

RISK STRATIFICATION, SEGMENTATION, AND TIERING TRANSPARENCY DOCUMENT

SUMMARY

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RSST TRANSPARENCY SUMMARY

Introduction

This summary distills the key components and intent of the [RSST Transparency Document](#) (updated August 2026) published by the California Department of Health Care Services (DHCS). The revised RSST Transparency Document and this accompanying summary include the addition of the RSST birthing population models (RSST V1.1).

The purpose of this document is to provide an overview of how RSST works, what makes it unique, and why it represents a major step forward in proactive, data-driven, and equitable population health management across the state. It is intended to be accessible to readers of all statistical backgrounds.

RSST: California's Data Analytics Solution

California's Medi-Cal program is implementing a statewide approach called Risk Stratification, Segmentation, and Tiering (RSST) to better identify members who are at risk of poor health outcomes or not engaging in needed care. This approach is part of a broader Population Health Management (PHM) strategy aimed at improving equity, care coordination, and outcomes across the state.

RSST serves as a central component of [Medi-Cal Connect](#), a statewide data analytics solution designed to support population health management. The primary goal of RSST is to enable care teams and managed care plans (MCPs) to proactively identify and support members who are at risk *before* health problems escalate. The RSST approach¹ focuses on specific risk across three populations: adults, pediatrics, and birthing. It contains thirteen predictive models—five for adults, five for pediatrics, and three for birthing populations.

RSST's predictive capabilities help MCPs allocate resources more effectively, while its focus on equity ensures that unmet or overlooked needs—such as missed preventive visits, unmanaged behavioral health conditions, or housing instability—are effectively identified. This allows for targeted outreach and care coordination where support will have the greatest impact.

The system is built on four core principles:

- » **Standardization** across all MCPs to ensure consistency.
- » **Transparency** in how models are built and used.

- » **Equity**, with a focus on identifying and reducing disparities.
- » **Flexibility** to adapt to future policy changes without needing a full redesign.

Why RSST?

DHCS developed RSST to address current challenges in risk identification throughout the Medi-Cal delivery system, including inconsistent stratification methods across MCPs, reliance on fragmented or incomplete data, and a narrow focus on cost or utilization. Many existing models are proprietary and lack transparency, offer little attention to equity, and/or generate risk scores based on past events rather than future risk. These tools often treat all patient groups uniformly, without accounting for the diverse needs across populations, and are updated infrequently, limiting their responsiveness to changing circumstances.

RSST directly addresses these gaps by introducing a statewide, standardized method that applies to all Medi-Cal members, ensuring consistency and fairness across MCPs. The algorithm draws on centralized, comprehensive data from the Medi-Cal program, including sources not readily accessible to individual MCPs, such as social services eligibility and utilization information from other state agencies.

Algorithm Structure and Predictive Risk Tiering

The RSST approach uses advanced machine learning to analyze a wide range of Medi-Cal data—including claims, encounters, demographic information, enrollment history, and social drivers of health. RSST examines three risk domains for adults and children—adverse health events, underutilization, and social risk—and each domain has associated subdomains. Each subdomain has an associated algorithm identifies a member's risk tier in that subdomain. See [Appendix A](#) for a complete list of outcomes for adult and pediatric models.

Unlike the adult and pediatric models, the birthing models focus exclusively on the adverse events risk domain, which was split into three subdomains based on the type of adverse event and when it occurred: pregnancy, post-pregnancy physical, and post-pregnancy behavioral. Underutilization and social risk models were not developed specifically for the birthing population due to gaps in data on prenatal care utilization and anticipated key drivers of social risk. However, these members will have an underutilization and social risk tier assigned from their corresponding Adult or Pediatric population models. See [Appendix B](#) for a complete list of outcomes for birthing models.

Each month and based on data availability, the RSST approach predicts the likelihood that a member will experience negative health events or underuse essential services within the next year and assigns every adult and pediatric member to one of three risk tiers: low, medium-rising, or high. The birthing models include only two tiers—medium and high—reflecting existing DHCS policy to engage all pregnant members (i.e., no Medi-Cal pregnant member is considered “low risk”).

