

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:

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

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

CH+ Scoring Protocol (β)

Extended Reference Matrix — 500 Simulated Application Outcomes

Distribution Summary (n=500):

Very High Quality (90+): 82 | High Quality (71-89): 28 | Medium Quality / Provisional (30-70): 260 | Low Quality / Denial (<30): 130

PQI	RWCH	FC	F-	F+	SCORE	COMMENTS / CLASSIFICATION
20	-20	0	0	-1	13	Low Quality (Denial) — Reduced by F+ NC
30	10	0	0	0	110	Very High Quality
20	0	0	0	-1	40	Medium Quality (Provisional) — Reduced by F+ NC
20	0	0	0	0	60	Medium Quality (Provisional)
30	0	0	0	-3	0	Low Quality (Denial) — Nullified by F+ Non-Compliance
20	-10	0	0	-1	27	Low Quality (Denial) — Reduced by F+ NC
30	0	0	-1	0	0	Low Quality (Denial) — Nullified by F- Non-Compliance
20	10	0	0	0	80	High Quality
30	-20	0	0	0	50	Medium Quality (Provisional)
20	-10	0	0	0	40	Medium Quality (Provisional)
20	0	0	0	-1	40	Medium Quality (Provisional) — Reduced by F+ NC
20	-10	0	0	0	40	Medium Quality (Provisional)
40	0	0	0	-2	80	High Quality — Reduced by F+ NC
30	0	0	0	0	90	Very High Quality
20	10	-1	0	-1	27	Low Quality (Denial) — Heavily reduced by FC and F+ NCs
20	10	0	0	0	80	High Quality
20	0	0	0	0	60	Medium Quality (Provisional)
20	20	0	0	0	100	Very High Quality
10	0	0	0	0	30	Medium Quality (Provisional)
20	20	0	-1	-2	0	Low Quality (Denial) — Nullified by F- Non-Compliance
10	0	0	0	0	30	Medium Quality (Provisional)
20	-10	0	0	-3	0	Low Quality (Denial) — Nullified by F+ Non-Compliance
30	0	0	0	-2	60	Medium Quality (Provisional) — Reduced by F+ NC
30	0	0	0	0	90	Very High Quality