LLEP**

The LLEP rules represent a data base of just under 40 rules taken from just over 500 facilities in which the average number of rule violations per facility was 1.09. The range of violations was from 0 to 24. Sixty-five (65%) percent of the facilities had no violations.

**The Key Indicators**

**Centers**

| ***Rule*** | ***Phi**** | ***Summary Content***** |
|---|---|---|
| 470 IAC 3-4.7-100 | .59 | Hazard Items |
| 470 IAC 3-4.7-101 | .33 | Electrical Safety |
| 470 IAC 3-4.7-113 | .51 | Bathrooms |
| 470 IAC 3-4.7-114 | .34 | Water Supply and Plumbing |
| 470 IAC 3-4.7-116 | .66 | Kitchen and Food Preparation |
| 470 IAC 3-4.7-13 | .36 | Reporting Child Abuse & Neglect |
| 470 IAC 3-4.7-135 | .35 | Infant Food Preparation & Storage |
| 470 IAC 3-4.7-32 | .26 | Staff Orientation |
| 470 IAC 3-4.7-36 | .47 | Children's Administrative Records |
| 470 IAC 3-4.7-41 | .42 | Staff, Substitutes & Volunteer Records |
| 470 IAC 3-4.7-48 | .26 | Staff Child Ratios |
| 470 IAC 3-4.7-60 | .27 | Written Program Plans |
| 470 IAC 3-4.7-63 | .42 | Education Equipment & Materials |

| | | |
|---|---|---|
| 470 IAC 3-4.7-66 | .41 | Playground & Outdoor Safety |
| 470 IAC 3-4.7-99 | .56 | Building Maintenance |

**Homes**

| ***Rule*** | ***Phi*** | ***Summary Content*** |
|---|---|---|
| 470 IAC 3-1.1-28.5(c)(1) | .63 | TB Test |
| 470 IAC 3-1.1-32(a)(3) | .37 | Criminal History |
| 470 IAC 3-1.1-32(a)(5) | .56 | CPR/First Aid |
| 470 IAC 3-1.1-32(a)(6)(a) | .48 | Enrollment |
| 470 IAC 3-1.1-32(a)(6)(d) | .25 | Adults authorized to pick up |
| 470 IAC 3-1.1-33.5(b)(3) | .32 | Training Child Abuse & Neglect |
| 470 IAC 3-1.1-33.5(d) | .31 | Pediatric CPR Training Certification |
| 470 IAC 3-1.1-34(a) | .39 | Adult Physical Exam |
| 470 IAC 3-1.1-37(a)(1) | .26 | Parent Sign Enrollment Form |
| 470 IAC 3-1.1-37(a)(2) | .31 | Release Medical |
| 470 IAC 3-1.1-37(b)(1) | .49 | Child Participation Activities |
| 470 IAC 3-1.1-37(b)(2) | .43 | Immunizations |
| 470 IAC 3-1.1-40(a) | .25 | Trip Permissions |
| 470 IAC 3-1.1-41(a) | .32 | Discipline Policy to Parents |
| 470 IAC 3-1.1-45(a) | .52 | Hazard Free |
| 470 IAC 3-1.1-48(c)(1) | .30 | Inaccessible Cleaning Supplies |
| IC 12-17.2-5-3(d)(2)(e) | .30 | Criminal History |
| IC 12-17.2-5-3.5(a)(1) | .39 | Drug Testing |

***Registered Ministry***

| ***Rule*** | ***Phi*** | ***Summary Content*** |
|---|---|---|
| 470 IAC 3-4.5-4(1) | .97 | Surfaces Clean |
| 470 IAC 3-4.5-4(2) | .62 | Bathrooms, Sinks, Toilets |
| 470 IAC 3-4.5-4(4) | .28 | Screens in Windows |

| | | |
|---|---|---|
| 470 IAC 3-4.5-5(a) | .34 | Food Services Clean |
| 470 IAC 3-4.5-5(b) | .27 | Food Safety |
| 470 IAC 3-4.5-5(c) | .38 | Refrigerator & Freezer |
| 470 IAC 3-4.5-(e)(2) | .42 | Cleaning |
| 470 IAC 3-4.5-5(f) | .60 | Food Storage |
| 470 IAC 3-4.5-5(g) | .33 | Hand Washing Hygiene |
| 470 IAC 3-4.5-6(a) | .31 | Cribs |
| 470 IAC 3-4.5-6(b) | .40 | Handwashing |
| 470 IAC 3-4.5-6(c) | .34 | Ill Children |
| 470 IAC 3-4.5-6(d) | .50 | Diapering |
| IC12-17.2-6-11(a)(2) | .48 | Immunizations |
| IC12-17.2-6-14(1) | .38 | Criminal History Check |
| IC12-17.2-6-14(2)(c) | .39 | Allegation of Child Abuse/Neglect |
| IC12-17.2-6-7 | .31 | Enrollment Records |

***Ministry CCDF***

| ***Rule*** | ***Phi*** | ***Summary Content*** |
|---|---|---|
| IC 12-17.2-3.5-10(b)(1)&(2) | .31 | Fire Drills |
| IC 12-17.2-3.5-6 | .62 | TB Test |
| IC 12-17.2-3.5-8 | .67 | CPR |
| IC 12-17.2-3.5.5(a)(2) | .34 | Running Water |
| IC 12-17.2-3.5-11(a) | .75 | Hazard Free |
| IC 12-17.2-3.5-4.1 | .61 | Child Abuse Registry |
| IC 12-17.2-3.5-12 | .58 | Fingerprints |
| IC 12-17.2-3.5-11.1 | .64 | Immunizations |
| IC 12-17.2-3.5-12.1 | .74 | No Smoking/Drugs |
| IC 12-17.2-3.5-5.5(a) | .50 | Supervision |
| IC 12-17.2-3.5-5.5(b) | .74 | Infant/Toddler Training |
| IC 12-17.2-3.5-7(b) | .52 | Discipline |

| | | |
|---|---|---|
| IC 12-17.2-3.5-8(b)(3) | .65 | Child Abuse and Neglect |
| IC 12-17.2-3.5-8(b)(4) | .86 | Orientation |
| IC 12-17.2-3.5-5(c)&(d) | .51 | Transportation |
| IC 12-17.2-3.5-5(c) | .67 | Records |

***LLEP***

| ***Rule*** | ***Phi*** | ***Summary Content*** |
|---|---|---|
| 12-17.2-3.5-8 | .69 | CPR Certification |
| 12-17.2-3.5-4.1 | .25 | State Registry |
| 12-17.2-3.5-12 | .26 | Finger prints |
| 12-17.2-3.5-12.1 | .44 | Drug Test |
| 12-17.2-3.5-5.5(a) | .28 | Supervision |
| 12-17.2-3.5-7(b) | .30 | Discipline |
| 12-17.2-3.5-8(b)(3) | .31 | Child Abuse and Neglect |
| 12-17.2-3.5-8(c) | .32 | Records |
| 12-17.2-3.5-5(e) | .35 | Daily Activities |
| 12-17.2-3.5-6 | .44 | TB Test |

* All results significant at p < .001.

** See Appendix for detailed content.

**Conclusion**

The above results provide Indiana staff with the Key indicators for their respective licensing rules for Centers (15), Homes (18), LLEP (10), and Ministry (CCDF16/17) facilities. There is a good deal of overlap in the Key Indicators for the various service types (Centers, Homes, LLEP, Ministry Programs). This is usually the case with Key Indicators in that they are very consistent across service types and over time. It appears that non-optimal performing facilities have difficulty complying with these KI Rules. Also, the Indiana KI Rules overlap very nicely with the original 13 Key Indicators of Quality Care published by ASPE in 2002. Again, this is not surprising and has been a consistent result over the years.

I have reported all the Key Indicators that were significant at the p < .001 level of significance. Indiana staff can decide if they want to use all the Key Indicators for each service type or be more selective in only using the most significant Key Indicators. For example, with the Ministry and LLEP Rules, there are many more Key Indicators than usual for the total number of rules.

Please see the Appendix for the KIS Algorithm used for determining the above indicators.

## APPENDIX

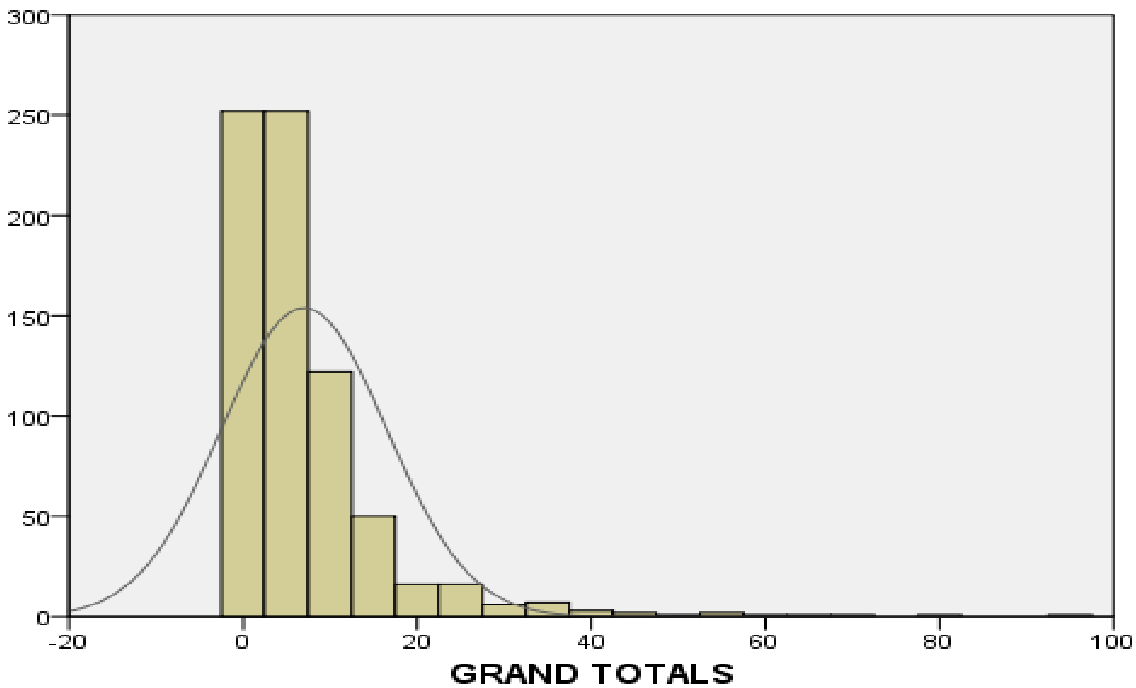
### Theory of Regulatory Compliance Algorithm (Fiene KIS Algorithm)

1) ΣR = C
2) Review C history x 3 yrs
3) NC + C = CI
4) If CI = 100 -> KI
5) If KI > 0 -> CI or if C < 100 -> CI
6) If RA (NC% > 0) -> CI
7) KI + RA = DM
8) KI = ((A)(D)) - ((B)(E)) / sqrt ((W)(X)(Y)(Z))
9) RA = ΣR1 + ΣR2 + ΣR3 + ….. ΣRn / N
10) (TRC = 99%) + (ϕ = 100%)
11) (CI < 100) + (CIPQ = 100) -> KI (10% CI) + RA (10-20% CI) + KIQP (5-10% of CIPQ) -> OU

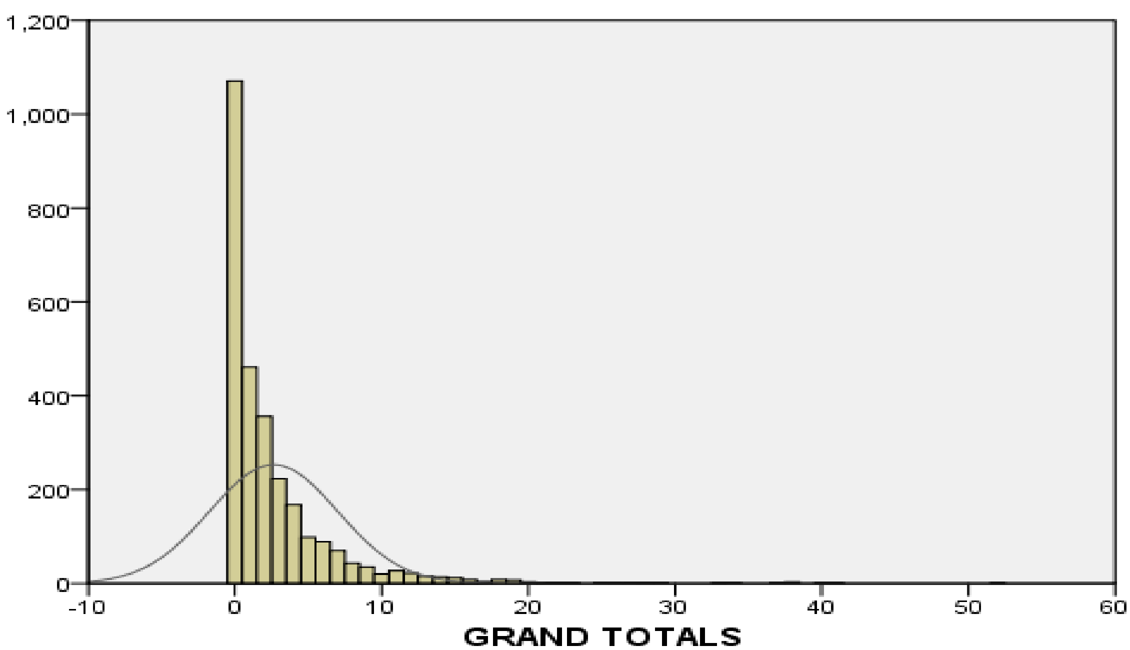
***Legend:***

R = Rules/Regulations/Standards
C = Compliance with Rules/Regulations/Standards
NC = Non-Compliance with Rules/Regulations/Standards
CI = Comprehensive Instrument for determining Compliance
ϕ = Null
KI = Key Indicators; KI >= .26+ Include; KI <= .25 Null, do not include
RA = Risk Assessment
ΣR1 = Specific Rule on Likert Risk Assessment Scale (1-8; 1 = low risk, 8 = high risk)
N = Number of Stakeholders
DM = Differential Monitoring
TRC = Theory of Regulatory Compliance
CIPQ = Comprehensive Instrument Program Quality
KIPQ = Key Indicators Program Quality
OU = Outcomes
A = High Group + Programs in Compliance on Specific Compliance Measure (R1...Rn).
B = High Group + Programs out of Compliance on Specific Compliance Measure (R1...Rn).
E = Low Group + Programs in Compliance on Specific Compliance Measure (R1...Rn).
D = Low Group + Programs out of Compliance on Specific Compliance Measure (R1...Rn).
W = Total Number of Programs in Compliance on Specific Compliance Measure (R1...Rn).
X = Total Number of Programs out of Compliance on Specific Compliance Measure (R1...Rn).
Y = Total Number of Programs in High Group (ΣR = 98+).
Z = Total Number of Programs in Low Group (ΣR <= 97).
High Group = Top 25% of Programs in Compliance with all Compliance Measures (ΣR).
Low Group = Bottom 25% of Programs in Compliance with all Compliance Measures (ΣR).

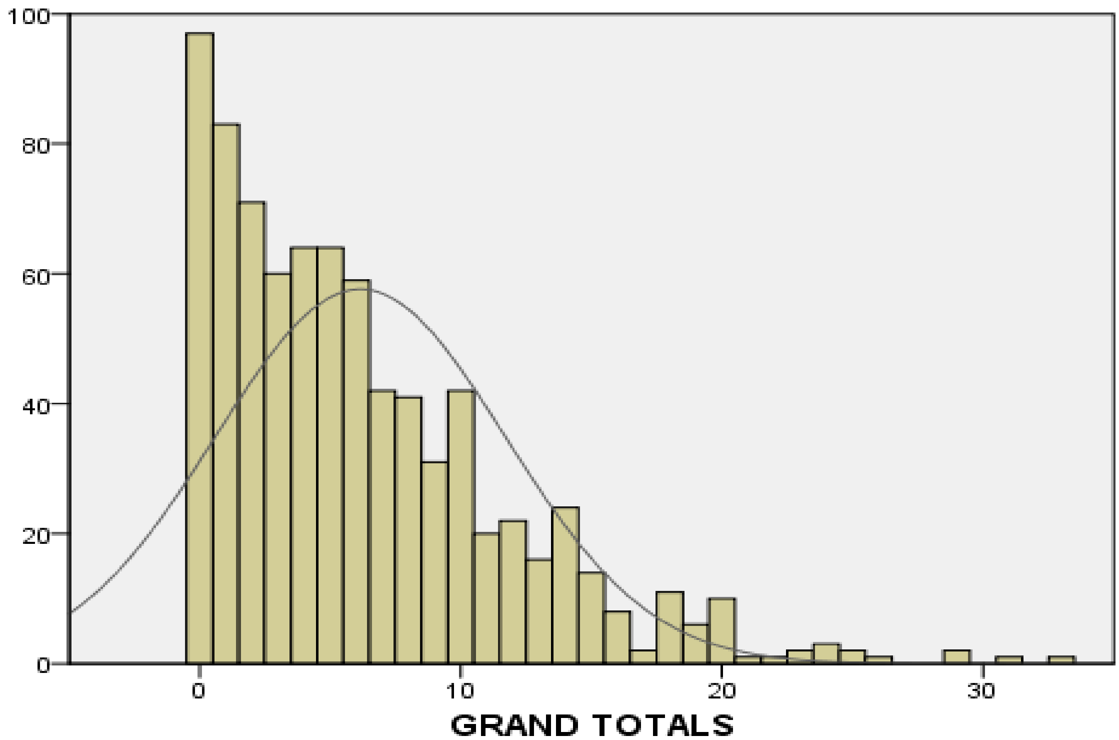
**Centers Total Number of Violations**



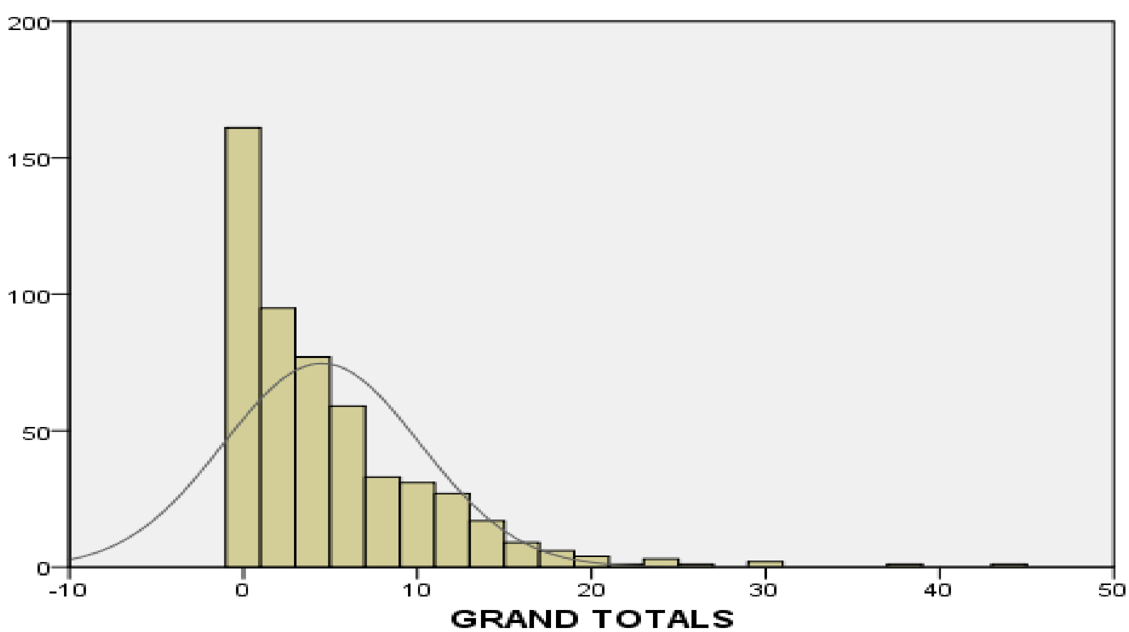

**Homes Total Number of Violations**



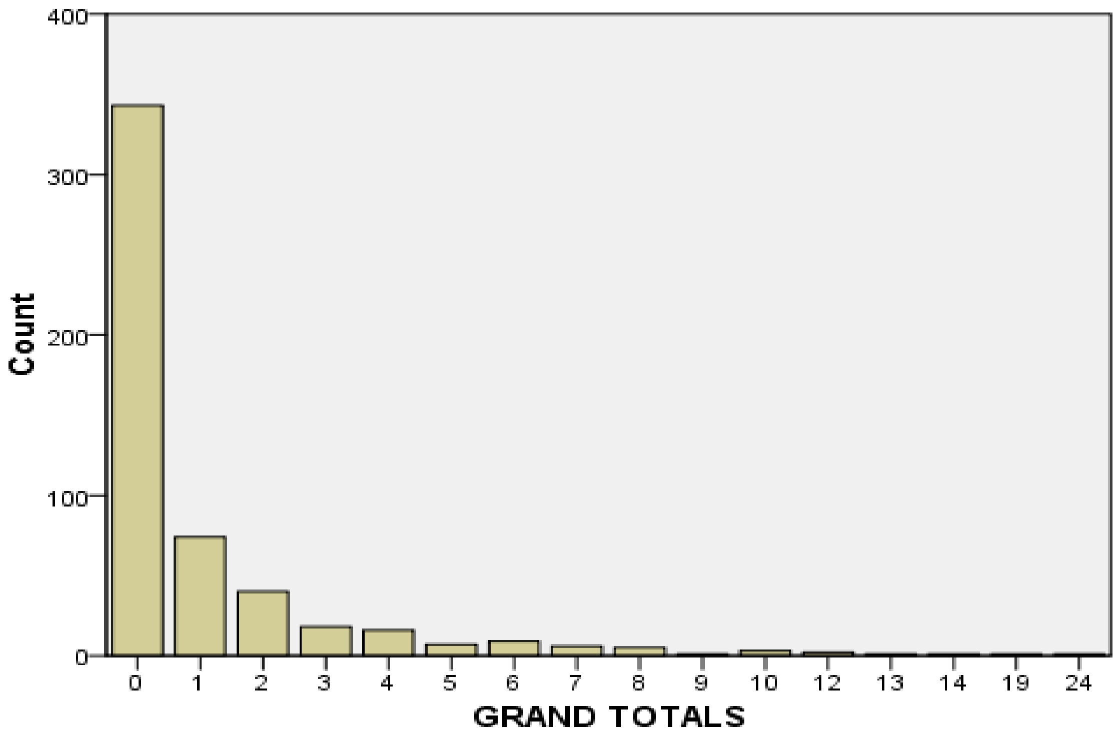
**Registered Ministry Total Number of Violations**




**Ministry CCDF Total Number of Violations**



**LLEP Total Number of Violations**




The above graphical displays clearly demonstrate the skewness in the licensing data. This is typical of licensing data throughout the USA and Canada.

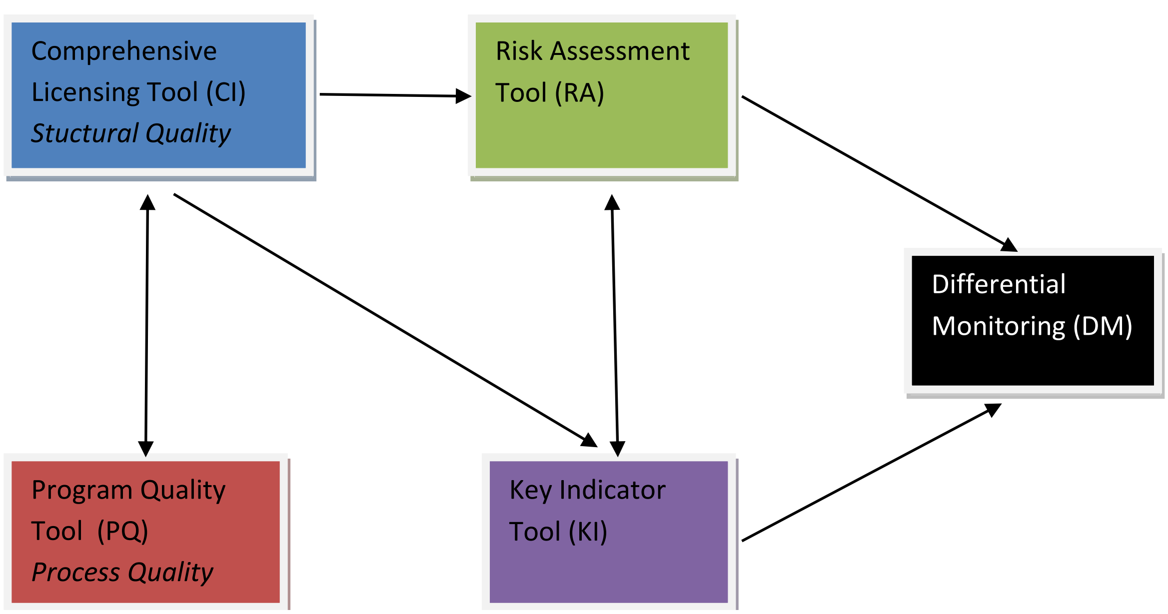
The following graphic on the next page displays the Logic Model and Algorithm for designing and implementing the differential monitoring approach.

# DIFFERENTIAL MONITORING LOGIC MODEL & ALGORITHM (DMLMA©) (Fiene, 2012): A 4th Generation ECPQIM – Early Childhood Program Quality Indicator Model

## CI x PQ => RA + KI => DM + PD => CO

Definitions of Key Elements:

CI = Comprehensive Licensing Tool (Health and Safety)(***Caring for Our Children***)
PQ ***= ECERS-R, FDCRS-R, CLASS, CDPES*** (Caregiver/Child Interactions/Classroom Environment)
RA = Risk Assessment, (High Risk Rules)(***Stepping Stones***)
KI = Key Indicators (Predictor Rules***)(13 Key Indicators of Quality Child Care***)
DM = Differential Monitoring, (How often to visit and what to review)
PD = Professional Development/Technical Assistance/Training
CO = Child Outcomes (Complaints, Injuries, Developmental Measures)



## Key Indicator Rule Details for Each Set of Rules

**Center Key Indicator Rules:**

470 IAC 3-4.7-100 Poisons, chemicals, and hazardous items

470 IAC 3-4.7-101 Electrical safety

470 IAC 3-4.7-113 Bathrooms

470 IAC 3-4.7-114 Water Supply and Plumbing

470 IAC 3-4.7-116 Kitchen and Food Preparation Areas

470 IAC 3-4.7-13 Reporting Child Abuse & Neglect

470 IAC 3-4.7-135 Infant Food Preparation & Storage

470 IAC 3-4.7-32 Staff Orientation

470 IAC 3-4.7-36 Children's Admission Records

470 IAC 3-4.7-41 Staff, Substitutes & Volunteer Records

470 IAC 3-4.7-48 Staff Child Ratios and Supervision

470 IAC 3-4.7-60 Written Program Plans

470 IAC 3-4.7-63 Education Equipment & Materials

470 IAC 3-4.7-66 Playground & Outdoor Safety

470 IAC 3-4.7-99 Building Maintenance

**Homes Key Indicator Rules:**

470 IAC 3-1.1-28.5(c)(1) TB Test - The caregiver shall maintain and make available verification of the following: Annual Mantoux tuberculin test or chest x-ray for direct child care providers and all family members over eighteen (18) years of age.