Risk tiers are defined as follows:

- » **Low Risk:** Low predicted need for intervention
- » **Medium-Rising Risk:** Emerging or moderate needs
- » **High Risk:** High predicted need or likelihood of adverse outcomes; requires further outreach and engagement.

If a member is high-risk in any single subdomain, they are categorized as high-risk overall, ensuring that significant needs are not overlooked, even if they are concentrated in a single domain. For birthing members, subdomains roll up to the overall Birthing domain only when there is a confirmed pregnancy-related claim, and the overall Birthing domain does not roll up to the overall RSST risk tier at V1.1 launch. Because DHCS’s claim information lags behind provider and MCP awareness of a member’s pregnancy, DHCS provides Birthing risk tiers for all members who may potentially become pregnant each month. This approach ensures that MCPs can reference these members’ risk tiers as soon as they become aware of pregnancies. Birthing members fully overlap the adult or pediatric populations and may also be independently flagged as high-risk by any of those RSST V1 models. Member tiers are generated monthly based on updated data, ensuring that care teams have up-to-date insights to guide interventions.

Table 1a. RSST Adult and Pediatric Adverse Events Model Structure with Example Outcomes¹

Subdomain	Physical Health	Behavioral Health
Example Adult Outcomes	» Inpatient Admission » ED Visits	» New Diagnosis of Mental Illness » Psychiatric Admission

¹ For a complete list of adult and pediatric outcomes, see [Appendix A](#).

Subdomain	Physical Health	Behavioral Health
		» Psychiatric ED Visit
Example Pediatric Outcomes	» Morbidity » Inpatient Admission » New Diagnosis of Chronic Illness	» New Diagnosis of Mental Illness or SUD » Psychiatric Admission » Psychiatric ED Visit

Table 1b. RSST Adult and Pediatric Underutilization Model Structure with Example Outcomes

Subdomain	Physical Health	Behavioral Health
Example Adult Outcomes	» Primary Care Visits » Dental Care Visits » Medical or Pharmacy Claims	» Ambulatory MH or SUD Visits » MH/SUD-Related Medication Use
Example Pediatric Outcomes	» Well-Child Visits » Dental Care Visits » Medical or Pharmacy Claims	» PCP Visits with BH or SUD Diagnosis » MH/SUD-Related Visits » Follow-Up Visits

Table 1c. RSST Adult and Pediatric Social Risk Model Structure with Example Outcomes

Subdomain	Social Risk
Example Adult Outcomes	» Housing Instability
Example Pediatric Outcomes	» Housing Instability

Table 2. RSST Birthing Adverse Events Model Structure with Example Outcomes²

Subdomain	Pregnancy	Post-Pregnancy Physical	Post-Pregnancy Behavioral
Example Birthing Outcomes	» Gestational Diabetes Requiring Insulin » Unplanned Cesarean Section	» Post-Pregnancy Hemorrhage » Thromboembolism » Maternal or Infant Mortality	» Unintentional Drug Overdose or Intentional Self-Harm » Psychiatric ED Visit » Psychiatric Admission

Tiering Methodology

To select the most equitable and effective strategy for defining high-risk thresholds, DHCS evaluated three different tiering options:

1. **Equal Proportion Approach:** Flagging the same percentage of members as high-risk in each subdomain.
2. **Balanced Recall Approach:** Setting thresholds to ensure similar sensitivity (recall) for high-risk designation across all subdomains, thus capturing a consistent share of true outcomes in each area.
3. **Maximized Recall Approach:** Optimizing thresholds to maximize overall recall, favoring subdomains with stronger predictive performance.

Each strategy was assessed for technical performance, balance across risk types, equity in subgroup recall, potential benefits (e.g., identifying “net new” at-risk members), and operational impacts. Ultimately, DHCS chose Option 2 to balance recall (i.e., sensitivity) across all subdomains. This approach ensures that members at risk in any domain are identified consistently, regardless of the specific outcome or population subgroup.

Tiering Methodology for Birthing Models

Tiering for the birthing population required a modified approach compared to adult and pediatric models, reflecting both clinical priorities and existing policy requirements for birthing populations. DHCS identified the pregnancy/postpartum period as a central focus for the birthing tiering strategy for several reasons. First, DHCS

² For a complete list of birthing outcomes, see [Appendix B](#).

and clinical subject matter experts emphasized that [63% of maternal deaths](#) occur in this critical window. Second, given the natural lag in claims and other data, prediction of adverse events occurring during the post-pregnancy/postpartum period is more actionable for care management than prediction of adverse events occurring during the pregnancy period.

