

The CH+ Scoring Protocol (β Version): A Comprehensive Methodology for Evaluating Compliance and Quality

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Abstract

This article introduces the beta version of the CH+ Scoring Protocol, a comprehensive mathematical model designed to quantify compliance and program quality within early care and education regulatory systems. The protocol integrates Program Quality Indicators (PQI) and Regulatory Weighting/Compliance History (RWCH), while applying risk-stratified reduction factors for foundational and risk-based non-compliances. The scoring thresholds and application examples are presented to demonstrate how differential weighting distinguishes between low, provisional, and high-quality providers. By modularizing the base score and reduction multipliers, this paper presents a mathematically rigorous and scalable approach to compliance evaluation.

1 Introduction

The ongoing evolution of regulatory science necessitates robust methodologies that move beyond binary compliance checks to nuanced, differentially weighted scoring protocols. The CH+ Scoring Protocol (β Version) addresses this by synthesizing key indicators, risk assessment rules, and quality metrics into a single, comprehensive score. This approach allows regulatory agencies to effectively categorize programs into actionable tiers ranging from denial to very high quality, ensuring a standardized, mathematically sound basis for evaluating human services and child care compliance.

2 Methodology and Formula Components

To ensure clarity, scalability, and mathematical rigor, the CH+ β protocol is structured modularly. The formula separates positive foundational metrics (the Base Score) from risk-based penalizations (Reduction Multipliers), which account for the severity and frequency of non-compliances.

2.1 The Base Score (S_{base})

The base score relies on two core variables weighted by their relative importance to program quality and historical compliance:

- **PQI (Quality Indicators from CCEEHM):** Ranges from +10 to +40. Weight multiplier: 3.
- **RWCH (ACR/GS Ratios and Group Size Compliance from CCEEHM):** Ranges from -20 to +20. Weight multiplier: 2.

The base score isolates the positive points before any penalties are applied:

$$S_{\text{base}} = 3 \sum \text{PQI} + 2 \sum \text{RWCH} \quad (1)$$

2.2 The Reduction Multipliers

Risk rules operate as step-down reduction factors. Instead of applying linear arithmetic subtraction, distinct multipliers (M) evaluate specific non-compliance thresholds using piecewise notation.

Foundational Compliance (M_{FC}): Evaluates Key Indicator Rules. A severe lack of foundational compliance results in a full nullification of the score.

$$M_{\text{FC}} = \begin{cases} 0 & \text{if FC} \leq -2 \\ 0.5 & \text{if FC} = -1 \\ 1 & \text{if FC} = 0 \end{cases} \quad (2)$$

High-Risk Rules ($M_{\text{F-}}$): Accounts for False Negatives in high-risk scenarios. Even a single occurrence warrants a full null reduction.

$$M_{\text{F-}} = \begin{cases} 0 & \text{if F-} \leq -1 \\ 1 & \text{if F-} = 0 \end{cases} \quad (3)$$

Low-Risk Rules ($M_{\text{F+}}$): Accounts for False Positives in low-risk scenarios, utilizing a graduated penalty system.

$$M_{\text{F+}} = \begin{cases} 0 & \text{if F+} \leq -3 \\ 0.67 & \text{if F+} \in \{-1, -2\} \\ 1 & \text{if F+} = 0 \end{cases} \quad (4)$$

2.3 The Final Equation

The final CH+ β score integrates the base quality metrics with the defined risk factors. The Base Score is multiplied by the applicable reduction factors:

$$\text{CH} + \beta = S_{\text{base}} \times (M_{\text{FC}} \times M_{\text{F-}} \times M_{\text{F+}}) \quad (5)$$

3 Scoring Tiers

The final calculated score determines the regulatory standing of the program:

- **Less than 30:** Low quality, Denial
- **30 – 70:** Medium quality, Provisional
- **71+:** High quality, Full compliance
- **90+:** Very High quality

4 Results: Applied Scoring Examples

The matrix below provides empirical examples of the CH+ Scoring Protocol in practice, illustrating the impact of various compliance and quality indicator combinations.

Table 1: CH+ β Scoring Matrix and Application Outcomes

PQI	RWCH	FC	F-	F+	SCORE	COMMENTS
40	10	0	0	0	140	Perfect score, full compliance/quality
30	0	0	0	0	90	High score, full compliance
20	0	-2	-1	0	0	Unacceptable score FC, F+, F-
40	10	0	0	-3	94	Substantial compliance with F+
40	10	-1	0	0	70	Medium score, KIM NC
10	-10	0	0	0	10	Very low-quality score, Denial
10	-20	0	0	0	-10	Very low score, Denial
10	-20	0	-1	0	0	Unacceptable score, Denial
20	0	0	0	0	60	Provisional
20	0	-1	0	0	30	Very low provisional level
20	0	0	0	-2	40	Medium + Substantial compliance
20	0	-1	0	-2	15	Denial based upon FC + F+ NCs

5 Discussion and Conclusion

The CH+ β scoring model provides a rigorous mathematical framework for regulatory agencies, enabling the differentiation of high-performing programs from those that present significant risks to health and safety. By explicitly separating the foundational compliance baselines from risk reduction multipliers, the modular format eliminates arithmetic ambiguity and allows for seamless integration into digital scoring systems and dashboards. The protocol effectively mitigates both false negatives and false positives in regulatory decision-making, ensuring a balanced, equitable, and data-driven approach to human services oversight.