470 IAC 3-1.1-32(a)(3) Criminal History - The licensee shall maintain the following documentation in the child care home for review by the COFC: Documentation of criminal history checks on employees, volunteers, and all household members who are at least eighteen (18) years of age.

470 IAC 3-1.1-32(a)(5) CPR/First Aid - The licensee shall maintain the following documentation in the child care home for review by the COFC: Documentation of certification of a current first aid course, training in Universal Precautions, and annual CPR certification by direct child care providers.

470 IAC 3-1.1-32(a)(6)(a) Enrollment - Enrollment form for each child receiving services which shall include the following: Childs name and date of birth.

470 IAC 3-1.1-32(a)(6)(d) Adults authorized to pick up - Enrollment form for each child receiving services which shall include the following: The names of adults authorized to pick the child up from the home.

470 IAC 3-1.1-33.5(b)(3) Training Child Abuse & Neglect - Direct child care providers, including volunteers, shall receive training in the following within thirty (30) days of starting employment or volunteer work: Procedures for preventing, detecting, and reporting suspected child abuse and neglect.

470 IAC 3-1.1-33.5(d) Pediatric CPR Training Certification - At least one (1) direct child care provider shall be trained in pediatric cardiopulmonary resuscitation training annually and shall be on the premises at all times.

470 IAC 3-1.1-34(a) Adult Physical Exam - Direct child care providers who work in the home more than three (3) times a month and all members of the household having direct contact with children receiving care shall have an initial physical examination by a physician or certified nurse practitioner indicating that they are free from communicable disease, have no physical or other condition which would endanger the health or welfare of children in care, and have an annual Mantoux tuberculin test or chest x-ray.

470 IAC 3-1.1-37(a)(1) Parent Sign Enrollment Form - Prior to acceptance of children, the caregiver shall have the parent or legal guardian: complete and sign an enrollment form for the child.

470 IAC 3-1.1-37(a)(2) Release Medical - Prior to acceptance of children, the caregiver shall have the parent or legal guardian: complete and sign a release for emergency medical care for the child.

470 IAC 3-1.1-37(b)(1) Child Participation Activities - Within thirty (30) days of a childs admission, the licensee shall receive a written statement from the childs parent or legal guardian signed by a physician or a certified nurse practitioner which states the following: That the child can participate in the child care homes activities.

470 IAC 3-1.1-37(b)(2) Immunizations - Within thirty (30) days of a childs admission, the licensee shall receive a written statement from the childs parent or legal guardian signed by a physician or a certified nurse practitioner which states the following: That the child has had immunizations which are up-to-date for the childs age.

470 IAC 3-1.1-40(a) Trip Permissions - Caregiver shall obtain written parental permission before taking a child away from the child care home for field trips or any other activities.

470 IAC 3-1.1-41(a) Discipline Policy to Parents - The licensee shall provide the parent or legal guardian with a written copy of the discipline policy of the child care home.

470 IAC 3-1.1-45(a) Hazard Free - The licensee shall ensure that no conditions exist in the home or on the grounds where child care services are provided that would endanger the health, safety, or welfare of the children.

470 IAC 3-1.1-48(c)(1) Inaccessible Cleaning Supplies - Caregiver shall keep poisonous or hazardous materials that would harm children, including, but not limited to: cleaning supplies.

IC 12-17.2-5-3(d)(2)&(e) Criminal History - An applicant must submit the necessary information, forms, or consents for the division to: obtain a national criminal history background check on the applicant through the state police department under IC 10-13-3-39.

IC 12-17.2-5-3.5(a)(1) Drug Testing - A child care home shall, at no expense to the state, maintain and make available to the division upon request a copy of drug testing results for: the provider.

**<u>Registered Ministry Key Indicator Rules:</u>**

470 IAC 3-4.5-4(1) Surfaces Clean - All interior surfaces, equipment, materials, furnishings, and objects with which children will come in contact shall be well maintained, in a clean and sanitary condition, and of nontoxic durable construction.

470 IAC 3-4.5-4(2) Bathrooms, Sinks, Toilets - All restrooms shall be equipped with flush toilets and handwashing sinks and shall be ventilated to the outside. An adequate supply of water, under pressure, shall be provided at all handwashing sinks, as well as soap and disposable paper towels in dispensers. Toilet paper in dispensers shall be located at each toilet.

470 IAC 3-4.5-4(4) Screens in Windows - All open windows, doors which are kept open for other than entering and leaving, ventilators, and other outside openings shall be protected against insects by securely fastened 16 mesh screening. Cracks shall be sealed and sealing shall be in place around pipes, plumbing, and ducts.

470 IAC 3-4.5-5(a) Food Services Clean - Food Service. The kitchen and any other food preparation area shall be maintained in a clean and sanitary condition, separate from areas used for any other purpose, and shall be so located that it is not used as a throughway to other rooms or areas. The kitchen shall not be used for children's activities or naps, a dining or recreational area for adults, or as an office.

470 IAC 3-4.5-5(b) Food Safety - Food Safety. All foods provided by the facility, for children enrolled in the day care ministry, shall be from a food establishment, inspected and approved by a governmental agency. Food items shall be received at the facility in the original, unopened, undamaged packaging and shall be properly protected from damage and potential contamination. Food shall be free from spoilage, filth, or other contamination and shall be safe for human consumption. The temperature of all potentially hazardous food shall be 45 F. or below or 140 F. or above at all times. Frozen food shall be kept frozen and should be stored at a temperature of 0 F. or below.

470 IAC 3-4.5-5(c) Refrigerator & Freezer - Refrigerator and Freezers. Enough conveniently located refrigeration facilities shall be provided to assure the maintenance of potentially hazardous food at required temperatures during storage. Refrigerators and freezers shall be in good condition, clean, and shall maintain the proper temperatures. Each compartment of the refrigerator and freezer shall be provided with an accurate thermometer, in good position for daily monitoring.

470 IAC 3-4.5-(e)(2) Cleaning - immersion for at least one (1) minute in clean water which is at a temperature of at least 75 F. and which contains an approved sanitizing agent at an effective concentration. Cleaned and sanitized equipment and utensils shall always be air dried, never towel dried. An alternative to dishwashing is the use of sturdy, all disposable, single-service articles and utensils. Reuse of single-service articles and utensils is prohibited. All permanent ware infant feeding

bottles and reusable nipples provided by the facility shall be washed and sanitized by the facility after each use as follows: Prewash in hot detergent water in a non-handwashing sink; scrub bottles and nipples inside and out with bottle and nipple brush; squeeze water through nipple hole during washing; and rinse well with clean, hot water. Boil in clear water bottles for five (5) minutes; nipples and caps, collars, and tongs for three (3) minutes; and air dry. Store each item separately in clean, covered, labeled container.

470 IAC 3-4.5-5(f) Food Storage - Storage. Containers and packages of food, cleaned and sanitized utensils, equipment, and single-service articles shall be stored at least six (6) inches above the floor in a clean, dry location in such a way that protects them from contamination, cleaning compounds, and toxic or hazardous materials. This does not apply to cased food packaged in waterproof containers.

470 IAC 3-4.5-5(g) Hand Washing Hygiene - Hygiene. A sink used exclusively for handwashing shall be located in the kitchen and supplied with soap and disposable towels from a dispenser. Persons who prepare, handle, and serve food shall thoroughly wash their hands with soap and water and use disposable towels for drying. Handwashing shall be done before starting work and as often as necessary to keep them clean. Persons who prepare and handle food shall wear clean, washable garments (aprons or smocks) and effective hair restraints. All food preparation and eating surfaces shall be sanitized before and after use.

470 IAC 3-4.5-6(a) Cribs - Cots and Cribs. Cots and cribs shall be constructed of sturdy, cleanable material and sanitized after each use; weekly sanitation of a cot or crib is acceptable if the cot or crib is used exclusively by the same child each day. Not more than one (1) child may occupy a crib or cot at any one (1) time. Linens and coverings shall be kept clean.

470 IAC 3-4.5-6(b) Handwashing - Handwashing. Adults and children shall wash their hands after using the toilet and before eating.

470 IAC 3-4.5-6(c) Ill Children - Ill Children. Ill children shall be kept separate from others and all surfaces and items with which a sick child has come in contact with shall be cleaned and sanitized after each use. Individual belongings shall be kept separate.

470 IAC 3-4.5-6(d) Diapering - Diapers. The diapering process shall be done on a table, in a clean and sanitary manner. The diaper changing surface shall be sanitized after each use and materials used for skin cleansing shall be discarded after each use into a tightly covered, easily sanitized container. Individuals responsible for diaper changing shall wash their hands after each diaper change.

IC12-17.2-6-11(a)(2) Immunizations - The parent or guardian of a child shall, when the child is enrolled in a child care ministry, provide the child care ministry with proof that the child has received the required immunizations against the following: Whooping cough.

IC12-17.2-6-14(1) Criminal History Check - The child care ministry must do the following: Conduct a criminal history check of the child care ministries employees and volunteers.

IC12-17.2-6-14(2)(c) Allegation of Child Abuse/Neglect - The child care ministry must do the following: is a person against whom an allegation of child abuse or neglect has been substantiated under IC 31-33.

IC12-17.2-6-7 Enrollment Records - The operator of a child care ministry registered under section 2 of this chapter shall provide a notice to the parent or guardian of a child enrolled in the child care ministry.

The notice must be signed by the parent or guardian when the child is enrolled in the child care ministry and must be kept on file at the child care ministry until two (2) years after the last day the child attends the child care ministry. This notice must be maintained by the child care ministry and made available to the division upon request.

**Ministry CCDF Key Indicator Rules**

IC 12-17.2-3.5-10(b)(1) and (2)  Fire Drills - Each provider shall have monthly documented fire drills including date/time/weather condition/name of person conducting drill/full evacuation time and maintained for previous 12 months.

IC 12-17.2-3.5-6 TB Test - A provider shall have annual intradermal tuberculosis test and result. If medical exempt there must be an annual chest x-ray or a MD statement "free of TB Symptoms".

IC 12-17.2-3.5-8 CPR - Each childcare provider shall have annual certification in Child and Infant CPR. Each childcare provider shall have current certification in First Aid.

IC 12-17.2-3.5-5(a)(2)  Running Water - The childcare facility shall have an approved source of running water from a sink that is in an area where childcare is provided.

IC 12-17.2-3.5-11(a) Hazard Free - A provider shall provide for a safe environment by ensuring that no conditions exist in or on the grounds of the facility where a provider operates a child care program that would endanger the health, safety, or welfare of the children, including ensuring that the following items are placed in areas that are inaccessible to children in the providers care: Fire arms, ammunition and other weapons Location.  Poisons, chemicals, bleach cleaning materials and Medications Location.

IC 12-17.2-3.5-4.1 Child Abuse Registry - Each childcare provider has provided evidence that they have not been named in the State Central Registry IC31-33-18.

IC 12-17.2-3.5-12 Fingerprints - Each childcare provider, household member, employee, volunteer caregiver shall submit fingerprints for a national criminal history background check by the FBI or each childcare provider has local criminal check with documentation that national check is applied for.

IC 12-17.2-3.5-11.1 Immunizations - Each child has age appropriate immunizations including Varicella and Pneumococcal vaccines. Documentation includes: -Attendance records of all children in attendance. -Immunization records for each child (includes month, day and year given for each immunization and childs birth date. or A medical exempt statement from a physician OR a religious belief exemption statement from the parent.

IC 12-17.2-3.5-12.1 No Smoking/Drugs - A childcare provider shall have a written policy prohibiting: -use of tobacco, unintended use of toxic substances, use (homes) of alcohol; use or possession (centers & ministries) of alcohol; and use or possession of illegal substances in the facility where child care is operated when childcare is being provided.

IC 12-17.2-3.5-5.5(a) Supervision - All children in care are continually supervised by a caregiver (must be within sight and sound at all times).

IC 12-17.2-3.5-5.5(b) Infant/Toddler Training - A provider who cares for children who are less than 12 months of age shall complete a training course in safe sleep practices, approved by the Divison. Ensure that all caregivers of children who are less than 12 months of age follow safe sleep practices.

IC 12-17.2-3.5-7(b) Discipline.

IC 12-17.2-3.5-8(b)(3) Child Abuse and Neglect.

IC 12-17.2-3.5-8(b)(4) Orientation.

IC 12-17.2-3.5-5(c)&(d) Transportation.

IC 12-17.2-3.5-5(c) Records.

**LLEP Key Indicator Rules**

IC 12-17.2-3.5-8 CPR Certification - ach childcare provider shall have annual certification in Child and Infant CPR. Each childcare provider shall have current certification in First Aid.

IC 12-17.2-3.5-4.1  State Registry - Each childcare provider has provided evidence that they have not been named in the State Central Registry IC31-33-18.

IC 12-17.2-3.5-12  Finger Prints - Each childcare provider, household member, employee, volunteer caregiver shall submit fingerprints for a national criminal history background check by the FBI or each childcare provider has local criminal check with documentation that national check is applied for.

IC 12-17.2-3.5-12.1 Drug Test - Each childcare provider shall have documentation of a Drug test and result does not show presence of illegal controlled substance(s).(Standard 5 or 8 panel urine test).

IC 12-17.2-3.5-5.5(a)  Supervision - All children in care are continually supervised by a caregiver (must be within sight and sound at all times).

IC 12-17.2-3.5-7(b) Discipline.

IC 12-17.2-3.5-8(b)(3) Child Abuse and Neglect.

IC 12-17.2-3.5-8(c) Records.

IC 12-17.2-3.5-5(e) Daily Activities - Daily activities appropriate to the age, development needs, interests and number of children in the care of the provider.

IC 12-17.2-3.5-6 TB Test - A provider shall have annual intradermal tuberculosis test and result. If medical exempt there must be an annual chest x-ray or a MD statement "free of TB Symptoms".

**The Saskatchewan Key Indicator System: The First Step in Developing a Differential Monitoring Approach**

**Richard Fiene, Ph.D.**

**August 2019**

The purpose of this report is to provide the Ministry of Education in the Province of Saskatchewan with the results of their key indicator study as well as trends in regulatory compliance in the Province as compared to the ECPQIM International Data Base Project. This report will provide a brief introduction and overview to licensing key indicators, overview data, licensing key indicator methodology, and the results from the study depicting the statistics as well as the key indicator rules.

The use of Licensing Key Indicator Rules is to help make an overall monitoring system more efficient and effective through a use of predictive rules/regulations. It is a component system within a differential monitoring approach which targets the types of monitoring visits to programs based upon regulatory compliance history. The other component system deals with weighted risk assessment but this system will not be addressed in this report. The following section of definitions will assist in distinguishing amongst the various systems and methodologies.

**Definitions:**

***Risk Assessment (RA)*** - a differential monitoring approach that employs using only those rules, standards, or regulations that place children at greatest risk of mortality or morbidity if violations/citations occur with the specific rule, standard, or regulation.

***Key Indicators (KI)*** - a differential monitoring approach that employs using only those rules, standards, or regulations that statistically predict overall compliance with all the rules, standards, or regulations. In other words, if a program is 100% in compliance with the Key Indicators the program will also be in substantial to full compliance with all rules, standards, or regulations. The reverse is also true in that if a program is not 100% in compliance with the Key Indicators the program will also have other areas of non-compliance with all the rules, standards, or regulations.

***Differential Monitoring (DM)*** - this is a relatively new approach to determining the number of visits made to programs and what rules, standards, or regulations are reviewed during these visits. There are two measurement tools that drive differential monitoring, one is Weighted Risk Assessment tools and the other is Key Indicator checklists. Weighted Risk Assessments determine how often a program will be visited while Key Indicator checklists determine what rules, standards, or regulations will be reviewed in the program. Differential monitoring is a very powerful approach when Risk Assessment is combined with Key Indicators because a program is reviewed by the most critical rules, standards, or regulations and the most predictive rules, standards, or regulations. See Appendix which presents a ***Logic Model & Algorithm for Differential Monitoring (DMLMA©***)(Fiene, 2012).

***Early Childhood Program Quality Indicator Model (ECPQIM)*** – these are models that employ a key indicator or dashboard approach to program monitoring. Major program monitoring systems in early care and education are integrated conceptually so that the overall early care and education system can be assessed and validated. With these models, it is possible to compare results obtained from licensing systems, quality rating and improvement systems (QRIS), risk assessment systems, key indicator systems, technical assistance, and child development/early learning outcome systems. The various approaches to validation are interposed within this model and the specific expected correlational thresholds that should be observed amongst the key elements of the model are suggested. Key Elements of the model are the following (see Appendix for details): CI = state or federal standards, usually rules or regulations that measure health and safety ***- Caring for Our Children or Head Start Performance Standards*** will be applicable here. PQ = Quality Rating and Improvement Systems (QRIS) standards at the state level; ***ERS (ECERS, ITERS, FDCRS), CLASS, or CDPES*** (Fiene & Nixon, 1985). RA = risk assessment tools/systems in which only the most critical rules/standards are measured. Stepping Stones is an example of this approach. KI = key indicators in which only predictor rules/standards are measured. The ***Thirteen Indicators of Quality Child Care*** is an example of this approach. DM = differential monitoring decision making in which it is determined if a program is in compliance or not and the number of visits/the number of rules/standards are ascertained from a scoring protocol. PD = technical assistance/training and/or professional development system which provides targeted assistance to the program based upon the DM results. CO = child outcomes which assesses how well the children are developing which is the ultimate goal of the system. Please see the Appendices for the ***Logic Model and Algorithm***.

**Overview Regulatory Compliance Data (Please see the Appendices for a graphic display)**

There were 152 child care centers (CCC) used in the analyses and 82 family child care (FDC) homes. There were also 137 CCC rules and 112 FDC rules used in the analyses. The cutoff scores for the high group was 0-1 violations and 7 or more violations for the low group (CCC). The cutoff scores for the high group with FDC was no violations and 6 or more violations for the low group.

The range in rule violations for specific licensing key indicators ranged from 10% to 25% for CCC. For FDC is was from 7% to 19%.

**Licensing Key Indicators**

The cutoff score for the phi coefficient for CCC and FDC was .40 or greater, $p < .0001$. The reason for using these thresholds is that it increases predictability and decreases the chances of false negatives. Please see the following expanded checklist for additional details and placement within the tool.

| ***CCC Rule*** | ***Brief Content*** | ***Phi Coefficient:*** |
|---|---|---|
| **242a** | **Meals** | **.44** |
| **37bi** | **Attendance** | **.64** |
| **37bii** | **Fees** | **.63** |
| **412b** | **Supervisor/Director** | **.45** |
| **422b** | **ECE I** | **.49** |
| **422c** | **ECE II** | **.59** |
| **422d** | **ECE III** | **.51** |
| **431** | **Staff exempt** | **.62** |
| **442ai** | **First aid** | **.48** |
| **442aii** | **CPR** | **.48** |
| **451** | **Criminal Records** | **.42** |
| **47b** | **First aid/CPR** | **.44** |
| **47c** | **Criminal Records** | **.49** |

| *FDC Rule* | *Brief Content* | *Phi Coefficient:* |
|---|---|---|
| **28b** | **Poison Substances** | **.55** |
| **31** | **First aid supplies** | **.46** |
| **32** | **Emergency information** | **.50** |
| **33b** | **First Aid supplies** | **.41** |
| **362bii** | **Emergency contact** | **.41** |
| **362biii** | **Medical Personnel** | **.46** |
| **362d** | **Immunizations** | **.41** |
| **362fii** | **Excursions** | **.50** |
| **362h** | **Agreement** | **.41** |
| **37bi** | **Attendance** | **.50** |
| **37bii** | **Fees** | **.50** |
| **38b** | **Insurances** | **.59** |

**CCC detail from Expanded Checklist – Key Indicators Bold Faced and Highlighted. The full Expanded Checklist is not provided since the Licensing Key Indicators were within a truncated portion of the Checklist:**

**R24. Nutrition**

☐24(1) Provide meals and snacks (include menu posted, children are fed every 3 hours)
Comments:

**☒24(2)(a) Meals and snacks meet nutritional needs**
Comments:

☐24(2)(b) Children are fed in appropriate manner for age and development
Comments:

**R25. Food Services**

☐25(a) Adequate and safe procedures - food handling, preparation, serving and storage
Comments:

☐25(b) Adequate and safe procedures - cleansing utensils
Comments:

**R26. Child with Communicable Disease**

☐26(a) Contact public health officer
Comments:

☐26(b) Recommendations or instructions from public health officer are followed
Comments:

**R27. Medication**

☐27(1)(a) Authorization is acquired
Comments:

☐27(1)(b) Written record of each dose of medication administered

Comments:

☐27(1)(c) All non-emergency medications are stored in a locked enclosure

Comments:

☐27(2) Oral authorization in exceptional circumstances for administering non-prescription (with written confirmation of authorization after)

Comments:

**R28. Hazardous Items**

☐28(a) Unsafe items inaccessible

Comments:

☐28(b) Poisonous substances locked

Comments:

☐28(c) Cover radiator

Comments:

☐28(d) Cap electrical outlets

Comments:

**R29. Telephone, Emergency Numbers**

☐29(a) Telephone in working order

Comments:

☐29(b) Emergency numbers posted

Comments:

**R30. Emergency Evacuation**

☐30 Develop an emergency evacuation plan and practice it monthly

Comments:

**R31. First Aid Supplies**

☐31 Appropriate and sufficient first aid supplies and inaccessible to children

Comments:

**R32. Portable Emergency Information**

☐32 Portable record of emergency information for each child attending

Comments:

**R33. Taking Certain Supplies**

☐33(a) Portable record of emergency information

Comments:

☐33(b) Appropriate and sufficient first aid supplies

Comments:

**R34. Injuries, Unusual Occurrences** *(also discuss child abuse protocol and ensure there is a copy and policies, procedures)*

☐34(a) Immediately notify parent
Comments:
☐34(b) Within 24 hours notify consultant
Comments:
☐34(c) Within seven days complete/submit report
Comments:

**R35. Volunteers**

☐35(1) Child care worker is present at all times when a volunteer is in attendance
Comments:

**R36. Children's Records**

☐36(1)(a) Keep a record for each child
Comments:
☐36(1)(b) Retain the record for a period of six years.
Comments:
☐36(2)(a) Child's name and date of birth (Child's Health Resume & Child's Emergency Information)
Comments:
☐36(2)(b)(i) Names, addresses and phone numbers of the child's parents (Child's Health Resume & Child's Emergency Information)
Comments:
☐36(2)(b)(ii) Names, addresses and phone numbers of person to contact in an emergency (Child's Health Resume & Child's Emergency Information)
Comments:
☐36(2)(b)(iii) Names, addresses and phone numbers of the child's medical practitioner (Child's Health Resume & Child's Emergency Information)
Comments:
☐36(2)(c) Any allergy, illness or other medical condition (Child's Health Resume & Child's Emergency Information)
Comments:
☐36(2)(d) The child's immunization status (Child's Health Resume & Child's Emergency Information)
Comments:
☐36(2)(e) Any medication authorization provided/any record of medication administered (Medication form)
Comments:
☐36(2)(f)(i) Any authorization by the child's parent for an excursion not involving transportation (Excursion form)
Comments:
☐36(2)(f)(ii) Any authorization by the child's parent for an excursion involving transportation (Excursion form)
Comments:
☐36(2)(g) Any report regarding an injury or unusual occurrence (Injury/Unusual Occurrence form & Minor Injury Report)
Comments:

☐36(2)(h) The agreement for services
Comments:

**R37. Attendance Records** (review records for past 12 months)

☐37(a) Complete and accurate monthly child attendance records
Comments:

☒**37(b)(i) Obtain signature of the parent monthly to verify hours/days of the child's attendance**
Comments:

☒**37(b)(ii) Obtain signature of the parent monthly to verify the fees charged**
Comments:

☐37(c) Forward the records to the ministry (Social Service Subsidy) each month
Comments:

**R38. Insurance**

☐38(a) Insurance policy - comprehensive general liability coverage and personal injury coverage
Insurer: Click or tap here to enter text.
Policy Number: Click or tap here to enter text. Expiry date: Click or tap to enter a date.
Comments:

☐38(b) Insurance policy - liability coverage with respect to the transportation of children
If do not transport children, N/A ☐
Insurer: Click or tap here to enter text.
Policy Number: Click or tap here to enter text. Expiry date: Click or tap to enter a date.
Comments:

**R39. Materials to be Made Available**

☐39(a) The Act
Comments:

☐39(b) The regulations
Comments:

☐39(c) Philosophy and program
Comments:

☐39(d) Child management policy
Comments:

☐39(e) Operational policies
Comments:

☐39(f) Fee schedule
Comments:

☐39(g) Any other materials that the Director may require
Identify any other information requested (If none, check N/A ☐):
Comments:

**R40. Confidentiality**

☐40(1)(a)(i) Personal information
Comments:

☐40(1)(a)(ii) Any record with respect to a child or a child's parent
Comments:

☐40(1)(b)(i) Not disclose without parent permission as required for health or safety of the child
Comments:

☐40(1)(b)(i) Not disclose without parent permission as required by law
Comments:

☐40(3)(a) May disclose to a collection agency the name and address of the child's parent

☐40(3)(b) May disclose to a collection agency the amount of fees owing by the parent

☐40(3)(c) May disclose to a collection agency the nature of the fees owing by the parent
Comments:

**Regulations Part IV – Standards for Centres Section**

**R41. Centre Director and Supervisor**

☐41(1)(a) Centre director is appointed and
Comments:

**☒41(1)(b) Supervisor to act in place of the centre director in the centre director's absence**
Comments:

☐41(2)(a) Centre director must be at least 18 years of age
Comments:

☐41(2)(b) Meets or exceeds the qualifications of an ECE III or 41(4)
Comments:

☐41(3)(a) Supervisor must be at least 18 years of age
Comments:

☐41(3)(b) Meets or exceeds qualifications of an ECE I
Comments:

**R42. Child Care Workers**

☐42(1) Child care worker must be at least 16 years of age
Comments:

**☒42(2)(b) If working for 65 hours or more per month meets or exceeds qualifications of an ECE I**
Comments:

**☒42(2)(c) 30% of persons employed in the centre as child care workers for 65 hours or more meet or exceed the qualifications of ECE II**
Comments:

**☒42(2)(d) A further 20% of persons employed in the centre as child care workers for 65 hours or more meet or exceed the qualifications of ECE III**
Comments:

**R43. Exemption**

☒**43(1) May apply for exemption if unable to hire a director or supervisor whose qualifications meet requirements or child care workers whose qualifications meet the requirements**

Comments:

**R44. First Aid and CPR**

☐44(1) At least one person is on the premises who has first aid/CPR during hours of operation

☒**44(2)(a)(i) Each individual employed in the centre for 65 hours or more per month as a centre, director, supervisor or child care worker has completed a first aid course**

Comments:

☒**44(2)(a)(ii) Each individual employed in the centre for 65 hours or more per month as a centre, director, supervisor or child care worker has completed a course in cardiopulmonary resuscitation**

Comments:

☐44(2)(b) When required to do so by the director, retakes a course in (a)

Comments:

**R45. Criminal Record Searches**

☒**45(1) Criminal record check for each centre employee**

Comments:

☐45(2)(a) Establish written policies with respect to criminal record checks

Comments:

☐45(2)(b) Make policies with respect to criminal record checks known to employees/potential employees

Comments:

**R46. Health of Employees**

☐46(4)(a) If employee may have category I or category II communicable disease, the licensee must notify public health

(b) Ensure recommendations/instructions followed.

Comments:

**R47. Employee Records**

☐47(a) Copy of employee's ECE certificates

Comments:

☒**47(b) Proof of first aid/CPR training**

Comments:

☒**47(c) Results of criminal record check (Note to File completed)**

Comments:

☐47(e) Copy of all medical reports for employee

Comments:

**FDC Detail from Expanded Checklist - Key Indicators Bold Faced and Highlighted. The full Expanded Checklist is not provided since the Licensing Key Indicators were within a truncated portion of the Checklist:**

**R28. Hazardous Items**

☐28(a) Unsafe items inaccessible

Comments:

**☒28(b) Poisonous substances locked**

Comments:

☐28(c) Cover radiator

Comments:

☐28(d) Cap electrical outlets

Comments:

**R29. Telephone, Emergency Numbers**

☐29(a) Telephone in working order

Comments:

☐29(b) Emergency numbers posted

Comments:

**R30. Emergency Evacuation**

☐30 Develop an emergency evacuation plan and practice it monthly

Comments:

**R31. First Aid Supplies**

**☒31 Appropriate and sufficient first aid supplies and inaccessible to children**

Comments:

**R32. Portable Emergency Information**

**☒32 Portable record of emergency information for each child attending**

Comments:

**R33. Taking Certain Supplies**

☐33(a) Portable record of emergency information

Comments:

**☒33(b) Appropriate and sufficient first aid supplies**

Comments:

**R34. Injuries, Unusual Occurrences** *(also discuss child abuse protocol and ensure there is a copy and policies, procedures)*

☐34(a) Immediately notify parent
Comments:
☐34(b) Within 24 hours notify consultant
Comments:
☐34(c) Within seven days complete/submit report
Comments:

**R35. Volunteers**

☐35(2) The licensee, alternate or, assistant (GF) is present when a volunteer is in attendance
Comments:

**R36. Children's Records**

☐36(1)(a) Keep a record for each child
Comments:
☐36(1)(b) Retain the record for a period of six years.
Comments:
☐36(2)(a) Child's name and date of birth (Child's Health Resume & Child's Emergency Information)
Comments:
☐36(2)(b)(i) Names, addresses and phone numbers of the child's parents (Child's Health Resume & Child's Emergency Information)
Comments:
**☒36(2)(b)(ii) Names, addresses and phone numbers of person to contact in an emergency (Child's Health Resume & Child's Emergency Information)**
Comments:
**☒36(2)(b)(iii) Names, addresses and phone numbers of the child's medical practitioner (Child's Health Resume & Child's Emergency Information)**
Comments:
☐36(2)(c) Any allergy, illness or other medical condition (Child's Health Resume & Child's Emergency Information)
Comments:
**☒36(2)(d) The child's immunization status (Child's Health Resume & Child's Emergency Information)**
Comments:
☐36(2)(e) Any medication authorization provided/any record of medication administered (Medication form)
Comments:
☐36(2)(f)(i) Any authorization by the child's parent for an excursion not involving transportation (Excursion form)
Comments:
**☒36(2)(f)(ii) Any authorization by the child's parent for an excursion involving transportation (Excursion form)**
Comments:
☐36(2)(g) Any report regarding an injury or unusual occurrence (Injury/Unusual Occurrence form & Minor Injury Report)

Comments:

☒**36(2)(h) The agreement for services**

Comments:

**R37. Attendance Records** (review records for past 12 months)

☐37(a) Complete and accurate monthly child attendance records

Comments:

☒**37(b)(i) Obtain signature of the parent monthly to verify hours/days of the child's attendance**

Comments:

☒**37(b)(ii) Obtain signature of the parent monthly to verify the fees charged**

Comments:

☐37(c) Forward the records to the ministry (Social Service Subsidy) each month

Comments:

**R38. Insurance**

☐38(a) Insurance policy - comprehensive general liability coverage and personal injury coverage

Insurer: Click or tap here to enter text.

Policy Number: Click or tap here to enter text. Expiry date: Click or tap to enter a date.

Comments:

☒**38(b) Insurance policy - liability coverage with respect to the transportation of children**

**If do not transport children, N/A** ☐

Insurer: Click or tap here to enter text.

Policy Number: Click or tap here to enter text. Expiry date: Click or tap to enter a date.

Comments:

**Conclusion:**

The CCC and FDC key indicators represent approximately 10% of all the rules and regulations for their respective service type which is typical of the percentage of rules selected as key indicators. With these particular rules, they are not based upon risk but upon predictability in that these licensing rules statistically predict overall regulatory compliance. There is some overlap with the ***Fiene Thirteen Key Indicators*** and the ***International ECPQIM data base***, such as with Immunizations, First Aid, CPR, Criminal Records Check, and Staff Qualifications.

## APPENDICES

### Theory of Regulatory Compliance Algorithm (Fiene KIS Algorithm)

1) $\Sigma R = C$
2) Review C history x 3 yrs
3) NC + C = CI
4) If CI = 100 -> KI
5) If KI > 0 -> CI or if C < 100 -> CI
6) If RA (NC% > 0) -> CI
7) KI + RA = DM
8) KI = ((A)(D)) - ((B)(E)) / sqrt ((W)(X)(Y)(Z))
9) RA = ΣR1 + ΣR2 + ΣR3 + ….. ΣRn / N
10) (TRC = 99%) + (ϕ = 100%)
11) (CI < 100) + (CIPQ = 100) -> KI (10% CI) + RA (10-20% CI) + KIQP (5-10% of CIPQ) -> OU

***Legend:***

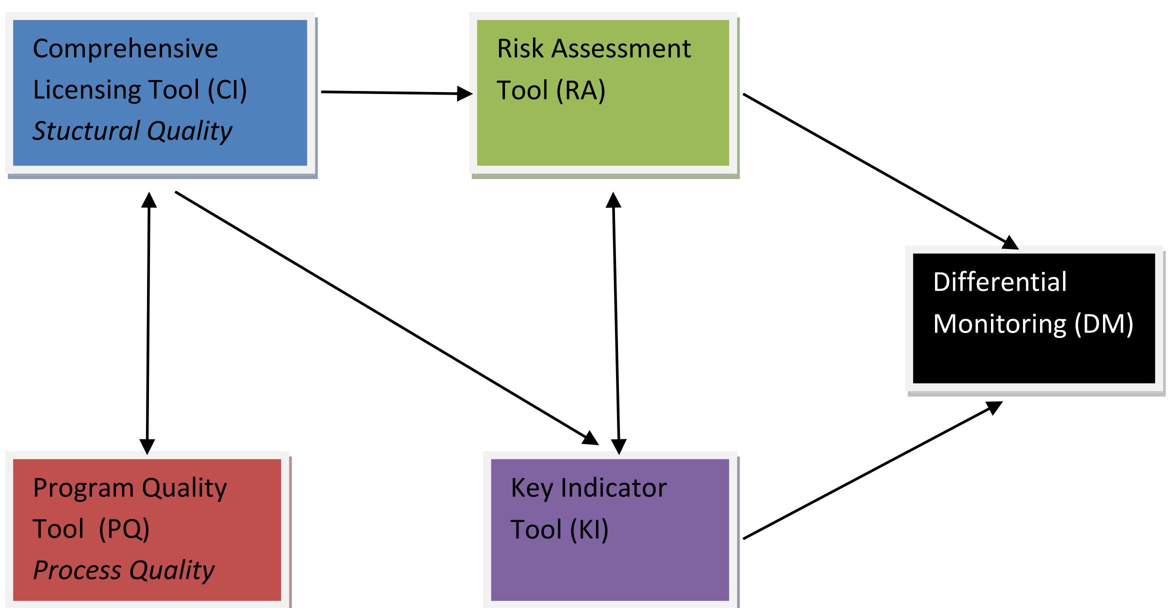
R = Rules/Regulations/Standards
C = Compliance with Rules/Regulations/Standards
NC = Non-Compliance with Rules/Regulations/Standards
CI = Comprehensive Instrument for determining Compliance
ϕ = Null
KI = Key Indicators; KI >= .26+ Include; KI <= .25 Null, do not include
RA = Risk Assessment
ΣR1 = Specific Rule on Likert Risk Assessment Scale (1-8; 1 = low risk, 8 = high risk)
N = Number of Stakeholders
DM = Differential Monitoring
TRC = Theory of Regulatory Compliance
CIPQ = Comprehensive Instrument Program Quality
KIPQ = Key Indicators Program Quality
OU = Outcomes
A = High Group + Programs in Compliance on Specific Compliance Measure (R1...Rn).
B = High Group + Programs out of Compliance on Specific Compliance Measure (R1...Rn).
E= Low Group + Programs in Compliance on Specific Compliance Measure (R1...Rn).
D = Low Group + Programs out of Compliance on Specific Compliance Measure (R1...Rn).
W = Total Number of Programs in Compliance on Specific Compliance Measure (R1...Rn).
X = Total Number of Programs out of Compliance on Specific Compliance Measure (R1...Rn).
Y = Total Number of Programs in High Group (ΣR = 98+).
Z = Total Number of Programs in Low Group (ΣR <= 97).
High Group = Top 25% of Programs in Compliance with all Compliance Measures (ΣR).
Low Group = Bottom 25% of Programs in Compliance with all Compliance Measures (ΣR).

# DIFFERENTIAL MONITORING LOGIC MODEL & ALGORITHM (DMLMA©) (Fiene, 2012): A 4th Generation ECPQIM – Early Childhood Program Quality Indicator Model

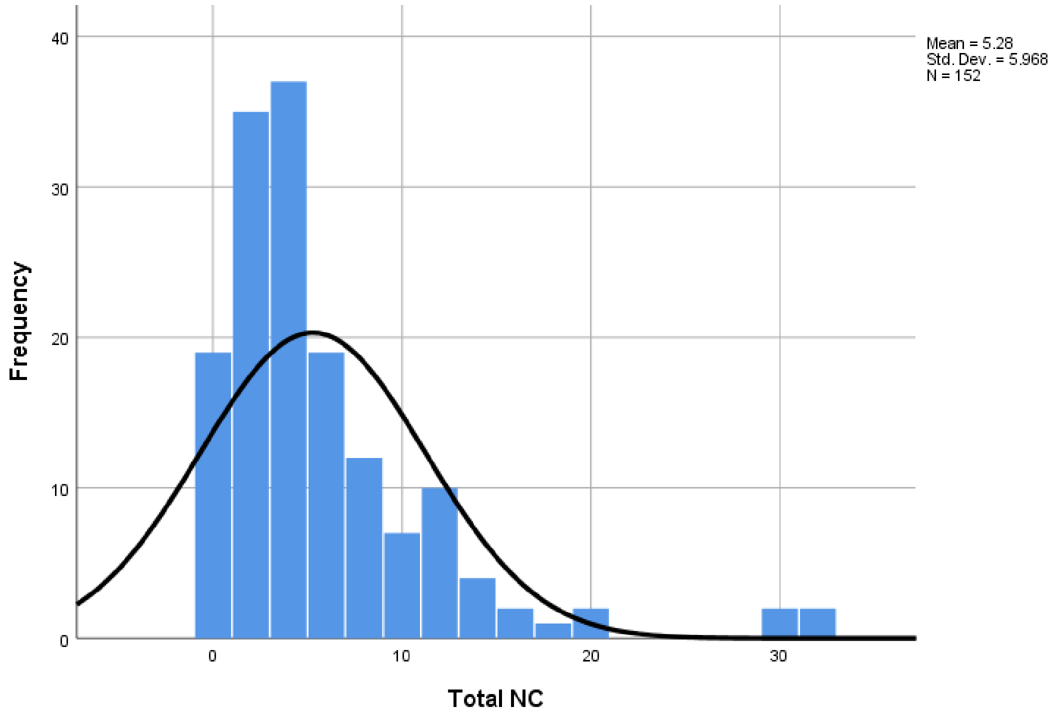
## CI x PQ => RA + KI => DM + PD => CO

Definitions of Key Elements:

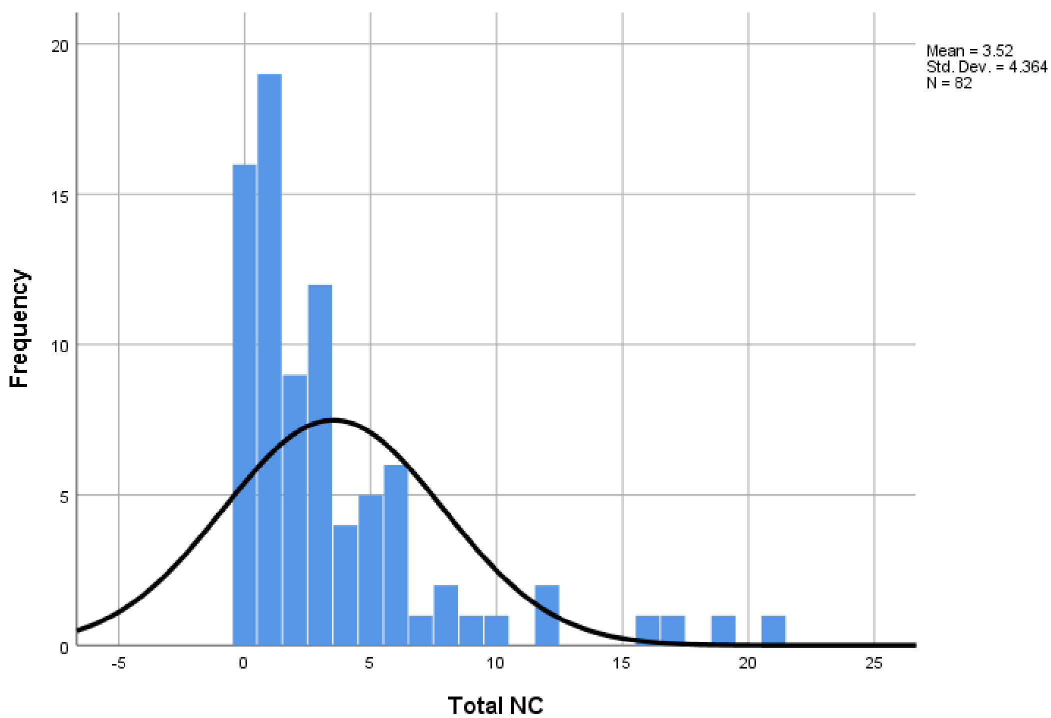
CI = Comprehensive Licensing Tool (Health and Safety)(***Caring for Our Children***)
PQ ***= ECERS-R, FDCRS-R, CLASS, CDPES*** (Caregiver/Child Interactions/Classroom Environment)
RA = Risk Assessment, (High Risk Rules)(***Stepping Stones***)
KI = Key Indicators (Predictor Rules***)(13 Key Indicators of Quality Child Care***)
DM = Differential Monitoring, (How often to visit and what to review)
PD = Professional Development/Technical Assistance/Training
CO = Child Outcomes (See Next Slide for PD and CO Key Elements)



**Centers Total Number of Violations**




**Homes Total Number of Violations**



**The ITERS-3: Report on a Pre-Test Data Collection for an Online Coaching Intervention**

**Richard Fiene, Ph.D.**

**July 2018**

The purpose of this brief report is to describe the pre-test data collection efforts of an online coaching intervention through the Better Kid Care Program funded by the William Penn Foundation; as well as providing descriptive and demographic analyses of the Infant Toddler Environmental Rating Scale, Version 3 (ITERS-3). As with any intervention study, it is paramount that one establishes equivalency between the intervention and comparison groups but usually there is always some very interesting descriptive and demographic trends that appear in the data. In this case because the ITERS-3 is so new, it is equally interesting to report on some very basic descriptive statistics drawn from this pilot study so that other researchers can compare their respective samples with this sample.

METHODS

The focus of this study was in and around the Philadelphia area in Pennsylvania focusing on infant and toddler classrooms. There were 47 programs with 24 intervention classrooms and 23 comparison classrooms. Three observers collected the ITERS-3 data on the 47 classrooms. Basic demographic information was collected on each of the classrooms, their programs, teachers and directors, such as: profit/non-profit status, QRIS Star level, years of experience, years at present location, educational level of director, etc.

RESULTS

The most salient result was the analyses between the intervention and comparison groups. There were no statistically significant differences between the two groups on the ITERS-3. The overall ITERS-3 scores were 3.47 for the intervention group and 3.29 for the comparison group. Also, there were no statistically significant differences amongst the three assessors collecting the ITERS-3 data (ranged from 3.13 to 3.68). All sub-scales and items within the ITERS-3 were non-significant.

| ITERS-3 Sub-Scale | Intervention Group | Comparison Group |
|---|---|---|
| **Space and Furnishings** | 3.66 | 3.14 |
| **Personal Care Routines** | 2.83 | 2.68 |
| **Language and Books** | 3.93 | 3.80 |
| **Activities** | 3.12 | 2.76 |
| **Interaction** | 3.99 | 3.99 |
| **Program Structure** | 3.29 | 3.22 |

Since there were no significant differences between the intervention and comparison groups the data from both were combined and used for all the following demographic and descriptive analyses (n = 47). As stated in the Methods section above, several demographic variables were collected on the classrooms, programs, teachers, and directors. These results are reported here with some very interesting trends in the data.

There was a significant relationship between ITERS-3 and the Keystone Stars level ($r = .31$; $p < .04$). There were significant relationships between profit vs non-profit status with the following: years in the location (-.63; $p < .0001$) and star level ($r = -.33$; $p < .03$) favoring non-profit status. There were statistically significant differences between star levels 3 and 4 (3.20 vs 3.76 respectively)($F = 4.71$; $p < .04$); and a trend for non-profit programs to score higher on the ITERS-3 (3.59) versus profit programs (3.17).

DISCUSSION

The purpose of this report was to provide basic descriptive and demographic analyses from a pre-test data collection effort involving an online coaching model. The pre-test analyses equivalency testing was within acceptable ranges when comparing the intervention group and comparison groups on t-tests and One-way ANOVA's.

Once this equivalency was established, the additional analyses involving the demographic variables in seeing if any relationships existed amongst these variables proved to be productive. The level of the quality star QRIS had a positive impact on ITERS-3 scores. Profit vs non-profit status also had a positive impact on ITERS-3 scores favoring the non-profits. These results should not be surprising given previous research completed both within Pennsylvania and beyond.

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**Penn State's Better Kid Care Online Coaching Intervention Final Report**

**Richard Fiene, Ph.D.**

**September 2019**

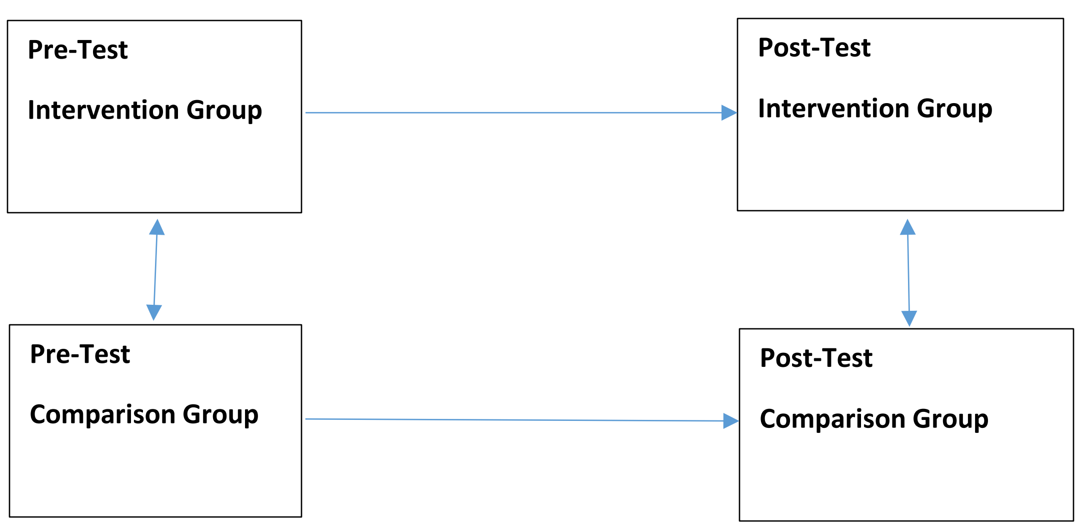
The purpose of this report is to describe the efforts of an online coaching intervention through the Better Kid Care Program funded by the William Penn Foundation; as well as providing descriptive and demographic analyses of the Infant Toddler Environmental Rating Scale, Version 3 (ITERS-3). As with any intervention study, it is paramount that one establishes equivalency between the intervention and comparison groups but usually there is always some very interesting descriptive and demographic trends that appear in the data. In this case because the ITERS-3 is so new, it is equally interesting to report on some very basic descriptive statistics drawn from this study so that other researchers can compare their respective samples with this sample.

Several interesting footnotes need to be made to better understand the results of this study. Although the programs were randomly assigned to either the intervention group or the comparison group, all the programs that participated in this study were high performing programs as measured by the Pennsylvania Quality Rating and Improvement System Keystone Stars. They were all at either a Star 3 or 4 level which is indicative of a high performing early care and education program.

**LOGIC MODEL FOR ANALYTICS**

Figure 1 provides the logic model for the analytics for the study. It is a classic random clinical trial with an intervention group (online coaching) with a comparison group. Paired t-tests for the intervention group classrooms and comparison group classrooms were completed from pre- to post-tests. Independent t-tests were completed comparing the intervention group to the comparison group in both the pre- and post-tests.

<u>**Figure 1:**</u>



**METHODS**

The focus of this study was in and around the Philadelphia area in Pennsylvania focusing on infant and toddler classrooms. There were 47 programs with 24 intervention classrooms and 23 comparison classrooms which began the project. Three observers collected the ITERS-3 data on the 47 classrooms. Basic demographic information was collected on each of the classrooms, their programs, teachers and directors, such as: profit/non-profit status, QRIS Star level, years of experience, years at present location, educational level of director, etc. Also, a coaching log was kept on each of the coaches in the study. There were 8 coaches in total. Data within the coaching log kept track of the observations made, the length of the coaching session, what was covered, and where it was conducted.

By the end of the intervention nine months later, there were 36 programs with 13 intervention classrooms and 23 comparison classrooms. It is unfortunate with the loss of the intervention classrooms (this will be discussed in the Limitations Section), but not unusual for this type of research.

**RESULTS**

The most salient result was the analyses between the intervention and comparison groups. There were no statistically significant differences between the two groups on the ITERS-3. The overall ITERS-3 scores on the pre-test were 3.47 for the intervention group and 3.29 for the comparison group; and 4.58 and 4.37 respectively for the intervention and comparison groups on the post-test. Also, there were no statistically significant differences amongst the three assessors collecting the ITERS-3 data on either the pre- or post-tests. All sub-scales and items within the ITERS-3 were non-significant on the pre-test and post-test. However, the paired t-tests did show significant differences for both the intervention and comparison groups.

**Chart 1 – Pre-Test Scores on the ITERS-3**

| ITERS-3 Sub-Scales | Intervention Group | Comparison Group |
|---|---|---|
| **Space and Furnishings** | 3.66 | 3.14 |
| **Personal Care Routines** | 2.83 | 2.68 |
| **Language and Books** | 3.93 | 3.80 |
| **Activities** | 3.12 | 2.76 |
| **Interaction** | 3.99 | 3.99 |
| **Program Structure** | 3.29 | 3.22 |

**Chart 2 – Post Test Scores on the ITERS-3**

| ITERS-3 Sub-Scales | Intervention Group | Comparison Group |
|---|---|---|
| **Space and Furnishings** | 4.85* | 3.64 |
| **Personal Care Routines** | 4.35* | 3.81* |
| **Language and Books** | 4.97* | 4.87* |

| | | |
|---|---|---|
| **Activities** | 3.94 | 3.93 |
| **Interaction** | 5.13* | 5.19* |
| **Program Structure** | 4.65* | 4.83* |

On the paired pre- to post-test comparisons it is evident that both the intervention and comparison groups increased in both cases with the intervention group increasing slightly better than the comparison group in that 5 versus 4 sub-scales were statistically significant.

Since there were no significant differences between the intervention and comparison groups at the pre-test, the data from both were combined and used for all the following demographic and descriptive analyses (n = 47). As stated in the Methods section above, several demographic variables were collected on the classrooms, programs, teachers, and directors. These results are reported here with some very interesting trends in the data.

There was a significant relationship between ITERS-3 and the Keystone Stars level ($r = .31$; $p < .04$). There were significant relationships between profit vs non-profit status with the following: years in the location (-.63; $p < .0001$) and star level ($r = -.33$; $p < .03$) favoring non-profit status. There were statistically significant differences between star levels 3 and 4 (3.20 vs 3.76 respectively)($F = 4.71$; $p < .04$); and a trend for non-profit programs to score higher on the ITERS-3 (3.59) versus profit programs (3.17).

These same analyses were conducted on the post-test sample (n=36). Here are the same results for the post-test. There was not a significant relationship between ITERS-3 and the Keystone Stars level (level 3 = 4.88 and level 4 = 4.20). There were significant relationships between profit vs non-profit status with the following: years in the location (-.56; $p < .001$) favoring non-profit status. There were no statistically significant differences between star levels 3 and 4 (4.88 vs 4.20 respectively); and a trend for non-profit programs to score higher on the ITERS-3 (4.71) versus profit programs (4.31).

**DISCUSSION**

The purpose of this report was to provide an overview to the effectiveness of the online coaching program as implemented by the Better Kid Care Project, provide basic descriptive and demographic analyses from a pre-test data collection effort, and provide information about the coaching intervention in particular. The pre-test analyses equivalency testing was within acceptable ranges when comparing the intervention group and comparison groups on t-tests and One-way ANOVA's.

Once this equivalency was established, the additional analyses involving the demographic variables in seeing if any relationships existed amongst these variables proved to be productive. The level of the quality star QRIS had a positive impact on ITERS-3 scores. Profit vs non-profit status also had a positive impact on ITERS-3 scores favoring the non-profits. These results should not be surprising given previous research completed both within Pennsylvania and beyond.

Post-test analyses demonstrated that both the intervention and comparison groups increased on the ITERS-3 by the same amount. Actually this was not un-expected because the comparison group received the Better Kid Care online modules which is, in itself, an innovative training delivery system short of actual online coaching. However, it is possible to say that the online coaching intervention did help to increase overall quality slightly better than just taking the online modules.

Coaching analyses which will look at the focus of coaching, the time, the location, and if observations were done with the coaching prior to the coaching. The focus here is just on the intervention classrooms because that is where the coaching occurred.

**LIMITATIONS**

Sample size would have been sufficient but with the loss of almost 50% of the intervention classrooms, sample size became an issue. With a more sufficient sample size, based on the trends in the data, levels of significance would have been attained.

We don't have a good explanation of why the intervention classrooms dropped out at such a significant rate other than this was an intensive intervention and took a great deal of time.

All programs were high performing programs, STAR 3 or 4, and the comparison group was able to take Better Kid Care online modules which was a good thing. However, statistically it appears that we started out at a much higher ITERS-3 score level than what would have been generally expected which left less variance in the data for improvement. Both the intervention and comparison groups increased at about the same rate from pre to post-test. It would have been interesting to have a third group which did not get the online coaching nor the online modules offered by the Better Kid Care project but just the run of the mill type of training offered in the Pennsylvania training system.

**FUTURE RESEARCH**

For future research, the online coaching intervention needs to be utilized with lower performing programs, more at a Star 1 and 2 levels.

The Better Kid Care Online Coaching needs to utilize full-time coaches rather than in-house coaches which was utilized in this study.

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**The Basic Tenets of an Effective and Efficient Monitoring System for Regulatory Compliance**

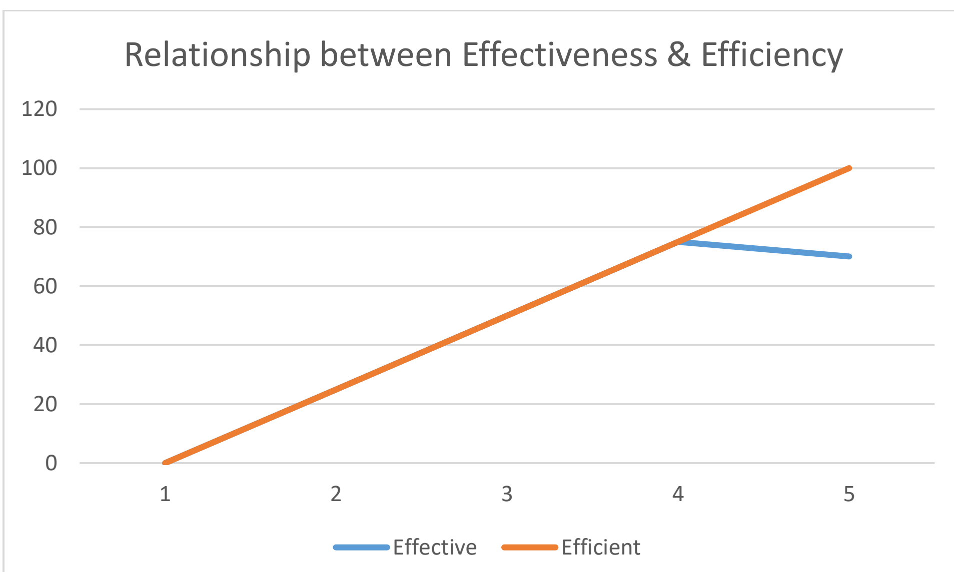
**Richard Fiene, PhD.**

**April 2018**

This paper will describe the essential elements of building an effective and efficient monitoring system for regulatory compliance. There is a balancing of both effectiveness and efficiency that need to be conjoined as state administrators think about how best to monitor human services. A basic assumption of this paper is that effectiveness and efficiency are tied together in a deep structure and are not two independent values.

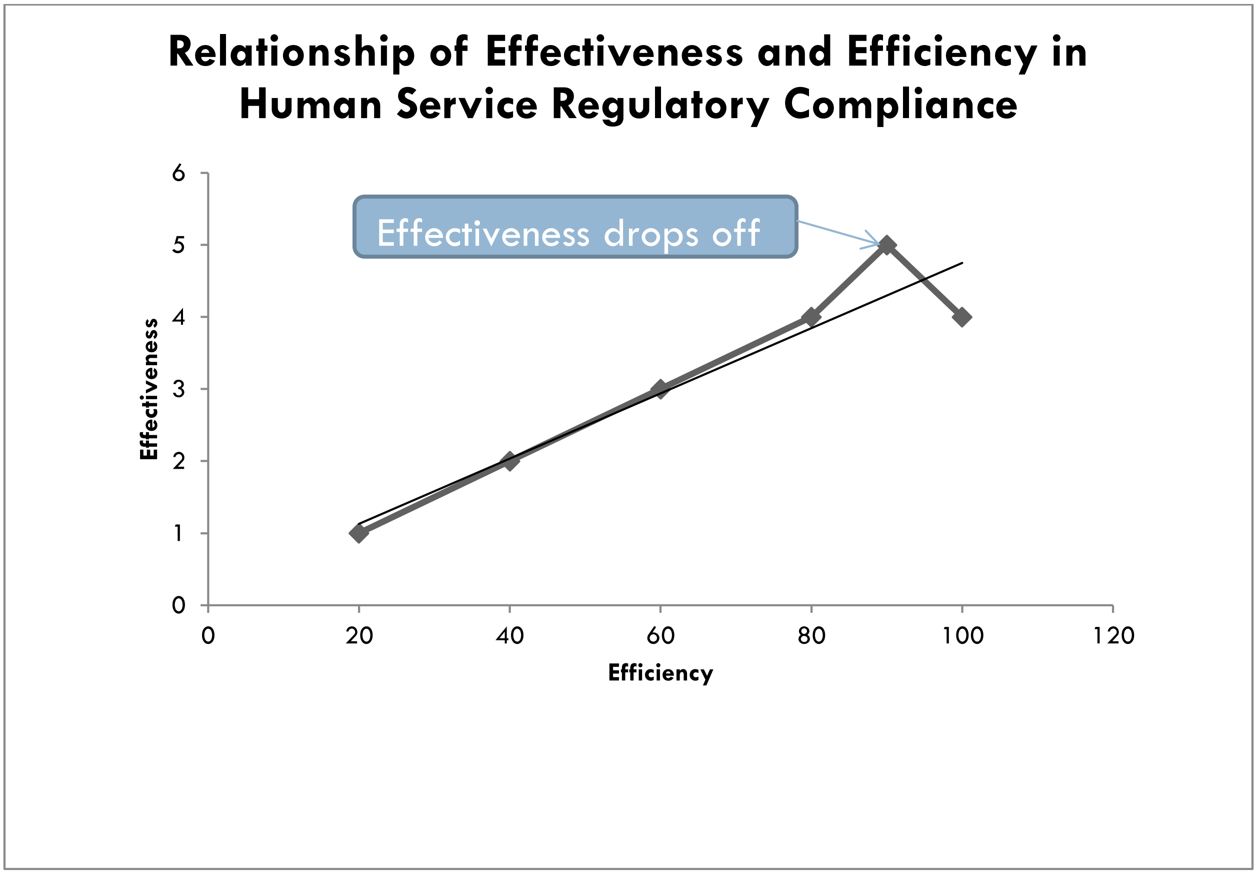
The prevailing theory of the relationship of effective and efficient monitoring systems is based upon a linear relationship between the two. The best monitoring system is one that is both effective and efficient. And this is true up to a point. An alternate theory or paradigm for thinking about this relationship is that as one moves up the efficiency scale, effectiveness will begin to slide as we move from highly efficient systems to the most efficient systems where very few rules are reviewed (see the below figure 1 for a depiction of this relationship). Within the human service regulatory administration and compliance field is the move to more abbreviated inspections in which fewer rules are reviewed. These abbreviated inspections are based upon risk assessment and key indicator methodologies.

**Figure 1 – The NonLinear Relationship between Effectiveness and Efficiency**



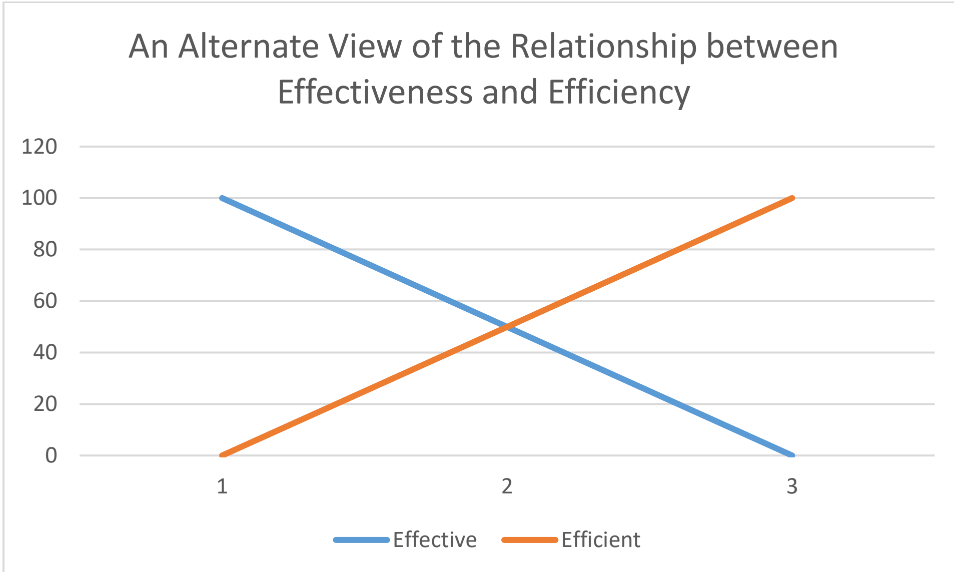

As state administrators of regulatory compliance systems there is the need to find the "sweet spot", the balance between having both an effective and efficient monitoring system. Finding the correct number of rules to monitor is a difficult decision.  Especially in the present focus on de-regulation.  We need to be careful to "not throw the baby out with the bath water", so to speak, in public policy terms.   The above relationship as depicted in Figure 1 has been discovered in repeated studies by the author in all forms of human service licensing and regulatory administration and compliance studies, such as child residential , adult residential, and early care and education (see Figure 2 below).

**Figure 2 – Study Results from Several Human Service Regulatory Administration & Compliance Studies**




An alternate way of looking at effectiveness and efficiency is depicted in Figure 3 below.  In this depiction, both values are placed within the same graphic in order to determine how they interact with each other.  The key to this Intersection of Effectiveness and Efficiency is determining the balance point where one can find the most effective and efficient monitoring system.  For state administrators responsible for regulatory administration, it is always difficult to find the correct balance of oversight in a system that is operated with limited resources.  There is always pressure to make the most out of limited resources.  But with that said, everyone needs to be certain that in the quest for efficiencies we do not really begin to jeopardize effectiveness.

**Figure 3 – The Intersection of Effectiveness and Efficiency**




The purpose of this paper is to demonstrate an alternate paradigm in thinking about the relationship between effectiveness and efficiency as it relates to program monitoring within a regulatory administration and compliance setting. What are some of the key tenets in deciding upon a monitoring system that will meet the needs of all clients who are receiving various human services without jeopardizing their overall health and safety which is the essence of effectiveness.

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**Three Things We Have Learned about Key Indicators, Risk Assessments, and Differential Monitoring**

**Richard Fiene, Ph.D.**

**April 2018**

After 40+ years of research regarding the Key indicator, Risk Assessment and Differential Monitoring methodologies in human service regulatory administration, there are certain consistencies that have been noted over the years. I have highlighted some of these in Technical Research Notes (please see http://RIKInstitute.com) in the past but there are three that I feel are so significant that I wanted to review them here together.

One, in creating the data base for Key Indicators, the best model for sorting the program licensing scores is to compare the top 25% to the bottom 25% while eliminating the middle 50% of the programs that fall within this range. Some states have used the top 50% and the bottom 50% as the sorting schema. In making comparisons utilizing the various data sorting models, the 25%/25% model always performed the best.

Two, in most studies that involved both program compliance data and program quality data, Key indicator and Risk Assessment Rules correlated significantly with ERS and CLASS scores. This is an important finding because one of the reasons for doing abbreviated monitoring inspections such as Key Indicator or Risk Assessment Reviews is to establish a balance between program compliance as measured via licensing and program quality as measured via ERS or CLASS usually within a QRIS protocol.

Three, there appears to be little to no significance to the number of rules within a Key Indicator Tool. It performs well with fewer than 10 rules as well as in cases where there are more rules present in the tool. It is more important what the Key Indicator Rules are than the number. However, with that said, obviously the more rules one has the less efficient the process becomes because you are reviewing more rules than may be warranted.

I thought it important to share these three short thoughts with you regarding the trends I have noticed over the past 40+ years of doing research into Key Indicator, Risk Assessment and Differential Monitoring within human services and early care and education regulatory compliance, licensing, program quality and professional development systems.

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**Regulatory Compliance Decision Making Using the Key Indicator Methodology**

**Richard Fiene, Ph.D.**

**April 2018**

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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**The Implications in Regulatory Compliance Measurement When Moving from Nominal to Ordinal Scaling**

**Richard Fiene, Ph.D.**

**May 2018**

The purpose of this paper is to provide an alternate paradigm for regulatory compliance measurement in moving from a nominal to an ordinal scale measurement strategy. Regulatory compliance measurement is dominated by a nominal scale measurement system in which rules are either in compliance or out of compliance. There are no gradients for measurement within the present licensing measurement paradigm. It is very absolute. Either a rule is in full compliance to the letter of the law or the essence of the regulation or it is not. An alternate paradigm borrowing from accreditation and other program quality systems is to establish an ordinal scale measurement system which takes various gradients of compliance into account. With this alternate paradigm, it offers an opportunity to begin to introduce a quality element into the measurement schema. It also allows to take into consideration both risk and prevalence data which are important in rank ordering specific rules.

So how would this look from a licensing decision making vantage point. Presently, in licensing measurement, licensing decisions are made at the rule level in which each rule is either in or out of compliance in the prevailing paradigm. Licensing summaries with corrective actions are generated from the regulatory compliance review. It is a nominal measurement system being based upon Yes/No responses. The alternate measurement paradigm I am suggesting in this paper is one that is more ordinal in nature where we expand the Yes/No response to include gradients of the particular rule. In the next paragraph, I provide an example of a rule that could be measured in moving from a nominal to ordinal scale measurement schema.

Rather than only measuring a rule in an all or none fashion, this alternate paradigm provides a more relative mode of measurement at an ordinal level. For example, with a professional development or training rule in a particular state which requires, let’s say, 6 hours of training for each staff person. Rather than having this only be 6 hours in compliance and anything less than this is out of compliance, let’s have this rule be on a relative gradient in which any amount of hours above the 6 hours falls into a program quality level and anything less than the 6 hours falls out of compliance but at a more severe level depending on how far below the 6 hours and how many staff do not meet the requirement (prevalence). Also throw in a specific weight which adds in a risk factor and we have a paradigm that is more relative rather than absolute in nature.

From a math modeling perspective, the 1 or 0 format for a Yes or No response becomes -2, -1, 0, +1, +2 format. This is more similar to what is used in accreditation systems where 0 equals Compliance and -1 and -2 equals various levels of Non-Compliance in terms of severity and/or prevalence. The +1 and +2 levels equal value added to the Compliance level by introducing a Quality Indicator. This new formatting builds upon the compliance vs non-compliance dichotomy (C/NC) but now adds a quality indicator (QI) element. By adding this quality element, we may be able to eliminate or at least lessen the non-linear relationship between regulatory compliance with rules and program quality scores as measured by the

Environmental Rating Scales (ERS) and CLASS which is the essence of the Theory of Regulatory Compliance (TRC). It could potentially make this a more linear relationship by not having the data as skewed as it has been in the past.

By employing this alternate paradigm, it is a first demonstration of the use of the Key Indicator Methodology in both licensing and quality domains. The Key Indicator Methodology has been utilized a great deal in licensing but in few instances in the program quality domain. For example, over the past five years, I have worked with approximately 10 states in designing Licensing Key Indicators but only one state with Quality Key Indicators from their QRIS – Quality Rating and Improvement System. This new paradigm would combine the use in both. It also takes advantage of the full ECPQI2M – Early Childhood Program Quality Improvement and Indicator Model by blending regulatory compliance with program quality standards.

A major implication in moving from a nominal to an ordinal regulatory compliance measurement system is that it presents the possibility of combining licensing and quality rating and improvement systems into one system via the Key Indicator Methodology. By having licensing indicators and now quality indicators that could be both measured by licensing inspectors, there would be no need to have two separate systems but rather one that applies to everyone and becomes mandated rather than voluntary. It could help to balance both effectiveness and efficiency by only including those standards and rules that statistically predict regulatory compliance and quality and balancing risk assessment by adding high risk rules.

I will continue to develop this scale measurement paradigm shift in future papers but wanted to get this idea out to the regulatory administration field for consideration and debate. This will be a very controversial proposal since state regulatory agencies have spent a great deal of resources on developing free standing QRIS which build upon licensing systems. This alternate paradigm builds off my Theory of Regulatory Compliance's key element of relative vs absolute measurement and linear vs non-linear relationships. Look for additional information about this on my website RIKI Institute Blog - https://rikinstitute.com/blog/.

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# Regulatory Compliance Skewness

Richard Fiene, Ph.D.

June 2018

In dealing with regulatory compliance data distributions, one is always impressed with the skewness of the data distribution. This is a major disadvantage of working with these data distributions because it eliminates utilizing parametric statistics. These short comings have been dealt with in the past by using non-parametric statistics, the dichotomization of data distributions, moving from a nominal to ordinal scaling, and risk assessment/weighting. These adjustments have been successful in helping to analyze the data but are not ideal and will never approach a normally distributed curve. However, that is not the intent of regulatory compliance data, the data distribution should demonstrate a good deal of skewness because these data are demonstrating protections for clients and not quality services. One would not want the data to be normally distributed.

This short paper/technical research note delineates the state of the art with an international regulatory compliance data base that has been created over the past 40 years at the Research Institute for Key Indicators (RIKILLC). In it, I provide basic descriptive statistics to demonstrate to other researchers the nature of the data distributions so that they can be aware of the shortcomings of the data when it comes to statistical analyses. I have employed various scaling methods to help with the skewness of the data but it still does not approximate normally distributed data. This will be self-evident in the data displays.

| | KI | PQ | RC | PQ 1-5 | RC 1-5 |
|---|---|---|---|---|---|
| **Mean** | **1.68** | **3.42** | **5.51** | **2.96** | **3.48** |
| **SD** | **1.61** | **0.86** | **5.26** | **0.90** | **1.43** |
| **Sum** | **175** | **348** | **573** | **302** | **362** |
| **Variance** | **3.61** | **0.74** | **27.63** | **0.81** | **2.06** |
| **Range** | **6.00** | **4.11** | **25.00** | **4.00** | **4.00** |
| **Minimum** | **0** | **1.86** | **0** | **1.00** | **1.00** |
| **Maximum** | **6.00** | **5.97** | **25.00** | **5.00** | **5.00** |
| **SE Mean** | **0.16** | **0.09** | **0.52** | **0.09** | **0.14** |
| **Kurtosis** | **0.073** | **-0.134** | **2.112** | **-0.388** | **-1.097** |
| **Skewness** | **0.898** | **0.467** | **1.468** | **0.327** | **-0.494** |

***Legend:***

***KI = Key Indicators***

***PQ = Program Quality (ERS Scale)***

***RC = Regulatory Compliance (State Comprehensive Review Checklist)***

***PQ 1-5 = Program Quality using 1-5 scale***

***RC 1-5 = Regulatory Compliance using 1-5 scale (1 = Low RC; 2-4 = Med Level RC; 5 = High/Substantial RC)***

***Richard Fiene, Ph.D., Research Psychologist, Research Institute for Key Indicators (RIKILLC); Professor of Psychology (ret), Penn State University; Senior Research Consultant, National Association for Regulatory Administration (NARA)***

# Regulatory Compliance Scaling for Decision Making

**Richard Fiene, Ph.D.**

**June 2018**

There is a lack of empirical demonstrations of regulatory compliance decision making. In the past, I have used the methodologies of key indicators, risk assessment and the resultant differential monitoring techniques of how often and what should be reviewed for decision making. What has not been addressed is decision making based upon comprehensive reviews when all regulations are assessed. This short paper will address how empirical evidence taken from the past 40+ years of establishing and researching a national data base for regulatory compliance can help lead us to a new scaling of regulatory compliance decision making.

In analyzing regulatory compliance data it becomes perfectly clear that the data have very little variance and are terribly skewed in which the majority of programs are in either full or substantial compliance with all the respective regulations. Only a small handful of programs fall in the category of being in low compliance with all the regulations.

The proposed scaling has three major decision points attached to regulatory compliance scores. Either programs are in full or substantial compliance, in low compliance or somewhere in the middle. Full or substantial regulatory compliance is 100% or 99-98% in regulatory compliance. Low regulatory compliance is less than 90% and mid-regulatory compliance is between 97%-90%. These ranges may seem exceptionally tight but based upon the national data base on regulatory compliance that I maintain at the Research Institute for Key Indicators (RIKILLC) these are the ranges that have formed over the past 40 years. These data ranges should not come as a surprise because we are talking about regulatory compliance with health and safety standards. These are not quality standards, these are basic protections for clients. The data are not normally distributed, not even close as is found in quality tools and standards.

What would a **Regulatory Compliance Decision-Making Scale** look like:

| Data | Level | Decision |
|---|---|---|
| ***100-98%*** | ***Full/Substantial*** | ***License*** |
| ***97-90%*** | ***Mid-Range*** | ***Provisional License*** |
| ***89% or less*** | ***Low*** | ***No-License*** |

States/Provinces/Jurisdictions may want to adjust these levels and the scaling based upon their actual data distribution. For example, I have found certain jurisdictions to have a very unusually skewed data distributions which means that these ranges need to be tighten even more. If the data distribution is not as skewed as the above scale than these ranges may need to be more forgiving.

This regulatory compliance decision making scale does not take into account if abbreviated methodologies are used, such as risk assessment or key indicator models that are used in a differential monitoring approach.  The above scale is to be used if a jurisdiction decides not to use a differential monitoring approach and wants to measure regulatory compliance with all regulations and complete comprehensive reviews.

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*http://RIKInstitute.com*

**Theory of Regulatory Compliance Models**

**Richard Fiene, Ph.D.**

**August 2018**

Three models are presented here which depict the theory of regulatory compliance as it has evolved over the past four decades. Initially, it was thought that there was a linear relationship between regulatory compliance and program quality as depicted in the first line graph below (see Figure 1). As compliance increased a corresponding increase in quality would be seen in the respective programs.

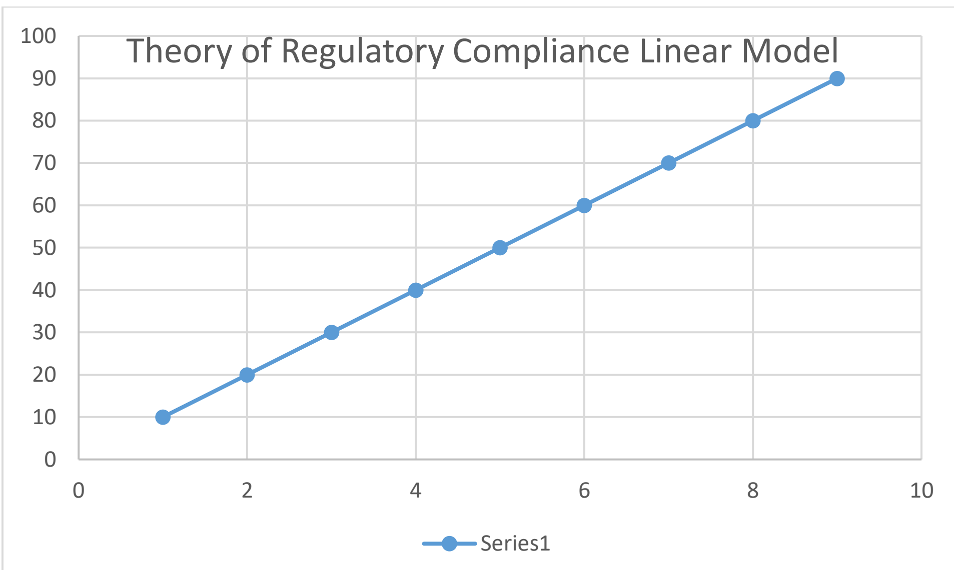


Figure 1

This initial graphic needed to be modified because of various studies conducted in order to confirm this regulatory compliance theory. It was discovered that at the lower ends of regulatory compliance there still was a linear relationship between compliance and quality. However, as the compliance scores continued to increase to a substantial level of compliance and then finally to full (100%) compliance with all rules, there was a corresponding drop off in quality as depicted in the second line graph below (see Figure 2).

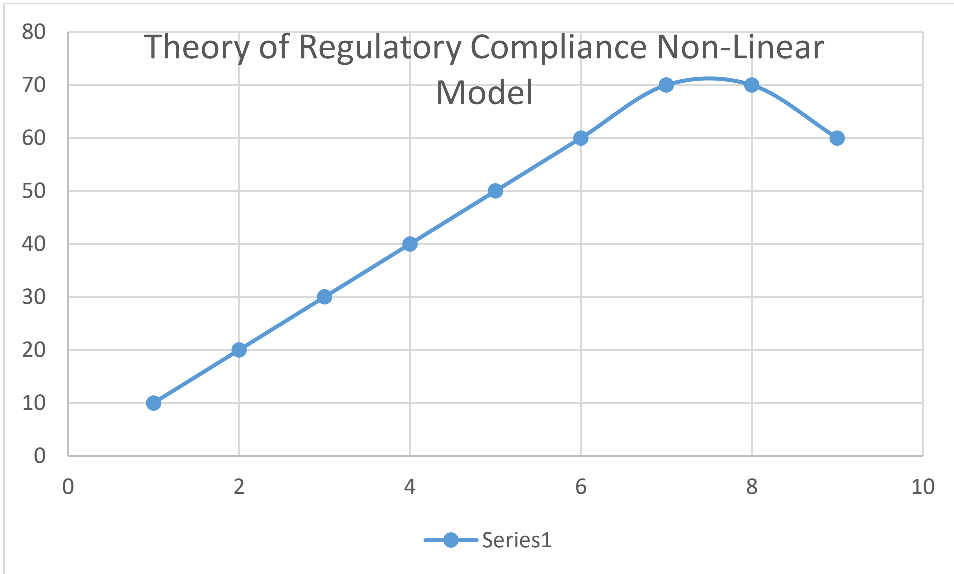


Figure 2

This Non-Linear Model has worked well in explaining the Theory of Regulatory Compliance and the studies conducted for the past three decades. However, the most recent studies related to the theory appear to be better explained by the latest proposed model in Figure 3 which suggests using a Stepped or Tiered Model rather than a Non-Linear Model. The Stepped/Tiered Model appears to explain more fully how certain less important rules can be significant predictors of overall compliance and quality.

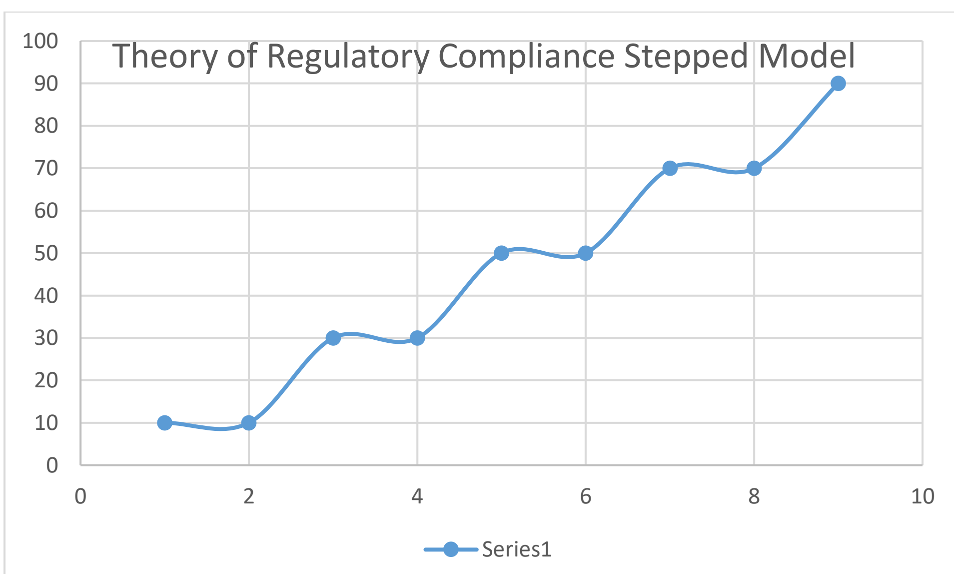


Figure 3

This last model (Stepped/Tiered) has more flexibility in looking at the full regulatory field in attempting to find the "predictor" or right rules that should be selected as key indicators. It is about identifying those key indicator rules that move the needle from one step/tier to the next rather than focusing on the plateau. So rather than having just one plateau, this model suggests that there are several plateaus/tiers.

Mathematically, the three models appear as the following:

1) $PQ = a\,(PC) + b$ ***(Linear)***

2) $PQ = a\,(PC)^b$ ***(Non-Linear)***

3) $PQ = a + ((b - a) / (1 + (PC / b)^b))$ ***(Stepped/Tiered)***

***Where PQ = Program Quality; PC = Regulatory Program Compliance; a and b are regulatory constants***

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**The Evolution of Differential Monitoring With the Risk Assessment and Key Indicator Methodologies**

**Richard Fiene, Ph.D.**

**Research Institute for Key Indicators (RIKIllc)**

**The Pennsylvania State University**

**National Association for Regulatory Administration (NARA)**

**December 2018**

The use of differential monitoring by states and Canadian Provinces has evolved very interestingly over the past decade into two parallel approaches which help to inform other interested jurisdictions as they consider a differential monitoring approach.

Differential monitoring is a more targeted or abbreviated form of monitoring facilities or programs based upon "what is reviewed/depth of the review" and "how often/frequent do we review". Two specific methodologies have been used by states to design and implement a differential monitoring approach: risk assessment and key indicators.

It was originally conceived that risk assessment and key indicator methodologies would be used in tandem and not used separately. Over the past decade, a real dichotomy has developed in which risk assessment has developed very independently of key indicators and risk assessment has become the predominant methodology used, while the key indicator methodology has lagged behind in development and implementation.

In this separate development and implementation, risk assessment has driven the "how frequent" visits in a differential monitoring approach while key indicators has driven "what is reviewed" when it comes to rules/regulations/standards.

The other development with both methodologies are the data matrices developed to analyze the data and to make decisions about frequency and depth of reviews. For risk assessment, the standard matrix used is a 3 x 3 matrix similar to the one presented below.

***Risk Assessment with Probability along the vertical axis and Risk along the horizontal axis***

| | | |
|---|---|---|
| **A** | **B** | **C** |
| **D** | **E** | **F** |
| **G** | **H** | **I** |

In the above 3 x 3 Risk Assessment Matrix, (A) indicates a very high risk rule/regulation/standard with a high likelihood that it will occur, while (I) indicates a very low or no risk rule/regulation/standard with a low likelihood that it will occur. (B) through (H) indicate various degrees of risk and probability based upon their position within the Matrix.

The decision making relationship of more frequent visits to the facility or program is made on the following algorithm:

**If I > E + F + H > B + C + D + G > A, than more frequent reviews are completed**

Just as Risk Assessment utilizes a 3 x 3 Matrix, Key Indicators utilizes a 2 x 2 Matrix in order to analyze the data and make decisions about what is reviewed. Below is an example of a 2 x 2 Matrix that has been used.

***Key Indicator with Compliance/Non-Compliance listed vertically and High vs Low Grouping listed hortizontally***

| | |
|---|---|
| **A** | **B** |
| **C** | **D** |

In the above 2 x 2 Key Indicator Matrix, (A) indicates a rule/regulation/standard that is in compliance and in the high compliant group, while (D) indicates a rule/regulation/standard that in out of compliance and in the low compliant group. (B) and (C) indicate false positives and negatives.

The decision making relationship of more rules to be reviewed is made on the following algorithm:

**If A + D > B + C, than a more comprehensive review is completed**

Given the interest in utilizing differential monitoring for doing monitoring review, having this decade's long review of how the risk assessment and key indicator methodologies have evolved is an important consideration.

Is it still possible to combine the risk assessment and key indicator methodologies? It is by combining the 3 x 3 and 2 x 2 Matrices above where the focus of utilizing the Key Indicator methodology is (I) cell of the 3 x 3 Matrix. It is only here that the Key Indicator methodology can be used when combined with the Risk Assessment methodology.

*Key Indicator and Risk Assessment Methodologies Used in Tandem*

| | | |
|---|---|---|
| **A** | **B** | **C** |
| **D** | **E** | **F** |
| **G** | **H** | **Only Use Key Indicators here** |

By utilizing the two methodologies in tandem, both frequency of reviews and what is reviewed are dealt with at the same time which makes the differential monitoring approach more effective and efficient.

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# Theory of Regulatory Compliance: Quadratic Regressions

**Richard Fiene, Ph.D.**

**December 2018**

The Theory of Regulatory Compliance has been described mathematically as a quadratic formula which captured the non-linear, U-shaped curve relating regulatory compliance and program quality. The form of the equation followed the typical quadratic:

$$Y = ax2 + bx + c$$

The problem in the use of the quadratic formula was that it was not particularly sensitive to false positives and negatives which in the regulatory compliance decision making was very problematic. Most recently, an alternative mathematical approach has been introduced by Simonsohn (2018) in his article: *Two Lines: A Valid Alternative to the Invalid Testing of U-Shaped Relationships With Quadratic Regressions:*

$$y = a + bxlow + cxhigh + d * high + ZBZ, (1)$$

***where xlow = x – xc if x < xc and 0 otherwise, xhigh = x – xc if x ≥ xc and 0 otherwise, and high = 1 if x ≥ xc and 0 otherwise.***

***Z is the (optional) matrix with covariates, and BZ is its vector of coefficients.***

This article appeared in ***Advances in Methods and Practices in Psychological Science, Vol.1(4) 538–555, DOI: 10.1177/2515245918805755, www.psychologicalscience.org/AMPPS***. This alternative approach is provided to better explain and detail the Theory of Regulatory Compliance. This very brief RIKIllc technical research note is provided for licensing and regulatory science researchers to consider as they make comparisons with their regulatory compliance data. Additional details will be provided as this alternative to quadratic regressions is applied to the ECPQI2M – Early Childhood Program Quality Improvement and Indicator Model International Data Base maintained at the Research Institute for Key Indicators (RIKIllc).

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**For additional information about the Theory of Regulatory Compliance and the Early Childhood Program Quality Improvement and Indicator Model, please go to [http://RIKInstitute.com](http://RIKInstitute.com)**

**What is the Relationship between Regulatory Compliance and Complaints in a Human Services Licensing System? RIKIllc Technical Research Note**

**Richard Fiene, Ph.D.**

**January 2019**

Within licensing measurement and the validation of licensing systems it is particularly difficult to have specific outcome metrics that can be measured within a human services licensing system. The purpose of this technical research note is to propose a potential solution to this problem.

Probably the most accurate measures of licensing outcomes focuses on improvements in the health and safety of clients within human services licensed facilities, such as: fewer injuries (safety) or higher levels of immunizations (health). Another measure related to client satisfaction is the number of complaints reported about a licensed facility by clients and the general public. The advantage of using complaints is that this form of monitoring is generally always part of an overall licensing system. In other words, the state/provincial licensing agency is already collecting these data. It is just a matter of utilizing these data in comparing the number of complaints to overall regulatory compliance.

The author had the opportunity to have access to these data, complaint and regulatory compliance data in a mid-Western state which will be reported within this technical research note. There are few empirical demonstrations of this relationship within the licensing research literature. The following results are based upon a very large sample of family child care homes (N = 2000+) over a full year of licensing reviews.

The results of comparing the number of complaints and the respective regulatory compliance levels proved to show a rather significant relationship ($r = .47$; $p < .0001$). This result is the first step in attempting to understand this relationship as well as developing a methodology and analysis schema since directionality (e.g., did the complaint occur before or after the regulatory compliance data collection?) can play a key role in the relationship (this will be developed more fully in a future technical research note). The focus of this research note was to determine if any relationship existed between regulatory compliance and complaint data and if it is worth pursuing.

It appears that looking more closely at the relationship between complaint and regulatory compliance data is warranted. It may provide another means of validating the fourth level of validation studies as proposed by Zellman and Fiene's OPRE Research Brief (*Zellman, G. L. & Fiene, R. (2012). Validation of Quality Rating and Improvement Systems for Early Care and Education and School-Age Care, Research-to-Policy, Research-to-Practice Brief OPRE 2012-29. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services)* in which four approaches to validation are delineated for Quality Rating and Improvement Systems (QRIS). This author has taken this framework and applied it to licensing systems (*Fiene (2014). Validation of Georgia's Core Rule Monitoring System, Georgia Department of Early Care and Learning*) and more recently proposed as the framework for Washington State's Research Agenda (*Stevens & Fiene (2018). Validation of the Washington State's Licensing and Monitoring System, Washington Department of Children, Youth, and Families*).

For additional information regarding the above studies, the interested reader should go to http://RIKInstitute.com.

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# Some Technical Considerations in Using Complaint Data and Regulatory Compliance Data: RIKIllc Technical Research Note #66

**Richard Fiene, Ph.D.**

**January 2019**

As promised in RIKIllc Technical Research Note #65, this Note will provide details on the methodology and analytical considerations when using complaint and regulatory compliance data together. As pointed out in the previous technical research note, using complaint data as a potential outcome appears to have merit and should be explored in greater detail. However, with that said there are some parameters that the methodology has that should be explored in order to make the analyses more meaningful.

When looking at regulatory compliance and complaint data there are four possibilities: 1) the facility is in full compliance and has no complaints; 2) the facility is in full compliance but has complaint(s); 3) the facility has some non-compliance and has no complaints; and 4) the facility has some non-compliance and has complaint(s). These four possibilities can be depicted in the following 2 x 2 matrix:

| ***Complaints*** | ***Regulatory Compliance Full (0)*** | ***Regulatory Compliance Non-Compliance (1)*** |
|---|---|---|
| ***No (0)*** | ***00 = Full & No<br>Cell C = Expected*** | ***10 = Non-Compliance & No<br>Cell B = False Positive*** |
| ***Yes (1)*** | ***01 = Full & Yes<br>Cell A = False Negative*** | ***11 = Non-Compliance & Yes<br>Cell D = Expected*** |

In the above 2 x 2 matrix, we would want to see cell C and cell D as the predominant cells and cell A and B as the less dominant cells, especially cell A because this represents a false negative result.

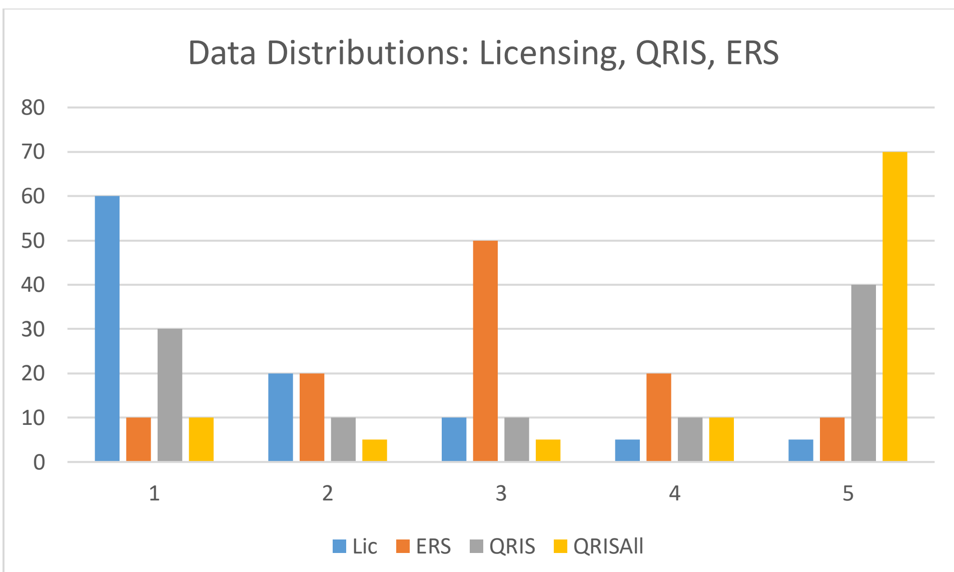
However, there are a couple of limitations to the above matrix that need to be taken into account. One, are the complaints substantiated or not. Any complaint must be substantiated to be counted in the model. If it is unsubstantiated, than it is not counted in the matrix. Two, there is the problem with directionality that needs to be addressed. For example, does the complaint occur before or after the full inspection in order to determine regulatory compliance. The 2 x 2 matrix and the modeling for these analyses is based on the complaint occurring after the full inspection and that is the reason for cell A being labeled a false negative. If the directionality is reversed and the full inspection occurs after a complaint, cell A is no longer a false negative.

# Licensing, QRIS, and ERS Data Distributions

**Richard Fiene, Ph.D.**

**January 2019**

The frequency or data distributions for licensing (lic), quality rating and improvement systems (QRIS), and environmental rating scales (ERS) are very different. ECE programs obtain very different scores in each of these assessment paradigms. This should not come as a surprise since the three assessments measure very different aspects of an ECE program: Licensing = health and safety standards; QRIS = quality standards; ERS = environmental quality. However, the statistical implications are important given these differences. The distributions are depicted in the graphic below (Data Distributions: Licensing, QRIS, ERS).




Additional notes regarding the above graphic. The licensing distribution clearly shows a highly skewed data distribution, while the ERS distribution is normally distributed, while the QRIS is bi-modal and the QRISAll which represents all providers in a state who are part of the QRIS and those who are not is highly skewed. One (1) = higher scores; 5 = lower scores.

The hope is that the above graphic will assist licensing researchers as they think about analyzing data from each of these respective systems when it comes to parametric and non-parametric statistics.

**The Relationship between Early Care & Education Quality Initiatives and Regulatory Compliance: RIKIllc Technical Research Note #67**

**Richard Fiene, Ph.D.**

**February 2019**

Over the past couple of decades there has been many early care and education initiatives, such as Quality Rating and Improvement Systems (QRIS), Professional Development, Training, Technical Assistance, Accreditation, and Pre-K programs to just name a few. Validation and evaluation studies have begun to appear in the research literature, but in these studies there has been few empirical demonstrations of the relationship between these various quality initiatives and their impact on regulatory compliance or a comparison to their respective regulatory compliance. This brief technical research note will provide examples of these comparisons taken from the Early Childhood Program Quality Improvement and Indicator Model (ECPQI2M) Data Base maintained at the Research Institute for Key Indicators (RIKIllc).

I have written about this back in 2014 (Fiene, 2014) in how the various quality initiatives were having a positive impact on the early care and education delivery system but at that point regulatory compliance data were not available. Today, in 2019, with many changes and developments in state data systems, this is no longer the case. Now it is possible to explore the relationships between data from the various quality initiatives and licensing. Several states in multiple service delivery systems have provided replicable findings in which I feel comfortable reporting out about the relationships across the data systems.

What we now know is that there is a positive and statistically significant relationship between regulatory compliance and moving up the QRIS Quality Levels. In other words, facilities have higher compliance in the higher QRIS Quality Levels and lower compliance in the lower QRIS Levels or if they do not participate in their state's respective QRIS ($F = 5.047 – 8.694$; $p < .0001$).

Other quality initiatives, such as being accredited, shows higher compliance with licensing rules than those facilities that are not accredited ($t = 2.799 - 3.853$; $p < .005 - .0001$).

This is a very important result clearly demonstrating the positive relationship between regulatory compliance and quality initiatives. I have some additional state data sets that I will add to the ECPQI2M data base and will continue to analyze these relationships.

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**Effectiveness and Efficiency Relationship Leading to Cost Benefit**

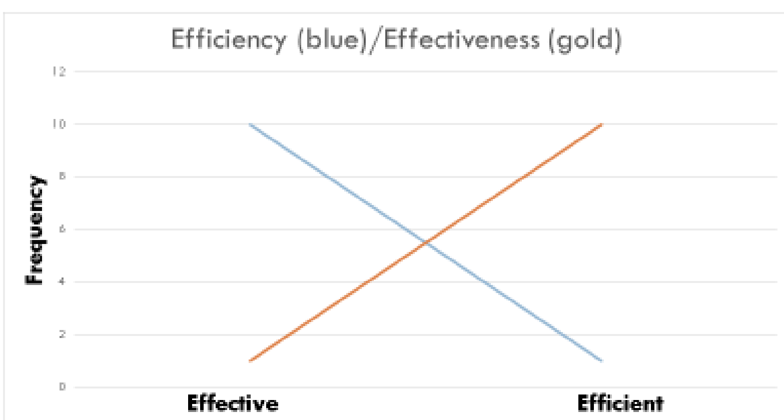
**Richard Fiene, Ph.D.**

**March 2019**

In management science and economic theory in general, the relationship between effectiveness and efficiency has been delineated in terms of two mutually exclusive processes in which you have one but not the other. This brief technical research note will outline an approach which mirrors the relationship in economics between supply and demand and how effectiveness and efficiency can be thought of as images of each other giving way to cost benefit analysis in order to have the proper balance between the two.

The proposed relationship between effectiveness and efficiency is that as one increases the other decreases in a corresponding and proportionate way as depicted in the graphic below. This relationship is drawn from my work in regulatory compliance/licensing systems in comparing data collected in comprehensive licensing reviews and abbreviated licensing reviews where only a select group of rules/regulations are measured. When comprehensive reviews are completed these reviews tend to be more effective but not very efficient use of resources. When abbreviated reviews are completed these reviews tend to be more efficient but are not as effective if too few rules are measured for compliance.

Effectiveness & Efficiency Relationship




Effectiveness deals with the quality of outputs while efficiency deals with input of resources expended. The Theory of Regulatory Compliance is finding the right balance between effectiveness and efficiency in the above graphic.  Where is the balanced "sweet" spot of inputs to produce high quality outputs.  As one can see where the effectiveness line is at the highest point and efficiency is at the lowest point, this is a very costly system that is totally out of balance.  But the same is true where efficiency is at the highest point and effectiveness is at the lowest point, this is a very cheap system that is totally out of balance producing low quality. The key to this relationship and the theory of regulatory compliance is finding that middle ground where effectiveness and efficiency are balanced and produce the best results for cost and quality and leads us directly to cost benefit analysis.

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*Research Institute for Key Indicators (RIKIllc) Technical Research Note #70.*

**Relationship of the Theory of Regulatory Compliance, Key Indicators, & Risk Assessment Rules with Weights and Compliance Data**

**Richard Fiene, Ph.D.**

**April 2019**

There is a relationship between general regulatory compliance levels, weights and how these work within the risk assessment and key indicator differential monitoring approaches. What generally happens is that there are high compliance levels with high risk assessment/weighted rules and with moderate weighted rules and low compliance levels with more low weighted rules which led to the Theory of Regulatory Compliance and an emphasis on substantial regulatory compliance. This is a general pattern and there are exceptions to every rule. Please see the chart below which depicts this relationship.

The reason for pointing this relationship out is for policy makers and researchers to be cognizant of these relationships and to be alert for when certain rules do not follow this pattern. Regulatory compliance data are very quirky data and because of its non-parametric characteristics can be difficult to analyze. I know that these results and relationships may seem self-evident, but they need emphasis because it is easy to overlook the obvious and to miss "the forest in looking at the trees".

| **Compliance** | **Weights** | **Approach** | **Violation of Approach** |
|---|---|---|---|
| High | High | Risk Assessment Rules | Low Compliance with Rule |
| High - Medium | Medium | Key Indicator Rules | False Negatives |
| Medium | Low | Substantial Compliance | 100% Compliance with all Rules |

Let's walk through this chart.

High compliance means being in compliance with all or a substantial number of rules, but always keep in mind that when we are discussing regulatory compliance, being in high compliance means 100% - 99% in compliance with all rules. This is a very high standard and most programs can achieve these levels.

Medium compliance is still rather high regulatory compliance (98% - 97%) and is generally considered a high enough level for issuing a full license with a brief plan of correction. This is a level that is considered legally to be in substantial compliance with all rules. This regulatory result of substantial compliance led to the Theory of Regulatory Compliance and the public policy suggestion that substantial and not full (100%) regulatory compliance is in the best interests of clients. Low regulatory compliance, although not part of the chart above, happens very rarely. Programs that do not meet basic health and safety rules are issued cease and desist orders and are put out of business.

High weights are rules that place clients at greatest risk and should never be out of compliance. These are the Risk Assessment Rules that are always reviewed when a licensing inspection is completed, either when a full or abbreviated/differential monitoring visit is conducted. A licensing inspector does not want to leave a facility without having checked these rules.

Medium weights are rules that are very important but do not place clients at greatest risk. They generally add to the well-being of the client but will not jeopardize their health or safety. Generally, but not always, we find these rules as part of a licensing key indicator abbreviated inspection in a differential monitoring visit. For whatever, reason, facilities in high compliance generally have these in compliance and facilities in low compliance generally have these out of compliance or not in compliance. These are our predictor rules that statistically predict overall regulatory compliance.

Low weights are rules that do not have a real risk impact on the client. They are generally paper oriented rules, record keeping type rules. A lot of times they make it into the Key Indicator Rule list because it has to do with attention to detail and at times this will distinguish a high performing provider from one that is not doing as well. However, it can also have the opposite effect and these rules can "muddy the waters" when it comes to distinguishing between really high performing facilities and facilities that are just mediocre by contributing to data distributions that are highly skewed and difficult to find the "best of the best". Licensing researchers and policymakers need to pay attention to this dichotomy.

Risk assessment rules are those rules which have been identified as the most critical in providing the safeguards for clients when in out of home facilities. These rules are very heavily weighted and usually always in compliance. A violation of this approach is finding low compliance with specific risk assessment rules. These rules constitute approximately 10-20% of all rules.

Key indicator rules are those rules which statistically predict overall compliance with all rules. There is a small number of key indicator rules that are identified, generally less than 10% of all rules. These rules are in the mid-range when it comes to their weights or risk factor. And the rules are generally in high to substantial compliance. A violation of this approach is finding a facility in compliance with the key indicator rules but finding other rules out of compliance or the facility in the low group. (Please go to the following website for additional information http://RIKInstitute.com)

Substantial compliance is when the majority of the rules are in compliance with only a couple/few rules being out of compliance which are generally low weighted rules, such as paper driven rules. These rules are in the low-range when it comes to their weights or risk factor. Nice to have in place in being able to say we have "crossed every 't' and dotted every 'i'" but not critical in protecting the health, safety and well-being of the client. A violation of substantial compliance would be requiring full (100%) compliance with all rules.

This short RIKI Technical Research Note (#71) provides some additional guidance and interpretation of how particular patterns of licensing data impact and relate to each other. It is provided because of the nuances of regulatory compliance/licensing data which have limitations from an analytical perspective (Please see the RIKINotes blog on the RIKInstitute.com website).

Here is another way of looking at the chart presented on page 1 which incorporates all the elements elaborated in the chart: **Compliance, Weights, Approach, and Violation of the Approach (V).**

| | | | | |
|---|---|---|---|---|
| | | | **Weights** | |
| | | **High Risk** | **Medium Risk** | **Low Risk** |
| **Non-** | **High NC** | **VRA** | **False Negative** | **TRC** |
| **Compliance** | **Medium NC** | | **Key Indicators** | |
| **(NC)** | **Low NC** | **Risk Assessment** | **False Positive** | **VTRC** |

*VRA = Violation of Risk Assessment; VTRC = Violation of Theory of Regulatory Compliance.*

______________________________________________

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**Risk Assessment Matrix (RAM) for the State of Washington**

**Richard Fiene, Ph.D.**

**May 2019**

Risk Assessment Matrices (RAM) are potential decision making tools developed as part of the weighting/risk assessment methodology for licensing and regulatory compliance. Most matrices have two major foci, risk/severity and prevalence/probability components. Each is rank ordered from low to medium to high risk/severity or prevalence/probability. To date there has not been much empirical data used to determine the various levels of low, medium and high that has been shared in the research literature. I am hoping to change this with this short paper.

The data drawn for this paper is taken from the National Licensing, Differential Monitoring, Key Indicator and Risk Assessment Data Base maintained at the Research Institute for Key Indicators (RIKIllc). This data base has been in existence for over 40 years and contains data from many states, provinces and national programs.

In order to determine the relative risk level of specific rules/regulations, generally a weighting system is used where a group of stakeholders in a specific state make assessments to the potential risk for clients if a specific rule is out of compliance. Usually the weighting scale is a Likert type scale going from low risk (1) to high risk (8). Medium risk usually is around a 4.

Prevalence/probability data are not as well determined in the literature and focuses more on the individual rule. However, for the purposes of this paper, I want to use prevalence/probability data drawn from regulatory compliance histories and move beyond individual rules so that the Risk Assessment Matrix (RAM) can be used more effectively for making monitoring decisions. Regulatory compliance histories will provide an overall picture of how well the program has complied with rules over time. The number of rules in Chart 1 are rules that are out of compliance in any monitoring review conducted. Based upon the National Licensing, Differential Monitoring, Key Indicator and Risk Assessment Data Base, these are the averages across jurisdictions and have become the standard thresholds for determining low, medium and high regulatory compliance.

**Chart 1 – Risk Assessment Matrix**

| | | **Probability/** | **Prevalence** | | |
|---|---|---|---|---|---|
| | **Levels** | **High** | **Medium** | **Low** | **Weights** |
| **Risk/** | **High** | ***9*** | ***8*** | ***7*** | ***7-8*** |
| **Severity** | **Medium** | ***6*** | ***5*** | ***4*** | ***4-6*** |
| | **Low** | ***3*** | ***2*** | ***1*** | ***1-3*** |
| | **# of Rules** | ***8 or more*** | ***3-7*** | ***2 or fewer*** | |

The resulting numeric scale from 1-9 provides a rank ordering when Severity/Risk and Prevalence/Probability are cross-referenced. In this rank ordering 9 = High Risk/Severity (Weight = 7-8) and High Prevalence/Probability (8 rules or more are out of compliance) while a 1 = Low Risk/Severity (Weight = 1-3) and Low Prevalence/Probability (2 rules or fewer are out of compliance). A 5 = Medium Risk/Severity (Weight = 4-6) and Medium Prevalence/Probability (3-7 rules are out of compliance).

Utilizing the data from the above Chart 1, a Monitoring Decision Making Matrix (MD2M) can be constructed for the various Licensing Tiers which will assist in determining further targeted monitoring as depicted in Chart 2 below.

**Chart 2 – Monitoring Decision Making Matrix**

| | | |
|---|---|---|
| **Tier 1** | **1,2** | **Potentially eligible for abbreviated reviews & differential monitoring + Technical Assistance (TA) being available.** |
| **Tier 2/3** | **3,4,5,6** | **Comprehensive review + required TA + potentially more frequent reviews.** |
| **Tier 4** | **7,8,9** | **Comprehensive review + required TA + Potential Sanctions that could lead to licensing revocation.** |

Chart 2 takes the data from Chart 1 and transposes the 1-9 Severity/Prevalence data (column 2) to a Tiered Decision Making Scale (Column 1) regarding targeted monitoring and technical assistance (column 3). This chart could be taken further and decisions regarding the status of the license could be made such as Tier 1 would result in a full license, Tier 2/3 would result in a provisional license, and Tier 4 would result in the removal of a license.

In the past, these decisions were generally driven by general guidance with a lack of data driving the decisions. By utilizing data from the National Licensing, Differential Monitoring, Key Indicator and Risk Assessment Data Base it is now possible to make these decisions more objective and data driven. Also, the focus of RAM's in the past has been at the individual rule/regulation level for both risk/severity and prevalence/probability. This presentation moves this level of analysis to a broader focus which looks at the program in general by incorporating regulatory compliance histories in determining prevalence/probability data.

**Risk Assessment and Licensing Decision Making Matrices: Taking into Consideration Rule Severity and Regulatory Compliance Prevalence Data**

**Sonya Stevens, Ed.D. & Richard Fiene, Ph.D.**

**June 2019**

This short paper combines the use of risk assessment and licensing decision making matrices. In the past, risk assessment matrices have been used to determine the frequency of monitoring and licensing visits and scope of reviews based upon individual rule severity, risk factors, or both. Notably, these data were lacking because they had not been aggregated to determine what type of licensing decisions should be made based upon prevalence, probability, or regulatory compliance history data. The approach described here is a proposed solution to that problem.

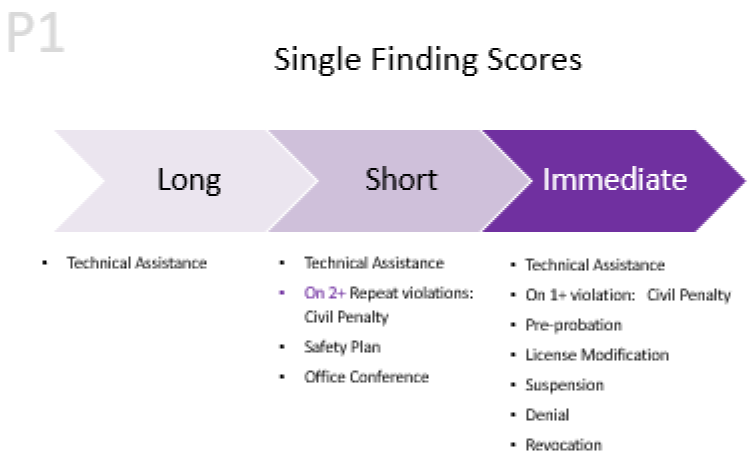
Washington State's HB 1661 (2017) redefined the department's facility licensing compliance agreement (FLCA) process. One feature of this new process is to allow licensed providers to appeal violations noted on the FLCA that do not involve "health and safety standards.[1]" To determine what licensing rules are and are not "health and safety standards" under the new definition, the department worked with community and industry stakeholders, and sought extensive public input, to assignment weights to licensing regulations. These weights were based on each regulation's risk of harm to children. A rule designed to protect against the lowest risk of harm was assigned a "1" and a rule designed to protect against the highest risk of harm was assigned an "8". Weights of "2" through "7" were determined accordingly. These weights were then grouped into three different categories based on risk:

- **Weights 8, 7 and some 6 = immediate concern**
- **Weights 4, 5 and most 6 = short term concern**
- **Weights 1, 2, and 3 = long term concern**

Using the new risk categories, the department developed a two-prong approach that considers both the risk of harm to children at the time a violation is monitored (single findings) and the risk of harm to children arising from violations noted for a given provider over a four year period (historical or overall findings). Used together, the department will assess the single findings and the historical findings to determine appropriate licensing actions, ranging from offering technical assistance to summarily suspending and revoking a child care license. In addition, the department will also note how many times a provider violates the *same* rule, with the severity of a licensing action increasing each time. For example, a violation within the short term concern category could be subject to a civil penalty when violated the second (or potentially the 3rd) time in a four-year period. Whereas, a violation in the immediate concern category could be subject to a civil penalty or more severe action upon the first violation. (See Graphic for Step 1).

[1] Washington law governing child care and early learning defines "health and safety standards" to mean "rules or requirements developed by the department to protect the health and safety of children against substantial risk of bodily injury, illness, or death." RCW 43.216.395(2)(b).

***Step 1:***




A more difficult task is assigning initial thresholds for the overall finding score. It is this second step (Step 2) where we need to consider probability and severity side by side as depicted in Chart 1 below which is generally considered the standard Risk Assessment Matrix in the licensing research literature:

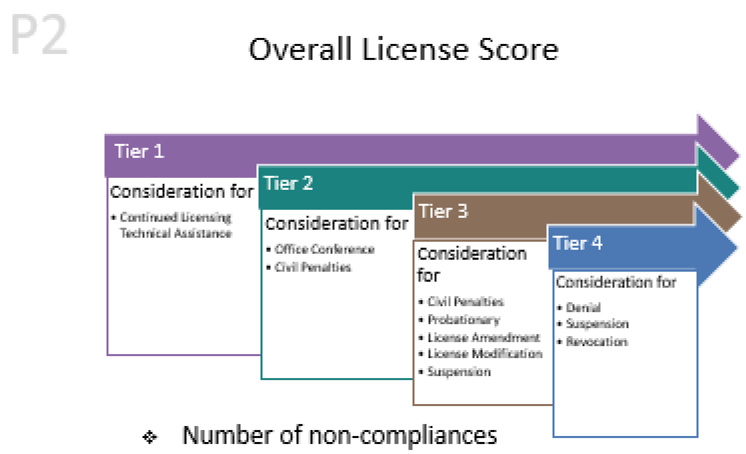
***Step 2:***

**Chart 1 – Risk Assessment Matrix**

| | | | | | |
|---|---|---|---|---|---|
| | | **Probability/** | **Prevalence** | | |
| | **Levels** | **High** | **Medium** | **Low** | **Weights** |
| **Risk/** | **High** | ***9*** | ***8*** | ***7*** | ***7-8*** |
| **Severity** | **Medium** | ***6*** | ***5*** | ***4*** | ***4-6*** |
| | **Low** | ***3*** | ***2*** | ***1*** | ***1-3*** |
| | **# of Rules** | ***8 or more*** | ***3-7*** | ***2 or fewer*** | |

The next step (Step 3) is to build in licensing decisions using a graduated Tiered Level system as depicted in the following figure. In many jurisdictions, a graduated Tiered Level system is used to make determinations related to monitoring visits (frequency and scope) and not necessarily for licensing decisions.

***Step 3:***




- Number of non-compliances
- Scores used to calculate 'licensing score'
- Lower licensing scores = higher compliance

Step 4 involves combining steps 1 and 2 into a revised risk assessment matrix as depicted in the following chart:

***Step 4:***

**Risk Assessment (RA) Matrix Revised**

| | **Levels** | **High** | **Medium** | **Low** |
|---|---|---|---|---|
| | **Immediate** | **9** | **8** | **7** |
| ***Risk/Severity*** | **Short-term** | **6** | **5** | **4** |
| | **Long-term** | **3** | **2** | **1** |
| | | | ***Probability*** | |
| | **Regulatory Compliance (RC): # of Rules out of compliance and In compliance** | **8+ rules out of compliance. 92 or less regulatory compliance.** | **3-7 rules out of compliance. 93 – 97 regulatory compliance.** | **2 or fewer rules out of compliance. 98 – 99 regulatory compliance.** |

The last step (Step 5) is to take steps 3 and 4 and combine them together into the following charts which will provide guidance for making licensing decisions about individual programs based upon regulatory compliance prevalence, probability, and history as well as rule risk/severity data.

***Step 5:***

**Licensing Decision Making Matrix***

**Tier 1 = (1 – 2) RA Matrix Score**

**Tier 2 = (3) RA Matrix Score**
**Tier 3 = (4 – 5) RA Matrix Score**

**Tier 4 = (6 – 9) RA Matrix Score**

***Regulatory Compliance (RC)(Prevalence/Probability/History + Risk/Severity Level)**

**Tier 1 = ((RC = 93 – 97) + (Low Risk)); ((98 – 99) + (Low Risk)) = Tier 1**

**Tier 2 = (RC = 92 or less) + (Low Risk) = Tier 2**

**Tier 3 = ((RC = 93 – 97) + (Medium Risk)); ((98 – 99) + (Medium Risk)) = Tier 3**

**Tier 4 = (RC = (92 or less) + (Medium Risk)) = Tier 4; (( 93 -97) +(High Risk)) = Tier 4; ((98 – 99) + (High Risk)); ((92 or less) + (High Risk)) = Tier 4+**

The following algorithms should be followed in moving from the Risk Assessment Matrix (RAM) (Step 4) to the Licensing Decision Making Matrix (Step 5):

1) Σ (Yr1 RC + Yr2 RC + Yr3 RC + Yr4 RC).
2) Identify all rules by high, medium, low, no risk levels. HR, MR, LR, NULL.
3) HR = Tier4.
4) Σ NC Total/# of Years = Average NC.
5) Σ NC by RCH, RCM, and RCL.
6) LR + RCL or LR + RCM = Tier 1.
7) LR + RCH = Tier 2.
8) MR + RCL or MR + RCM = Tier 3.
9) MR + RCH or HR + RCM or HR + RCL = Tier 4.
   HR + RCH = Tier 4+.

***Risk Level:***
**HR = High Risk (7-8 weights)**
**MR = Medium Risk (4-6 weights)**
**LR = Low Risk (1-3 weights)**
***Prevalence Level:***
**RCH = High Non Compliance (NC) (8+) or Low Regulatory Compliance (RC) (92 or less)**
**RCM = Medium Non Compliance (3-7) or Medium Regulatory Compliance (93-97)**
**RCL = Low Non Compliance (1-2) or High Regulatory Compliance (98-99)**

**The Principles of Regulatory Compliance Measurement**

**Richard Fiene, Ph.D.**

**Research Institute for Key Indicators (RIKIllc)**

**The Pennsylvania State University**

**National Association for Regulatory Administration (NARA)**

**June 2019**

The principles of regulatory compliance measurement will be described in this short technical research note covering comprehensive licensing inspections, abbreviated licensing inspections through weighted risk assessment, and how the resultant scoring protocols can be used to make licensing decisions.

Usually when one thinks about regulatory compliance the number of violations are generally the prominent number that most people associate with measuring this concept. So zero (0) violations on a comprehensive licensing inspection is a very good result or number. But what is a not so good number when thinking about regulatory compliance. Based upon the past 40 years of licensing research in which I have established and maintained an international data base related to regulatory compliance, there are trends in data which will help to inform us about what potential thresholds could be in thinking about the number of violations. There is a brief footnote to add to this discussion and that is the impact of the Theory of Regulatory Compliance (Fiene, 1985, 2016, 2019) in which substantial (1-2 violations of low risk rules) and not full compliance (0 violations) is more characteristic of high quality programs.

After taking the Theory of Regulatory Compliance into account, the following ranges based upon the international data base provides us with the following: a provisional level of regulatory non-compliance is between 3 - 7 violations while a low level of regulatory non-compliance is 8+ violations. This results are based upon annual comprehensive licensing inspections in which all rules are measured for compliance. The scoring and license decision making is rather straightforward where if a program has 0 - 2 violations than they would receive a full license; 3 - 7 violations would result in a provisional license with a good deal of technical assistance; and 8+ violations would result in negative sanctions being applied. This scoring protocol takes prevalence data into account but not the relative weight or risk assessment of regulatory non-compliance. That is where differential monitoring can play a role in constructing a licensing risk assessment matrix which is used by a number of jurisdictions in the US and Canada.

Weighted Risk Assessment Matrices have been used to make determinations about individual rules and how often to monitor a program but have not been used in conjunction with License Decision Making as outlined in the above paragraphs. Depicted below is a standard 3 x 3 Risk Assessment Matrix format that is used by the majority of jurisdictions in the US and Canada. In the more general research literature on risk assessment, the cells may vary from this 3 x 3 format and might use a 4 x 4 or 5 x 5 format, but the result is the same.

***Standard Risk Assessment Matrix: Risk Assessment with Probability along the vertical axis and Risk along the horizontal axis***

| | | |
|---|---|---|
| **A** | **B** | **C** |
| **D** | **E** | **F** |
| **G** | **H** | **I** |

In the above 3 x 3 Standard Risk Assessment Matrix, (A) indicates a very high risk rule with a high likelihood that it will occur or high general non-compliance is present or there will be additional monitoring warranted, while (I) indicates a very low or no risk rule with a low likelihood that it will occur or low general non-compliance is present or there will be the opportunity to utilize an abbreviated monitoring protocol. (B) through (H) indicate various degrees of risk and probability based upon their position within the Matrix.

Let's merge the risk assessment designation with the regulatory non-compliance probability data from the earlier paragraphs in the following manner: A = (High Risk Rule) + (8+ Violations); B = (High Risk Rule) + (3-7 Violations); C = (High Risk Rule) + (1-2 Violations); D = (Medium Risk Rule) + (8+ Violations); E = (Medium Risk Rule) + (3-7 Violations); F = (Medium Risk Rule) + (1-2 Violations); G = (Low Risk Rule) + (8+ Violations); H = (Low Risk Rule) + (3-7 Violations); I = (Low Risk Rule) + (1-2 Violations).

The last step is now to take the results of the above 3 x 3 Risk Assessment Matrix and combine this with license decision making as was outlined in the above paragraphs for comprehensive inspections. Risk scores are the predominant factor but the probability or prevalence scores do factor into the overall equation in the following manner especially at the high probability levels: A, B, C, D = Negative sanctions; E, F, G = Provisional license; H, I = Full license.

***Risk Assessment, Regulatory Non-Compliance and License Decision Making Matrix***

| | | |
|---|---|---|
| **A = Negative sanction** | **B = Negative sanction** | **C = Negative sanction** |
| **D = Negative sanction** | **E = Provisional license** | **F = Provisional license** |
| **G = Provisional license** | **H = Full license** | **I = Full license** |

By utilizing this matrix a jurisdiction can now account for both risk assessment and regulatory non-compliance data at the same time in order to make a more informed licensing decision. A validation study is being conducted in the state of Washington to determine the effectiveness of these above two matrices (Stevens & Fiene, 2019).

**References:**

Fiene (1985). Measuring the effectiveness of regulations, *The New England Journal of Human Services*, *5/2, pages 38-39.*

Fiene (2016). *The theory of regulatory compliance*, Research Institute for Key Indicators, ResearchGate.

Fiene (2019). Treatise on the theory of regulatory compliance, *Journal of Regulatory Science, Volume 7*, pages 1-3.

Stevens & Fiene (2019). *Risk assessment and licensing decision making matrices: Taking into consideration rule severity and regulatory compliance prevalence data*, National Association for Regulatory Administration and the Washington Department of Children, Youth, and Families.

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**Regulatory Compliance (RC) and Program Quality (PQ) Data Distributions**

**Richard Fiene, Ph.D.**

**July 2019**

This report will provide the data distributions for a series of regulatory compliance (RC) and program quality (PQ) studies which show dramatically different frequencies and centralized statistics. The regulatory compliance data distributions have some very important limitations that will be noted as well as some potential adjustments that can be made to the data sets to make statistical analyses more meaningful. These data distributions are from the USA and Canada.

***For purposes of reading the following Table 1, a Legend is provided:***
***Data Set = the study that the data are drawn from.***
***Sites = the number of sites in the particular study.***
***mean = the average of the scores.***
***sd = standard deviation.***
***p0 = the average score at the 0 percentile.***
***p25 = the average score at the 25th percentile.***
***p50 = the average score at the 50th percentile or the median.***
***p75 = the average score at the 75th percentile.***
***p100 = the average score at the 100th percentile.***

**Table 1**

| Data Set | Sites | mean | sd | p0 | p25 | p50 | p75 | p100 | PQ or RC |
|---|---|---|---|---|---|---|---|---|---|
| ECERS total score | 209 | 4.24 | 0.94 | 1.86 | 3.52 | 4.27 | 4.98 | 6.29 | PQ |
| FDCRS total score | 163 | 3.97 | 0.86 | 1.71 | 3.36 | 4.03 | 4.62 | 5.54 | PQ |
| ECERS and FDCRS totals | 372 | 4.12 | 0.91 | 1.71 | 3.43 | 4.12 | 4.79 | 6.29 | PQ |
| ECERS prek | 48 | 4.15 | 0.74 | 2.56 | 3.6 | 4.15 | 4.65 | 5.56 | PQ |
| ECERS preschool | 102 | 3.42 | 0.86 | 1.86 | 2.82 | 3.26 | 4.02 | 5.97 | PQ |
| ITERS | 91 | 2.72 | 1.14 | 1.27 | 1.87 | 2.34 | 3.19 | 5.97 | PQ |
| FDCRS | 146 | 2.49 | 0.8 | 1.21 | 1.87 | 2.42 | 2.93 | 4.58 | PQ |
| CCC RC | 104 | 5.51 | 5.26 | 0 | 2 | 4 | 8 | 25 | RC |
| FCC RC | 147 | 5.85 | 5.71 | 0 | 2 | 4 | 8.5 | 33 | RC |
| CCC RC | 482 | 7.44 | 6.78 | 0 | 2 | 6 | 11 | 38 | RC |
| FDC RC | 500 | 3.52 | 4.05 | 0 | 0 | 2 | 5 | 34 | RC |
| CI Total Violations | 422 | 3.33 | 3.77 | 0 | 1 | 2 | 5 | 24 | RC – PQ |
| CLASS ES | 384 | 5.89 | 0.36 | 4.38 | 5.69 | 5.91 | 6.12 | 6.91 | PQ |
| CLASS CO | 384 | 5.45 | 0.49 | 3.07 | 5.18 | 5.48 | 5.77 | 6.56 | PQ |
| CLASS IS | 384 | 2.98 | 0.7 | 1.12 | 2.5 | 2.95 | 3.37 | 5.74 | PQ |
| CLASS TOTAL OF THREE SCALES | 384 | 14.33 | 1.32 | 8.87 | 13.52 | 14.33 | 15.11 | 17.99 | PQ |
| ECERS Average | 362 | 4.52 | 1.05 | 1.49 | 3.95 | 4.58 | 5.25 | 7 | PQ |
| FDCRS Average | 207 | 4.5 | 1 | 1.86 | 3.83 | 4.66 | 5.31 | 6.71 | PQ |
| CCC RC | 585 | 5.3 | 5.33 | 0 | 2 | 4 | 8 | 51 | RC |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| QRIS | 585 | 2.78 | 1.24 | 0 | 2 | 3 | 4 | 4 | PQ |
| FDC RC | 2486 | 2.27 | 3.42 | 0 | 0 | 1 | 3 | 34 | RC |
| FDC PQ | 2486 | 1.35 | 1.26 | 0 | 0 | 1 | 2 | 4 | PQ |
| CCC RC | 199 | 7.77 | 8.62 | 0 | 3 | 6 | 10 | 61 | RC |
| CCC RC | 199 | 6.69 | 10.32 | 0 | 1 | 4 | 8 | 98 | RC |
| CCC RC | 199 | 6.77 | 7.91 | 0 | 1.5 | 4 | 8.5 | 57 | RC |
| QRIS | 199 | 1.06 | 1.32 | 0 | 0 | 1 | 2 | 4 | PQ |
| CCC RC | 199 | 7.08 | 6.96 | 0 | 2.33 | 5.67 | 9.84 | 52 | RC |
| QRIS | 381 | 2.55 | 0.93 | 0 | 2 | 3 | 3 | 4 | PQ |
| CCC RC | 1399 | 1.13 | 2.1 | 0 | 0 | 0 | 1 | 20 | RC |
| CCC RC | 153 | 5.28 | 5.97 | 0 | 1 | 3 | 6 | 32 | RC |
| FDC RC | 82 | 3.52 | 4.36 | 0 | 0 | 2 | 4 | 21 | RC |

It is obvious when one observes the PQ as versus the RC data distributions that the RC data distributions are much more skewed, medians and means are significantly different, and kurtosis values are much higher which means that the data contain several outliers. These data distributions are provided for researchers who may be assessing regulatory compliance (RC) data for the first time. There are certain limitations of these data which are not present in more parametric data distributions which are more characteristic of program quality (PQ) data.

To deal with the level of skewness of RC data, weighted risk assessments have been suggested in order to introduce additional variance into the data distributions. Also, dichotomization of data has been used successfully with very skewed data distributions as well. One of the problems with very skewed data distributions is that it is very difficult to distinguish between high performing providers and mediocre preforming providers. Skewed data distributions provide no limitations in distinguishing low preforming providers from their more successful providers.

# A Commentary on Public Policy Analysis for Regulatory Scientists: Dealing with Regulatory Compliance Data that are Nominally Measured and Negatively Skewed

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**July 2019**

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The purpose of this article is to provide some context for regulatory scientists in pursuing public policy analysis, especially as it relates to regulatory compliance and human service licensing data. Regulatory scientists have dealt with non-parametric data very effectively in the past but in dealing with regulatory compliance and human service licensing data are just so different from previously measured data in that the nature of the data is nominal and extremely skewed to the point that several adjustments need to be made in order to analyze the data.

There are very logical reasons why regulatory compliance and licensing data are so extremely skewed. These data represent compliance with basic health and safety rules and regulations which provide the basic safeguards for children, youth, and adults while being cared for in a form of human services, such as child care, youth residential, or adult assisted living care. Very honestly a state agency would not want to find their regulatory compliance data being normally distributed because this would be an indication that the facilities were in low compliance with the state's rules and regulations. Having the regulatory compliance data be highly negatively skewed is actually a good result from a public policy standpoint but not from a statistical analytical standpoint. Having 50-60% of your scores within a three to five point range when there may be as many as 300-400 data points leaves very little variance in the data. It also leads to being very difficult to distinguish between the high performers and the mediocre performers. This finding has led to a theory of regulatory compliance in which substantial compliance but not full compliance with all rules and regulations is in the best interests of the clients being served (Fiene, 2019). In the regulatory science field, this has led to public policies emphasizing substantial compliance in order to be a licensed human service facility, such as a child care center, youth residential program, or an adult assisted living center.

The other aspect of regulatory compliance and licensing data for regulatory scientists to consider is that the data are nominal in measurement, either a facility is in compliance or out of compliance with a specific rule or regulation. There are no gray areas, no measurement on an ordinal scale. There has been some discussion in the regulatory science field for the use of weighted risk assessment methodologies which could introduce more variance in the data based upon the assumption that all rules or regulations are not created equal nor are they administered equally (Stevens & Fiene, 2019). Another discussion revolves around the introduction of more program quality into the basic health and safety rules and regulations that could extend the nominal compliance determination to an ordinal scale that goes beyond the basic compliance level (Fiene, 2018).

These measurement idiosyncracies of regulatory compliance and licensing data are presented for regulatory scientists to consider if they begin to analyze public policies that involve basic health and safety rules and regulations which are very different from other public policies being promulgated by state and national governments.

For the interested reader, an international data base for regulatory compliance and human services licensing data has been established and maintained by the Research Institute for Key Indicators and Penn State University over the past 40 years at the following URL - (***http://RIKInstitute.com***)

## References

Fiene (2018). ***The Implications in Regulatory Compliance Measurement When Moving from Nominal to Ordinal Scaling (RIKIResearch Note)***. Research Institute for Key Indicators. (**doi: 10.13140/RG.2.2.21926.57923**)

Fiene (2019). A treatise on the theory of regulatory compliance. ***Journal of Regulatory Science***, ***Volume 7(1),*** pps 1-3. (**doi.org/10.21423/jrs-v07fiene**)

Stevens & Fiene (2019). ***Risk Assessment and Licensing Decision Making Matrices: Taking into Consideration Rule Severity and Regulatory Compliance Prevalence Data.*** Seattle, Washington: Department of Children, Youth, and Families. (**doi: 10.13140/RG.2.2.22811.11046**)

## Author Contributions

Richard Fiene is the sole author of this article and is responsible for its content.

## Declaration of Conflicting Interests

The author declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

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# A Theory on the Relationship With Professional Development, Program Quality and Regulatory Compliance Predicting Early Childhood Outcomes

**Richard Fiene, Ph.D.**

**July 2019**

This abstract is the compilation of 50 years of research into early childhood professional development, program quality indicators and regulatory compliance and their respective impact on early childhood outcomes. Professional development, program quality and regulatory compliance all have impacts on early childhood outcomes (ECO) but if we put them all in the same equation, what are their relative impact on outcomes. That is the purpose of this abstract. Based upon results from the Research Institute for Key indicators (RIKI) Early Childhood Program Quality Improvement and Indicators Model (ECPQIM) data base, it is now possible to ascertain their relative weights.

For purposes of this abstract, professional development (PD) includes any training, coaching or technical assistance which focuses on teaching staff. Program quality (PQ) includes Quality Rating and Improvement Systems (QRIS) standards and their respective observational evaluations (ERS, CLASS). Regulatory compliance (RC) includes licensing health and safety rules and regulations as promulgated and enforced by state agencies. In the past, these systems have been dealt with in silos and there has been very little attempts at combining them in any fashion. One of the results of the ECPQIM data base was and is to attempt combining these various systems into a unified equation or algorithm.

Based on the results of the ECPQIM data base results, the following equation/algorithm can depict this unified relationship:

$$\mathbf{ECO = \Sigma\ (.50PD + .30PQ + .20RC)}$$

In this relationship, the largest impact comes from the PD system, followed by the PQ system and lastly by the RC system. The implications of this relationship are that states may want to reconsider how they are allocating resources based upon this above equation/algorithm. This is a controversial proposal but one that should be considered since it is driven by empirical evidence into the relative impact over the past 50 years of research related to professional development, program quality and regulatory compliance as they relate to early childhood outcomes.

**Grantee Performance Management System Key Indicators**

**Richard Fiene, Ph.D.**

**June 2020**

The purpose of this technical research note is to provide the methodology for creating the key indicators for the Office of Head Start's Grantee Performance Management System (GPMS) through the use of Performance Measures (PMs). The methodology used has been used within the regulatory compliance field for the past 40 years. Because of the nature of regulatory compliance data being extremely skewed, dichotomization of data is needed in order to accent the differences between low, mediocre, substantial and high compliant programs/grantees. The following chart depicts the PMs correlations (phi coefficients) with overall regulatory compliance (RC) and CLASS scores (ES, CO, IS).

| PM | ES | CO | IS | RC |
|---|---|---|---|---|
| ECD1 | -.21 | -.05 | -.13 | .27 |
| **ECD3** | **.41** | **.69*** | **.87*** | **.71*** |
| ECD4 | --- | --- | --- | .27 |
| ERSEA1 | .59 | .17 | .36 | **.52*** |
| ERSEA2 | .26 | .10 | .43 | .34 |
| ERSEA3 | .32 | **.99*** | .41 | **.44*** |
| FCE1 | .25 | -.05 | .40 | .36 |
| FCE2 | .32 | .08 | .41 | **.49*** |
| **FCE3** | **.37** | **.69*** | **.58*** | **.53*** |
| FIS1 | .25 | -.05 | .40 | .16 |
| FIS2 | .03 | -.08 | -.19 | .26 |
| FIS3 | --- | --- | --- | .21 |
| FIS4 | .10 | .10 | .24 | .21 |
| **HEA1** | **.46** | **.99*** | **.73*** | **.56*** |
| HEA2 | .21 | .05 | .13 | **.42*** |
| HEA3 | -.25 | .05 | -.40 | --- |
| HEA4 | --- | --- | --- | --- |
| HEA5 | --- | --- | --- | .16 |
| **PMQ1** | **.52** | **.69*** | **.73*** | **.56*** |
| PMQ2 | .25 | **.99*** | .40 | **.44*** |
| PMQ3 | .32 | .08 | .41 | **.38*** |
| PMQ4 | --- | --- | --- | .28 |

***p < .05***

The CLASS scores are based upon 20 observations and the regulatory compliance scores are based upon 44 observations and are all from FA2 reviews.

# Technical Detail Updates to the Fiene Key Indicator Methodology

## January 2015

The Key Indicator Methodology has recently been highlighted in a very significant Federal Office of Child Care publication series on Contemporary Licensing Highlights. In that Brief the Key Indicator Methodology is described as part of a differential monitoring approach along with the risk assessment methodology. Because of the potential increased interest in the Key Indicator Methodology, a brief update regarding the technical details of the methodology is warranted. For those readers who are interested in the historical development of Key Indicators I would suggest they download the resources available at the end of the paper.

This brief paper provides the technical and statistical updates for the key indicator methodology based upon the latest research in the field related to licensing and quality rating & improvement systems (QRIS). The examples will be drawn from the licensing research but all the reader needs to do is substitute “rule” for “standard” and the methodology holds for QRIS.

Before proceeding with the technical updates, let me review the purpose and conceptual underpinning of the Key Indicator Methodology. Key Indicators generated from the methodology are not the rules that have the highest levels of non-compliance nor are they the rules that place children most at risk of mortality or morbidity. Key Indicators are generally somewhere in the middle of the pack when it comes to non-compliance and risk assessment. The other important conceptual difference between Key Indicators and risk assessment is that only Key Indicators statistically predict or are predictor rules of overall compliance with all the rules for a particular service type. Risk assessment rules do not predict anything other than a group of experts has rated these rules as high risk for children’s mortality/morbidity if not complied with.

Something that both Key Indicators and risk assessment have in common is through their use one will save time in their monitoring reviews because you will be looking at substantially fewer rules. But it is only with Key Indicators that you can statistically predict additional compliance or non-compliance; this is not the case with risk assessment in which one is only looking at those rules which are a state’s high risk rules. And this is where differential monitoring comes into play by determining which programs are entitled to either Key Indicators and/or risk assessment for more abbreviated monitoring reviews rather than full licensing reviews (the interested reader should see the *Contemporary Licensing Series on Differential Monitoring, Risk Assessment and Key Indicators* published by the Office of Child Care.

**Technical and Statistical Framework**

One of the first steps in the Key Indicator Methodology is to sort the licensing data into high and low groups, generally the highest and lowest licensing compliance with all the rules can be used for this sorting. Frequency data will be obtained on those programs in the top level (usually top 20-25%) and the bottom level (usually the bottom 20-25%). The middle levels are not used for the purposes of these analyses. These two groups (top level & the bottom level) are then compared to how each program scored on each child care rule (see Figure 1). In some cases, especially where there is very high compliance with the rules and the data are extremely skewed, it may be necessary to use all those programs that are in full (100%) compliance with all the rules as the high group. The next step is to look at each rule and determine if it is in compliance or out of compliance with the rule. This result is cross-referenced with the High Group and the Low Group as depicted in Figure 1.

| **Figure 1** | ***Providers In Compliance on Rule*** | ***Programs Out Of Compliance on Rule*** | ***Row Total*** |
|---|---|---|---|
| ***Highest level (top 20-25%)*** | ***A*** | ***B*** | ***Y*** |
| ***Lowest level (bottom 20-25%)*** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | ***Grand Total*** |

Once the data are sorted in the above matrix, the following formula (Figure 2) is used to determine if the rule is a key indicator or not by calculating its respective Key Indicator coefficient. Please refer back to Figure 1 for the actual placement within the cells. The legend (Figure 3) below the formula shows how the cells are defined.

**Figure 2 – Formula for Fiene Key Indicator Coefficient**

$$\phi = (A)(D) - (B)(C) \div \sqrt{(W)(X)(Y)(Z)}$$

**Figure 3 – Legend for the Cells within the Fiene Key Indicator Coefficient**

***A = High Group + Programs in Compliance on Specific Rule.***
***B = High Group + Programs out of Compliance on Specific Rule.***
***C = Low Group + Programs in Compliance on Specific Rule.***
***D = Low Group + Programs out of Compliance on Specific Rule.***

***W = Total Number of Programs in Compliance on Specific Rule.***
***X = Total Number of Programs out of Compliance on Specific Rule.***
***Y = Total Number of Programs in High Group.***
***Z = Total Number of Programs in Low Group.***

Once the data are run through the formula in Figure 2, the following chart (Figure 4) can be used to make the final determination of including or not including the rule as a key indicator. Based upon the chart in Figure 4, it is best to have a Key Indicator Coefficient approaching +1.00 however that is rarely attained with licensing data but has occurred in more normally distributed data.

Continuing with the chart in Figure 4, if the Key Indicator Coefficient is between +.25 and -.25, this indicates that the indicator rule is unpredictable in being able to predict overall compliance with the full set of rules. Either a false positive in which the indicator appears too often in the low group as being in compliance, or a false negative in which the indicator appears too often in the high group as being out of compliance. This can occur with Key Indicator Coefficients above +.25 but it becomes unlikely as we approach +1.00 although there is always the possibility that other rules could be found out of compliance. Another solution is to increase the number of key indicator rules to be reviewed but this will cut down on the efficiency which is desirable and the purpose of the key indicators.

The last possible outcome with the Key Indicator Coefficient is if it is between -.26 and -1.00, this indicates that the indicator is a terrible predictor because it is doing just the opposite of the decision we want to make. The indicator rule would predominantly be in compliance with the low group rather than the high group so it would be statistically predicting overall non-compliance. This is obviously something we do not want to occur.

Figure 5 gives the results and decisions for a QRIS system. The thresholds in a QRIS system are increased dramatically because QRIS standard data are less skewed than licensing data and a more stringent criterion needs to be applied in order to include particular standards as Key Indicators.

**Figure 4 – Thresholds for the Fiene Key Indicators for Licensing Rules**

| Key Indicator Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.26) | Good Predictor | Include |
| (+.25) – (-.25) | Unpredictable | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

**Figure 5 – Thresholds for the Fiene Key Indicators for QRIS Standards**

| Key Indicator Range | Characteristic of Indicator | Decision |
|---|---|---|
| (+1.00) – (+.76) | Good Predictor | Include |
| (+.75) – (-.25) | Unpredictable | Do not Include |
| (-.26) – (-1.00) | Terrible Predictor | Do not Include |

**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.

# Population Health Observatory

## Child and residential care facility regulations ranked by the Fiene key indicator methodology_Supplementary Analysis

**FROM:** Fraser Health, Population Health Observatory

**TO:** Oonagh Tyson, Director, Health Protection; Amy Lubik, CCFL, Policy Analyst, HEPHU

**CC:** Rahul Chhokar, Manager, Population Health Observatory; Emily Newhouse, MHO, Health Protection;

**DATE:** Jan 23, 2020

**REQUEST:** To repeat the Fiene key indicator methodology using the 'First Inspection' sample selection approach on 2018/19 fiscal data ("supplementary analysis"), with the intention of using the most recent fiscal period with complete inspection data (2018/19) to generate the 'Key Indicators' for the project moving forward. Findings will be compared to the 2017/18 fiscal period results and the results of the former analysis on 2014/15 fiscal data (both provided in previous report).

### SUMMARY

- Following the project team meeting on January 13, 2020, the decision was made to proceed with the "First Inspection" approach, whereby the Fiene Coefficients are calculated based on inspections during a single fiscal period, with the following conditions/exceptions:
    - Where multiple inspections have taken place in the fiscal period, only the first inspection was used
    - When a facility did not have an inspection during the fiscal period being analyzed, the first inspection occurring in the subsequent fiscal period was used (if available*)
- Fiene coefficients were calculated for each of 249 regulations, and "good predictors" were identified (*see APPENDIX B for more detail*).
- Child Care and Residential Care licensing inspection data from Data from April 1, 2018 to January 13, 2020* were extracted from Healthspace and included in this supplementary analysis.

*note: inspection data incomplete for 2019/20 fiscal period

## KEY FINDINGS:

**Table 1.** Regulations identified as "good predictors" (Fiene Coefficient of ≥ .26) of overall compliance by facility type: Childcare (left) and Residential care (right). Two recent fiscal periods are compared, in addition to previous findings from 2017.

### CHILDCARE FACILITIES

| | REGULATION CODE | FIENE COEFFICIENT 2017/18 Fiscal | 2018/19 Fiscal | 2014/15 Fiscal (previous analysis) |
|---|---|---|---|---|
| *Common across both fiscal periods* | 11010 | 0.43 | 0.51 | |
| | 19090 | 0.45 | 0.46 | 0.46 |
| | 19070 | 0.47 | 0.44 | 0.43 |
| | 12140 | 0.39 | 0.44 | 0.49 |
| | 12040 | 0.45 | 0.44 | |
| | 11200 | 0.37 | 0.42 | 0.41 |
| | 19100 | 0.42 | 0.42 | 0.34 |
| | 12090 | 0.42 | 0.38 | 0.39 |
| | 12050 | 0.38 | 0.37 | 0.45 |
| | 11020 | 0.35 | 0.36 | 0.42 |
| | 13050 | 0.31 | 0.34 | 0.34 |
| | 19080 | 0.38 | 0.33 | 0.31 |
| | 10050 | 0.27 | 0.32 | 0.31 |
| | 19160 | 0.34 | 0.30 | |
| | 15030 | 0.28 | 0.29 | 0.35 |
| | 12060 | 0.27 | 0.29 | |
| *Differed between fiscal periods* | 12430 | --- | 0.29 | |
| | 13060 | --- | 0.29 | |
| | 13020 | --- | 0.28 | 0.30 |
| | 14030 | 0.26 | --- | 0.30 |
| | *Total "Good" Predictors* | *17* | *19* | 14* |

*In total, 16 regulations were identified in the 2017 analysis (2 not listed here)

### RESIDENTIAL CARE FACILITIES

| | REGULATION CODE | FIENE COEFFICIENT 2017/18 Fiscal | 2018/19 Fiscal | 2014/15 Fiscal (previous analysis) |
|---|---|---|---|---|
| *Common across both fiscal periods* | 31300 | 0.39 | 0.48 | 0.46 |
| | 33280 | 0.423 | 0.45 | --- |
| | 31290 | 0.48 | 0.44 | 0.48 |
| | 31260 | 0.37 | 0.38 | 0.41 |
| | 32320 | 0.48 | 0.37 | 0.38 |
| | 32100 | 0.41 | 0.33 | 0.29 |
| | 30240 | 0.29 | 0.30 | 0.36 |
| | 32110 | 0.46 | 0.29 | 0.34 |
| *Differed between fiscal periods* | 32010 | --- | 0.27 | --- |
| | 31100 | 0.31 | --- | 0.35 |
| | 33230 | 0.40 | --- | 0.36 |
| | *Total "Good" Predictors* | *10* | *9* | *9*** |

**In total, 18 regulations were identified in the 2017 analysis (9 not listed here)

**Colour Legend**

Lower Fiene Score — Higher Fiene Score

*note: inspection data incomplete for 2019/20 fiscal period

## APPENDIX A: Background (adapted from the 2017 request memo)

The Fiene key indicator methodology is highlighted in a Federal Office of Child Care publication series on contemporary licensing highlights as part of a differential monitoring approach along with the risk assessment methodology. Key Indicators statistically predict or are predictor rules of overall compliance with all the rules for a particular service type[1].

The health protection department is looking to more efficiently track child and residential care compliance by monitoring the regulations that are the best predictors for the facilities in the Fraser Health authority. There are currently 271 regulations applicable to childcare facilities and 473 regulations applicable to residential facilities.

## APPENDIX B: Methodology (adapted from the 2017 request memo)

- An extract from Healthspace was provided by the Health Protection department containing all the monitored childcare and residential facilities inspections from April 1, 2017 to March 31, 2019 and whether they passed each individual regulation.
- Around 80% of facilities had more than one inspection during the two year study period. As a result, three approaches to selecting inspections for analysis were performed and compared:

| Approach | Rationale |
|---|---|
| **"First Inspection"**<br>Select only the first inspection in the study period | To replicate the methodology of the original analysis performed in 2017. Provides a more 'cross sectional' picture of compliance at the inspection level. |
| **"Most Violations"**<br>Select only the inspection with the most violations | Maintains independence of observations, and mitigates bias (see "Inspections Combined"). Compares compliance at the inspection level. |
| **"Inspections Combined"**<br>Combine all violations across all inspections for a given facility. | Summarizes compliance at the facility level. Consistent with the Fiene methodology whereby facilities are ranked to identify 'high compliance' vs. 'low compliance'. However, may introduce selection bias: facilities with multiple inspections may be more likely to have a greater number of regulations violated and thus receive a low compliance ranking. |

The following figure represents these three approaches visually:

**Selecting inspection for analysis**

Sample Dataset for Facility "A"

| FACILITY | INSPECTION (date) | REGULATIONS (violations = "X") | | | | |
|---|---|---|---|---|---|---|
| | | Reg1 | Reg2 | Reg3 | Reg 4 | Reg 5 |
| A | 1 | | X | | X | |
| A | 2 | X | | X | X | |
| A | 3 | | X | | | |

***SELECTED FOR FIENE ANALYSIS:***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **First Inspection:** | A | 1 | | X | | X | |
| **Most Violations:** | A | 2 | X | | X | X | |
| **Inspections Combined:** | A | n/a | X | X | X | X | |

- The facilities were sorted into quartiles (25%) based on their compliance across all the regulations. Only

1. Research Institute for Key Indicators. Technical Detail Updates to the Fiene Key Indicator Methodology, January 2015.

uded in

- Based on the results for the highest level and lowest level of facilities, the following matrix (Figure 1) was calculated for each individual regulation:

| **Figure 1** | ***Providers In Compliance on Rule*** | ***Programs Out Of Compliance on Rule*** | ***Row Total*** |
|---|---|---|---|
| ***Highest level (top 20-25%)*** | ***A*** | ***B*** | ***Y*** |
| ***Lowest level (bottom 20-25%)*** | **C** | **D** | ***Z*** |
| ***Column Total*** | ***W*** | ***X*** | ***Grand Total*** |

- The Fiene key indicator coefficient was then calculated for each regulation based on the following formula: $\phi=((A*D)-(B*C)) \div \sqrt{W*X*Y*Z}$

- The Fiene coefficient for each regulation was categorized based on figure 2. All the regulations that were in the range of being good predictors were kept and summarized in the results.

**Figure 2: Thresholds for the Fiene Key Indicators for Licensing Rules**

| Key Indicator Range | Characteristic of Indicator | Decision |
|---|---|---|
| **(+1.00) – (+.26)** | **Good Predictor** | **Include** |
| **(+.25) – (-.25)** | **Unpredictable** | **Do not Include** |
| **(-.26) – (-1.00)** | **Terrible Predictor** | **Do not Include** |

- SAS and Microsoft Excel were used for these analyses.

**Contact Hours as a New Metric Replacing Group Size and Staff-Child Ratios as well as a New Metric for COVID19 Thresholds**

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**Washington Department of Children, Youth and Families**

**May 2021**

The purpose of this paper is to propose Contact Hours as a new metric replacing staff child ratios and group size as well as using it as a new threshold measure for COVID19 thresholds. This paper will attempt to validate the key parameters for testing out the Contact Hour (CH) methodology in a series of facilities to determine its efficacy. The pilot validation study will determine if this CH methodology has any merit in being able to measure regulatory compliance with adult-child ratios. Since monitoring of facilities will not be occurring during the COVID19 pandemic are there ways to measure the research question in the previous sentence. Yes there is and it is based upon the Contact Hour (CH) methodology and involves asking the following six questions (The six questions should be asked of each grouping that is defined by a classroom or a well-defined group within each classroom tied to a specific adult-child ratio.):

1. **When does your first teaching staff arrive or when does your facility open (TO1)?**
2. **When does your last teaching staff leave or when does your facility close (TO2)?**
3. **Number of teaching/caregiving staff (TA)?**
4. **Number of children on your maximum enrollment day (NC)?**
5. **When does your last child arrive (TH1)?**
6. **When does your first child leave (TH2)?**

After getting the answers to these questions, the following formulae can be used to determine contact hours (CH) based upon the relationship between when the children arrive and leave (TH) and how long the facility is open (TO):

$$(1)\ CH = ((NC\ (TO + TH)) / 2) / TA;$$

$$(2)\ CH = (NC \times TO) / TA;$$

$$(3)\ CH = ((NC \times TO) / 2) / TA;$$

$$(4)\ CH = (NC^2) / TA$$

***Where: CH = Contact Hours; NC = Number of Children; TO = Total number of hours the facility is open (TO2 - TO1); TA = Total number of teaching staff, and TH = Total number of hours at full enrollment (TH2 - TH1).***

By knowing the number of contact hours (CH) it will be possible to rank order the exposure time of adults with children. Theoretically, this metric could then be used to determine that the greater contact hours is correlated with the increased non-regulatory compliance with adult-child ratios as determined in the below table on page 2.

**Table 1: Contact Hour (CH) Conversion Table (RS Model(1.0)) (Fiene, 2020©)**

**Taking into Account Exposure Time and Density**

**Group Size, Staff Child Ratio, Number of Children and Staff**

**<------------------- *Adult-Child Ratios (Relatively Weighted Contact Hours)* --------------->**

| **NC** | **CH** | **1:1** | **2:1** | **3:1** | **4:1** | **5:1** | **6:1** | **7:1** | **8:1** | **9:1** | **10:1** | **11:1** | **12:1** | **13:1** | **14:1** | **15:1** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 8 | **8** | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **2** | 16 | **8** | **16** | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| **3** | 24 | **8** | 12 | **24** | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| **4** | 32 | **8** | **16** | 16 | **32** | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| **5** | 40 | **8** | 13 | 20 | 20 | **40** | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| **6** | 48 | **8** | **16** | **24** | 24 | 24 | **48** | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 |
| **7** | 56 | **8** | 14 | 19 | 28 | 28 | 28 | **56** | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 |
| **8** | 64 | **8** | **16** | 21 | **32** | 32 | 32 | 32 | **64** | 64 | 64 | 64 | 64 | 64 | 64 | 64 |
| **9** | 72 | **8** | 14 | **24** | 24 | 36 | 36 | 36 | 36 | **72** | 72 | 72 | 72 | 72 | 72 | 72 |
| **10** | 80 | **8** | **16** | 20 | 27 | **40** | 40 | 40 | 40 | 40 | **80** | 80 | 80 | 80 | 80 | 80 |
| **11** | 88 | **8** | 15 | 22 | 29 | 29 | 44 | 44 | 44 | 44 | 44 | **88** | 88 | 88 | 88 | 88 |
| **12** | 96 | **8** | **16** | **24** | **32** | 32 | **48** | 48 | 48 | 48 | 48 | 48 | **96** | 96 | 96 | 96 |
| **13** | 104 | **8** | 15 | 21 | 26 | 35 | 35 | 52 | 52 | 52 | 52 | 52 | 52 | **104** | 104 | 104 |
| **14** | 112 | **8** | **16** | 22 | 28 | 37 | 37 | **56** | 56 | 56 | 56 | 56 | 56 | 56 | **112** | 112 |
| **15** | 120 | **8** | 15 | **24** | 30 | **40** | 40 | 40 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | **120** |
| **16** | 128 | **8** | **16** | 21 | **32** | 32 | 43 | 43 | **64** | 64 | 64 | 64 | 64 | 64 | 64 | 64 |
| **17** | 136 | **8** | 15 | 23 | 27 | 34 | 45 | 45 | 45 | 68 | 68 | 68 | 68 | 68 | 68 | 68 |
| **18** | 144 | **8** | **16** | **24** | 29 | 36 | **48** | 48 | 48 | **72** | 72 | 72 | 72 | 72 | 72 | 72 |
| **19** | 152 | **8** | 15 | 22 | 30 | 38 | 38 | 51 | 51 | 51 | 76 | 76 | 76 | 76 | 76 | 76 |
| **20** | 160 | **8** | **16** | 23 | **32** | **40** | 40 | 53 | 53 | 53 | **80** | 80 | 80 | 80 | 80 | 80 |
| **21** | 168 | **8** | 15 | **24** | 28 | 34 | 42 | **56** | 56 | 56 | 56 | 84 | 84 | 84 | 84 | 84 |
| **22** | 176 | **8** | **16** | 22 | 29 | 35 | 44 | 44 | 59 | 59 | 59 | **88** | 88 | 88 | 88 | 88 |
| **23** | 184 | **8** | 15 | 23 | 31 | 37 | 46 | 46 | 61 | 61 | 61 | 61 | 92 | 92 | 92 | 92 |
| **24** | 192 | **8** | **16** | **24** | **32** | 38 | **48** | 48 | **64** | 64 | 64 | 64 | **96** | 96 | 96 | 96 |
| **25** | 200 | **8** | 15 | 22 | 29 | **40** | 40 | 50 | 50 | 67 | 67 | 67 | 67 | 100 | 100 | 100 |
| **26** | 208 | **8** | **16** | 23 | 30 | 35 | 42 | 52 | 52 | 69 | 69 | 69 | 69 | **104** | 104 | 104 |
| **27** | 216 | **8** | 15 | **24** | 31 | 36 | 43 | 54 | 54 | **72** | 72 | 72 | 72 | 72 | 108 | 108 |
| **28** | 224 | **8** | **16** | 22 | **32** | 37 | 45 | **56** | 56 | 56 | 75 | 75 | 75 | 75 | **112** | 112 |
| **29** | 232 | **8** | 15 | 23 | 29 | 39 | 46 | 46 | 58 | 58 | 77 | 77 | 77 | 77 | 77 | 116 |
| **30** | 240 | **8** | **16** | **24** | 30 | **40** | **48** | 48 | 60 | 60 | 80 | 80 | 80 | 80 | 80 | **120** |

This table is based upon the assumptions that the child care is 8 hours in length (TO) and that the full enrollment is present for the full 8 hours (TH). This is unlikely to ever occur but it gives us a reference point to measure adult child contact hours in the most efficient manner. Based upon the relationship between TO and TH based upon the algorithms, select from one of the formulae from the previous page (formulae 1 - 4) to determine how well the actual Relatively Weighted Contact Hours (RWCH) match with this table. If the RWCH exceed the respective RWCH in this table, then the facility would be over ratio on ACR standards, in other words, they would be overpopulated.

**(RS Model = 1.0)**

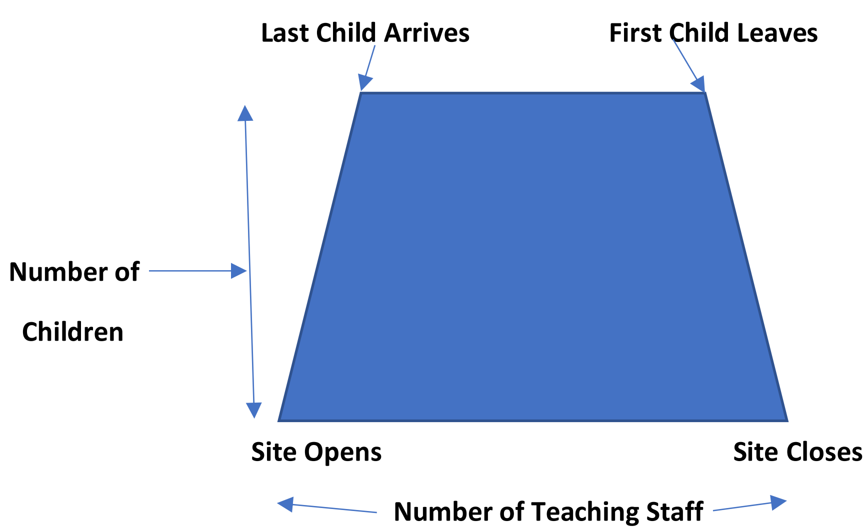
**(TT Model = 0.5)**

**Sample/Data Collection Methods**

Child care attendance data was explored and collected in partnership with the Washington State Department of Children, Youth, and Families (DCYF). A convenient sample of center and school age providers was initially identified through the use the state subsidy electronic payment system. All providers who accept Working Connections Child Care subsidies are required to use and track child attendance using an electronic attendance system. Providers may use and electronic sign in and out system provided by the state or opt to use another system. For this validation process, the sample was identified from the attendance tracking system provided and operated by DCYF and was inclusive of providers who use the system to track attendance of both subsidy and private pay children. The search resulted in approximately 100 providers within the State of Washington who have opted to use the electronic check-in system for all children regardless of payment type.

The sample was prioritized by identifying a single week since the Covid-19 outbreak began and from there the highest attendance day for that week was chosen for each provider. From this narrowed data set, it was determined the exact time the last child for the chosen day checked in, when the first child left, how many children were in attendance that day and the regular operating hours of the center or school age program. Because the attendance tracking system does not also track staffing attendance, it was necessary to contact each provider by phone in order to gather data inclusive of when the first staff arrived and when the last staff left and the total staff working that day. All responses were voluntary. Additionally, providers confirmed operating hours (many had been temporarily adjusted due to lowered demand during the gubernatorial stay at home order). Finally, providers reported if a child or staff member had tested positive for Covid-19. Of the 100 phone calls, the final sample was inclusive of 88 licensed providers statewide. Twelve providers either did not answer the call or opted to not answer the questions.

**Figure 1: Contact Hour Diagram Paradigm and Schematic**




The above diagram (Figure 1) depicts how the number of staff and children help to construct the contact hour formula. Depending on when the children arrive and leave could change the shape from a trapezoid to a rectangle or square or triangle. Please see the following potential density distributions which could impact these changes in the above contact hour diagram (Figure 1).

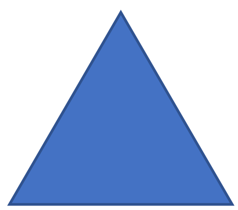
**Potential Density Distributions**
**Taking into Account Number of Children, Staff, and Exposure Time**

Here are some basic key relationships or elements related to the Contact Hour (CH) methodology.

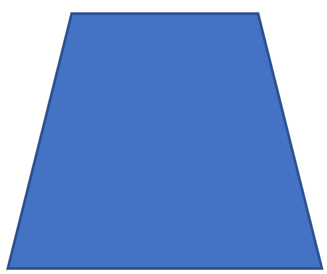
- RWCH = ACR
- CH = GS = NC
- NC and CH are highly correlated
- ACR and GS are static, not dynamic
- CH makes them dynamic by making them 2-D by adding in Time (T)
- ΣACR = GS
- GS = total number of children NC
- ACR = children / adult

*ACR = Adult Child Ratio, GS = Group Size, RWCH = Relatively Weighted Contact Hours, NC = Number of Children.*

<u>Possible Density Displays of Contact Hours (Horizontal Axis = Time (T); Vertical Axis = NC):</u>



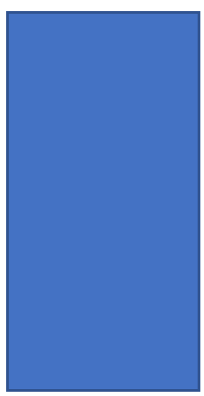
This density distribution should result in the lowest CH but probably not very likely to occur. Essentially what would happen is that full enrollment would be a single point which means that the last child arrives when the first child is leaving. Very unlikely but possible. (TT Model Reference(0.5))



This density distribution is probably the most likely scenario when it comes to CH in which the children gradually, albeit rather steeply, arrive at the facility and also leave the facility gradually. They don't all show up at the same time nor leave at the same time. However, the arriving and leaving will be a rather close time frame. (TT Model)

This scenario is unlikely but is used as the reference point for CH because it provides the most efficient model.  This is where all the children arrive and leave at the same time.  Very unlikely, but I guess it could happen.  The important element here is its efficiency in that all contact hours are covered, so although a lesser amount of CH is not as efficient it does demonstrate compliance with ACR and GS which is one of the purposes of CH.  As the bottom two distributions will demonstrate, CHs above this level would either depict a program that is open for an extended time or where there are too many children present and the facility is out of compliance with GS and/or ACR. (RS Model Reference(1.0))

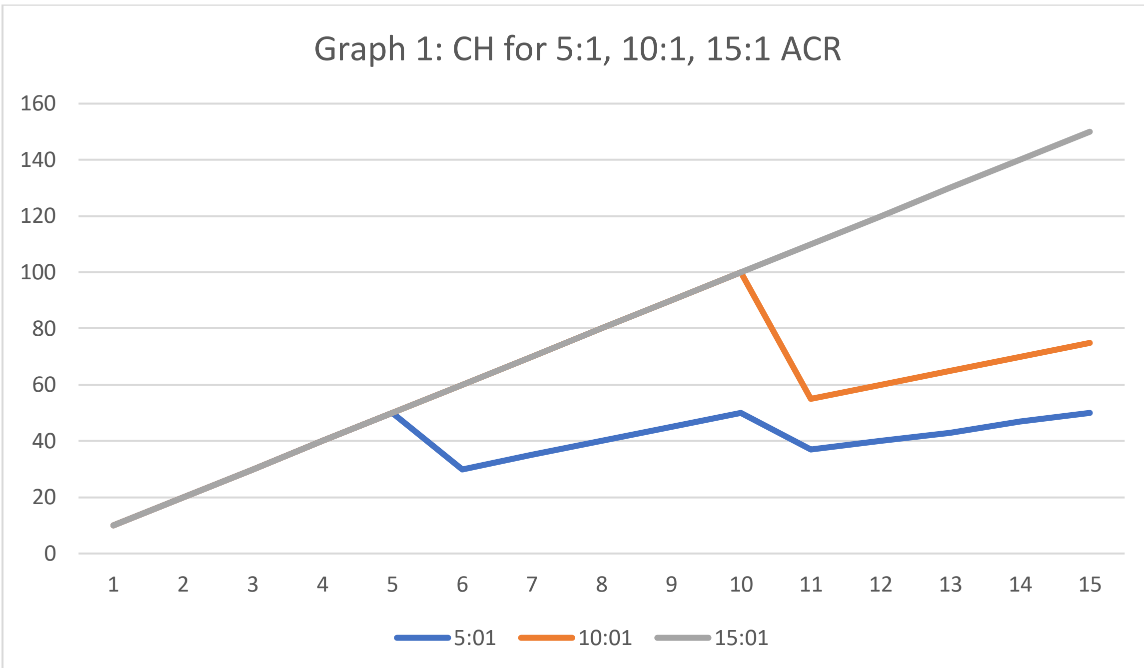
This distribution would indicate that the facility is open for an extended time and exceeds the number of total CH as depicted in the reference square standard.  Although not out of compliance with GS or ACR, this could become a determining factor when looking at the potential overall exposure of adults and children when we are concerned about the spread of an infectious diseases, such as what happened with COVID19.  Are facilities that high CH because of a scenario distribution of this type more prone to the spread of infectious diseases? (RS Model)



This depiction clearly indicates a very high CH and non-compliance with ACR and GS.  This is the reason for designing the CH methodology which was to determine these levels of regulatory compliance as its focus. (RS Model)

There is some overlap in the RWCH (Table 1 on page 2) in moving across the various levels, that occurs because of the change in group size (GS) where an overall group size (GS) could influence the overall CH by increasing NC.

The below graph (Graph 1) depicts the contact hours (CH) for three different adult to child ratios (ACR) 5:1, 10:1 and 15:1 to demonstrate the relationship between CH & ACR as the number of children (NC) increases.  CH is along the vertical axis, with NC along the horizontal axis.

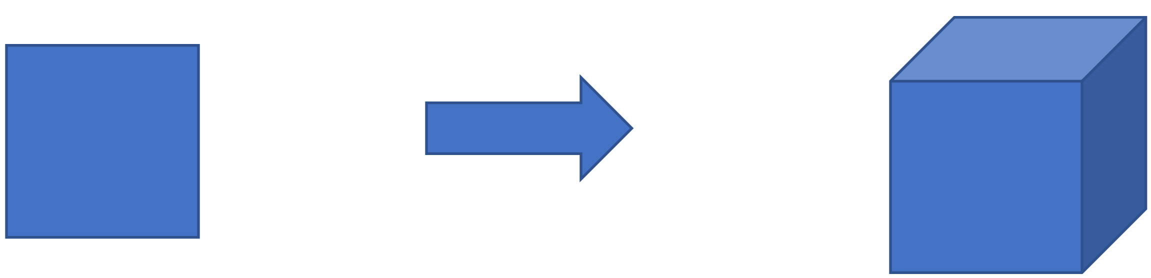



This graphic (Graph 1) depicts how with the addition of staff, the CH drop off accordingly.

*****************************************

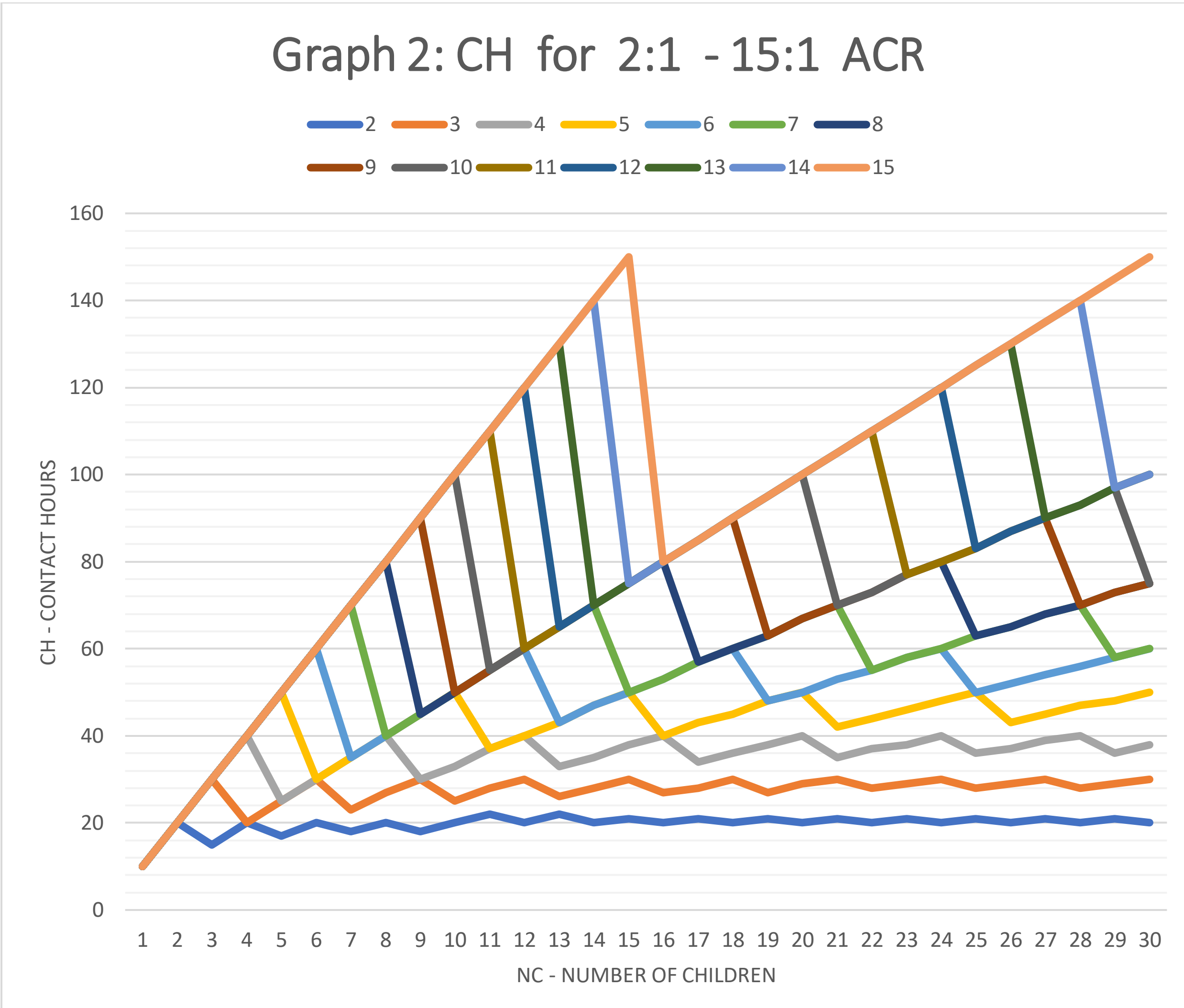
A possible extension or the next level to the CH methodology is to move from 2-D to 3-D and make the CH block format rather than area format.  It could be used to describe the trilemma of accessibility, affordability and quality more fully.  It could be a means for determining the unit cost at a much finer level and could then be used to make more informed decisions about the real cost of services.

Or another way of moving to 3-D is to include the square footage of the classroom or facility which would then provide a space metric along with time exposure and density metrics.



The move from 2-D (GS, ACR) to 3-D (GS, ACR, Quality or SQFT) and its potential impacts on the density distributions. Utilizing SQFT as a distancing/space dimension does help to mitigate the increased CH.

The following graph (Graph 2) depicts the Contact Hours (CH) for all the various Adult-Child ratios (ACR) in the Table on page 2 of this paper and how CH change with the number of children (NC).




From the above graph (Graph 2) it clearly shows how CHs vary with the number of children present. Please note the various slopes of the respective lines for each of the ACRs. As can be seen, once the lines begin to fluctuate, the CHs are entering into a zone of higher rate of exposure based on the ACRs. This demonstrates that the lower the ratio the more stable the CH line.

This is a listing of the algorithms for determining which formula (1-4 from page 1) & which model (RS or TT) to use in order to calculate the Contact Hours (CH). NC = Number of Children; TO = Total number of hours facility is open; TH = Total number of hours at full enrollment; TA = Total number of adult staff:

**If TO = TH = NC, then (NC x TO)/TA = CH (RS Model)**

**If TH < TO, then ((NC (TO + TH))/2)/TA = CH; or If TH = 0, then ((NC x TO)/2)/TA = CH (TT Model)**

**If TO = TH < NC, then (NC x TH)/TA = CH (RS Model)**

**If TO = TH > NC, then (NC x TO)/TA = CH (RS Model)**

Based upon the Washington State data, the Contact Hour methodology was validated in being able to act as a screener with those programs that would have exceeded the required staff child ratios. As can be seen through the data the more contact hours a staff person has with more children increases the probability of infection rates; when educators spend less time with lower amounts of children there is a lower chance of infection and vice versa. These data demonstrate how this methodology was used to assist in predicting appropriate child to adult ratios during an outbreak or pandemic by identifying safety thresholds of adult child ratios in licensed early learning facilities. The following spreadsheet plays out several scenarios with the actual data from Washington State early learning sites. For individuals interested in using the below spreadsheet in their respective jurisdiction, please contact the authors for the actual templates[1].

This provides evidence to support the use of this methodology in determining staff child ratio virtually as well as identifying when those ratios allow for in-person inspections or indicate when it is more appropriate to conduct virtual inspections. The authors do want to caution licensing administrators in that the results from this methodology is not to substitute for on-site observations when they are possible. It is intended as a screening tool to determine in a very overarching way how to target limited observational visits. The methodology is based upon statistical probabilities which have demonstrated in this pilot study to be highly reliable and valid but they are not full proof. So with any programs where there is any doubt, the agency should follow up with a direct observational inspection. Finally, agencies may want to consider using medical and geographical outbreak data in conjunction with this methodology to refine the results given the unique nature of the various infectious diseases.

In using the actual data from Washington State in the following spreadsheet, please note that the potential spread of the virus is mitigated the most greatly in the results in Green while Yellow and Red provide less mitigation and begin to place the adults and children at greater risk. Examples are provided for both the RS (1.0) and TT (0.5) Models

As a footnote to this study, a follow-up is to introduce distance/spacing via square footage (SQFT) to the Contact Hour formula. The results indicate a significant mitigation effect on increased Contact Hours when the available square footage is increased. This addition will be used in future studies to ascertain its relative impact on the Contact Hour formulas as indicated in the following revision.

**CH2 = (((NC (TO + TH)) / 2) / TA) / (SQFT);**

**CH2 = ((NC x TO) / TA) / (SQFT);**

**CH2 = (((NC x TO) / 2) / TA) / (SQFT);**

**CH2 = ((NC$^2$) / TA) / (SQFT)**

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**Contact Hour Infection Rate Threshold Grid**

**Richard Fiene, Ph.D.**

**December 2020**

**The below grid provides the potential contact hour infection rate thresholds when we compare the amount of time and the number of individuals in a particular area. It is color coded moving from Blue to Red. Blue indicates the lowest threshold = 0 since there is no contact with anyone, in other words the person is alone by themselves. The contact hours go up as the time increases and the number of individuals increases. The higher the contact hours and the greater the chance of the infection spreading. It is being suggested that contact hours be used rather than the group size because contact hours takes the number of individuals into account (Vertical Axis) as well as the amount of time (Horizontal Axis) they are together.**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| High | 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| | 9 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| | 8 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| | 7 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 |
| | 6 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| Num | 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| | 4 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| | 3 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| | 2 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| Low | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | <---- | Time | ----> | | | | |

**The lower the contact hours, the better because it obviously decreases the chances of the spread of infection. The Green and Yellow demonstrate this while the Orange and Red contact hours do not and should be avoided. These levels could be used to advise group gatherings related to the potential spread of the COVID19 Virus which may be more effective than just addressing group size.**

**Regulatory Compliance Key Indicator Metric and Matrix Update/Revision Technical Research Note**

**Richard Fiene, Ph.D.**

**January 2023**

Over the past decade in doing research on the Regulatory Compliance Key Indicator Metric (RCKIm) it has become very clear that false negatives needed to be controlled for because of their potential to increase morbidity and mortality. When dealing with regulatory compliance and full compliance as the threshold for the high grouping variable in the 2 x 2 Regulatory Compliance Key Indicator Matrix (RCKIM)(see matrix below), false negatives could be either eliminated or reduced to the point of no concern.

However, in the event that substantial compliance rather than full compliance is used as the thresh old for the high grouping variable in the 2 x 2 Regulatory Compliance Key Indicator Matrix (RCKIM) this becomes a problem again. There is the need to introduce a weighting factor.

In utilizing the RCKIm, the following equation/algorithm is used to produce the Fiene Coefficient (FC):

**FC = ((A)(D)) – ((B)(C)) / sqrt (WXYZ)**

This RCKIm needs to be revised/updated to the following in order to take into account the need to again eliminate false negatives being generated by the results of the equation/algorithm; this can be accomplished by cubing B:

**FC* = ((A)(D)) – ((B^3)(C)) / sqrt (WXYZ)**

By this simple adjustment to cube (B) it will basically eliminate the use of any results in which a false negative occurs when substantial compliance is determined. The table below displays the variables of the Regulatory Compliance Key Indicator Matrix (RCKIM).

| RCKIM | High RC Group | RC Low Group | Totals |
|---|---|---|---|
| KI In Compliance | A | B^3 | Y |
| KI Violations | C | D | Z |
| Totals | W | X | |

Regulatory Compliance Key Indicator Matrix (RCKIM)

In the above examples, FC can be used when the High RC Group is at full regulatory compliance, but FC* needs to be used when the High RC Group is including substantial as well as full regulatory compliance. By using both equations/algorithms, it better deals with the results of the Regulatory Compliance Theory of Diminishing Returns.

The results should clearly show that only positive (+) coefficients will become Regulatory Compliance Key Indicators versus those rules that do not show any relationship to overall regulatory compliance (0), but now the negative (-) coefficients will more clearly show when any false negatives appear and clearly not include them as Regulatory Compliance Key Indicators. This is a major improvement in the Regulatory Compliance Key Indicator methodology which clearly demonstrates the differences in the results. It provides a gateway in those regulatory compliance data distributions where substantial regulatory compliance is heavily present while full regulatory compliance is not. This could become a problem as the regulatory science field moves forward with the use of the Regulatory Compliance Theory of Diminishing Returns. Below are some data displays to support this revision/update:

*RCKIM: Regulatory Compliance Key Indicator Metric (Fiene, 2023)*

| A | B | C | D | E | F | G | H | I | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 24 | 30 | 26 | 44 | 56 | 50 | 50 | 520 | 720 | 6160000 | 2481.934729 | -200 | -0.080582 |
| 20 | 0 | 30 | 26 | 20 | 56 | 50 | 26 | 520 | 0 | 1456000 | 1206.64825 | 520 | 0.430946 |
| 20 | 1000 | 30 | 26 | 1020 | 56 | 50 | 1026 | 520 | 30000 | 2.93E+09 | 54131.83906 | -29480 | -0.544596 |
| 20 | 1 | 30 | 26 | 21 | 56 | 50 | 27 | 520 | 30 | 1587600 | 1260 | 490 | 0.388889 |
| 20 | 24 | 1000 | 26 | 44 | 1026 | 1020 | 50 | 520 | 24000 | 2.3E+09 | 47982.7469 | -23480 | -0.489343 |
| 20 | 0 | 0 | 26 | 20 | 26 | 20 | 26 | 520 | 0 | 270400 | 520 | 520 | 1 |
| 0 | 24 | 30 | 0 | 24 | 30 | 30 | 24 | 0 | 720 | 518400 | 720 | -720 | -1 |
| 25 | 25 | 25 | 25 | 50 | 50 | 50 | 50 | 625 | 625 | 6250000 | 2500 | 0 | 0 |
| 20 | 5 | 30 | 26 | 25 | 56 | 50 | 31 | 520 | 150 | 2170000 | 1473.091986 | 370 | 0.251172 |
| 20 | 5 | 10 | 26 | 25 | 36 | 30 | 31 | 520 | 50 | 837000 | 914.8770409 | 470 | 0.51373 |
| 20 | 24 | 30 | 6 | 44 | 36 | 50 | 30 | 120 | 720 | 2376000 | 1541.427909 | -600 | -0.389249 |
| 10 | 24 | 30 | 6 | 34 | 36 | 40 | 30 | 60 | 720 | 1468800 | 1211.940593 | -660 | -0.544581 |

**Variables Reference**

*Excel = RCKIM Variables*

| | |
|---|---|
| a=a | OK |
| b=b | False Negative (-) |
| c=c | False Positive (+) |
| d=d | OK |
| e=a+b | |
| f=c+d | |
| g=a+c | |
| h=b+d | |
| i=a*d | |
| j=b*c | |
| k=w*x*y*z | |
| l=sqrt wxyz | |
| m=(a*d)-(b*c) | |
| n=fc | +=OK |
| | 0=Random |
| | -=NULL |

*Regulatory Compliance Key Indicator Equations/Algorithms and 2 x 2 Matrix:*

fc = ((a*d) - (b*c)) / sqrt wxyz — Full Regulatory Compliance

fc* = ((a*d) - ((b^3*c)) / sqrt wxyz — Substantial Regulatory Compliance

| | | |
|---|---|---|
| A | B^3 | W |
| C | D | X |
| Y | Z | RCKIMatrix |

*(Fiene (2023). Regulatory Compliance Key Indicator Metric & Matrix. Research Institute for Key Indicators, Etown, PA.)*

| A | B | C | D | E | F | G | H | I | J | K | L | M | N=FC | B^3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 1 | 50 | 20 | 21 | 70 | 70 | 21 | 400 | 50 | 2160900 | 1470 | 350 | 0.238095 | 1 |
| 20 | 2 | 50 | 20 | 22 | 70 | 70 | 22 | 400 | 100 | 2371600 | 1540 | 300 | 0.194805 | 8 |
| 20 | 3 | 50 | 20 | 23 | 70 | 70 | 23 | 400 | 150 | 2592100 | 1610 | 250 | 0.15528 | 27 |
| 20 | 4 | 50 | 20 | 24 | 70 | 70 | 24 | 400 | 200 | 2822400 | 1680 | 200 | 0.119048 | 64 |
| 20 | 5 | 50 | 20 | 25 | 70 | 70 | 25 | 400 | 250 | 3062500 | 1750 | 150 | 0.085714 | 125 |
| 20 | 6 | 50 | 20 | 26 | 70 | 70 | 26 | 400 | 300 | 3312400 | 1820 | 100 | 0.054945 | 216 |
| 20 | 0 | 50 | 20 | 20 | 70 | 70 | 20 | 400 | 0 | 1960000 | 1400 | 400 | 0.285714 | 0 |
| 20 | 0 | 40 | 20 | 20 | 60 | 60 | 20 | 400 | 0 | 1440000 | 1200 | 400 | 0.333333 | 0 |
| 20 | 10 | 40 | 20 | 30 | 60 | 60 | 30 | 400 | 400 | 3240000 | 1800 | 0 | 0 | 1000 |
| 20 | 11 | 40 | 20 | 31 | 60 | 60 | 31 | 400 | 440 | 3459600 | 1860 | -40 | -0.021505 | 1331 |

| A | B^3 | C | D | A+B | C+D | A+C | B+D | A*D | B*C | WXYZ | sqrtWXYZ | (A*D)-(B*C) | FC* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 1 | 50 | 20 | 21 | 70 | 70 | 21 | 400 | 50 | 2160900 | 1470 | 350 | 0.238095 |
| 20 | 8 | 50 | 20 | 28 | 70 | 70 | 28 | 400 | 400 | 3841600 | 1960 | 0 | 0 |
| 20 | 27 | 50 | 20 | 47 | 70 | 70 | 47 | 400 | 1350 | 10824100 | 3290 | -950 | -0.288754 |
| 20 | 64 | 50 | 20 | 84 | 70 | 70 | 84 | 400 | 3200 | 34574400 | 5880 | -2800 | -0.47619 |
| 20 | 125 | 50 | 20 | 145 | 70 | 70 | 145 | 400 | 6250 | 1.03E+08 | 10150 | -5850 | -0.576355 |
| 20 | 216 | 50 | 20 | 236 | 70 | 70 | 236 | 400 | 10800 | 2.73E+08 | 16520 | -10400 | -0.62954 |
| 20 | 0 | 50 | 20 | 20 | 70 | 70 | 20 | 400 | 0 | 1960000 | 1400 | 400 | 0.285714 |
| 20 | 0 | 40 | 20 | 20 | 60 | 60 | 20 | 400 | 0 | 1440000 | 1200 | 400 | 0.333333 |
| 20 | 1000 | 40 | 20 | 1020 | 60 | 60 | 1020 | 400 | 40000 | 3.75E+09 | 61200 | -39600 | -0.647059 |
| 20 | 1331 | 40 | 20 | 1351 | 60 | 60 | 1351 | 400 | 53240 | 6.57E+09 | 81060 | -52840 | -0.651863 |

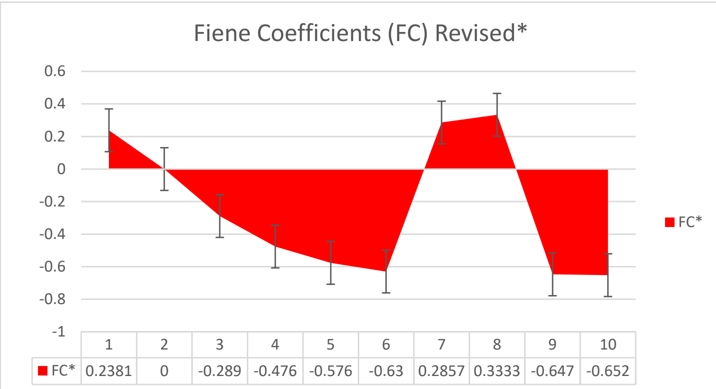



Chart 1: Revised/Updated Fiene Coefficients

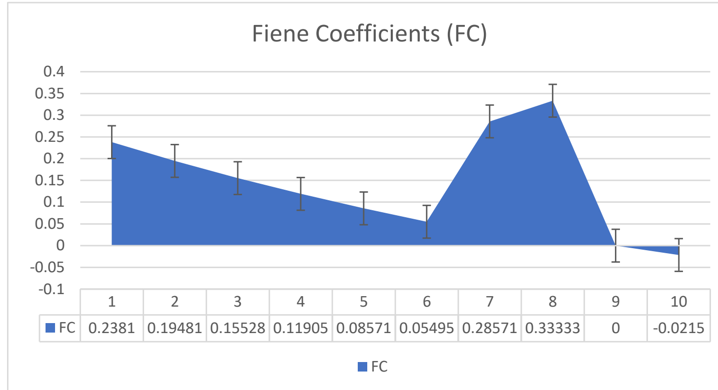
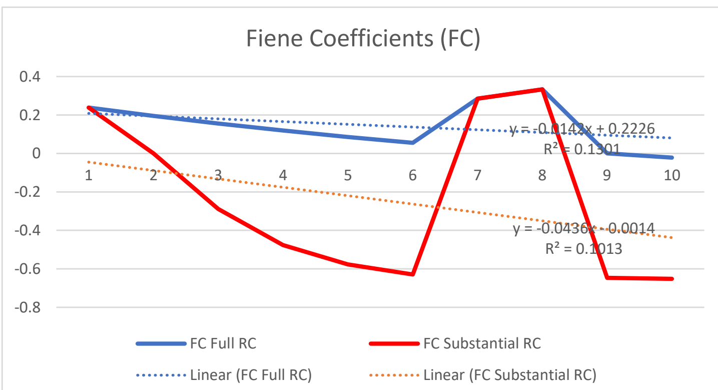



Chart 2: Standard Fiene Coefficients

**It is clear from the above two charts that the revised/updated Fiene Coefficients take the risk factor more into account than the standard Fiene Coefficient.**
**Using Chart 1 will be a more effective and efficient methodology to determing the regulatory compliance key indicators, especially when substantial compliance is utilized in determining the high regulatory compliant group. Chart 1 utilizies a weighting factor while that is not the case in Chart 2.**
**When full compliance is utilized in determining the high regulatory compliance group than Chart 2: Standard Fiene Coefficients is sufficient.**




| | | |
|---|---|---|
| 0.238095 | 0.238095 | 1 |
| 0.194805 | 0 | 2 |
| 0.15528 | -0.288754 | 3 |
| 0.119048 | -0.47619 | 4 |
| 0.085714 | -0.576355 | 5 |
| 0.054945 | -0.62954 | 6 |
| 0.285714 | 0.285714 | 7 |
| 0.333333 | 0.333333 | 8 |
| 0 | -0.647059 | 9 |
| -0.021505 | -0.651863 | 10 |
| | | |
| FC Full | FC Subst | Pairings |

**Chart 3: Fiene Coefficients side by side for full regulatory compliance and substantial regulatory compliance.**

**FC for substantial regulatory compliance clearly demonstrates the effectiveness and efficiency of the revised and updated Regulatory Compliance Key Indicator Metric.**
**It eliminates any potential key indicator that has significant false negatives present within the Regulatory Compliance Key Indicator Matrix.**
**It should be noted the perfect match on the 7th and 8th pairing when there are not any false negatives present.**