DHCS evaluated the three tiering options for the birthing population based on the merits of their technical performance, balance of risk types across pregnancy and post-pregnancy/postpartum periods, equity, and operational explainability. Based on this evaluation, DHCS selected the Balanced Recall Approach (Option 2) for the birthing population.

High-Risk Ceiling

Starting January 1, 2027, MCPs will be required to perform outreach and attempt to engage members identified by RSST as high risk. DHCS provides all MCPs risk tier information for each enrolled member on a monthly basis. To support implementation, DHCS established an initial high-risk tier ceiling, limiting the number of Medi-Cal members across the state who are classified as “high risk.” This ceiling is informed by policy guidance and stakeholder input and reflects what is operationally feasible for MCPs to manage. The percent limit is not applied at the MCP level, which may result in MCPs with different percentages of their membership appearing as high risk. In the future, DHCS will adjust the high-risk ceiling based on what is best for members and what MCPs can support operationally.

The birthing models were not subject to the top-down high-risk ceiling used for the adult and pediatric models in RSST V1. Instead, a data-informed reference point was derived from the observed prevalence of the three birthing outcome subdomains, resulting in an approximate 27% high-risk benchmark within the birthing population.

Distinctive Features

Dual Focus on Poor Outcomes and Underutilization: Unlike most traditional models that only flag high-cost or high-need individuals, RSST identifies members who are not using services they likely need—a sign of hidden or unmet needs for health care and social services. RSST’s dual focus on poor outcomes and underutilization is essential for surfacing gaps in care that might otherwise remain invisible, supporting proactive and equitable intervention. For the birthing population, members receive three

additional risk tiers focused exclusively on adverse events due to data limitations with prenatal care billing and measurement.

RSST's underutilization measures identify members who, based on their health conditions and recent interactions with Medi-Cal, are at highest risk for not receiving needed follow-up or preventive services. For these measures, the denominator includes members who have recently engaged with the health care system and have a diagnosis that requires an outpatient follow-up within the next 12 months. It also includes members who are likely to require dental care or pharmacotherapy for conditions that would typically warrant follow-up, along with members with no medical or pharmacy claims. In other words, these are individuals for whom a follow-up is clinically indicated. The numerator is the predicted subset of those members who will not receive the needed follow-up in the subsequent 12 months.

This approach helps pinpoint where critical gaps in care will occur and highlights potential barriers to access. It advances DHCS's ability to surface many members previously not recognized as underutilizing the services they likely need.

Behavioral Health and Social Risk: The inclusion of behavioral health and social risk factors for the adult and pediatric models makes RSST unique because it goes beyond traditional models that focus solely on physical health or health care utilization. By integrating predictors such as mental health conditions, substance use, housing instability, and social drivers, RSST provides a more holistic and accurate prediction of member's future risk of experiencing negative health outcomes. Social risk factors are not yet incorporated into the birthing models due to data limitations.

Max-Tier Logic: If a member is high-risk in any single subdomain, they are classified as high-risk overall. This "max tier" approach ensures that significant needs are not overlooked, even if needs are concentrated in only one area.

By not averaging or diluting risk across subdomains, RSST prevents significant concerns from being masked by lower risk in other areas, ensuring that members with urgent or complex challenges receive timely outreach and care coordination. This method is especially important for surfacing specific but critical needs across multiple domains that might otherwise be missed in a more generalized risk assessment.

Standardization and Equity: RSST uses the same methodology statewide, across all members, reducing variability and supporting equitable care. Equity and monitoring are built into every stage, from data selection and model development to validation and performance tracking.

Technical Design

RSST is composed of thirteen predictive models—five for adults, five for children, and three for the birthing population—each trained on eight years of historical Medi-Cal data that includes professional, facility, dental, behavioral health, and pharmacy claims, as well as detailed member enrollment information for over 15 million individuals. These models draw from two primary data sources: Medi-Cal administrative claims and SUME eligibility data, both standardized by DHCS using the All-Payer Claims Data Common Data Layout (APCD-CDL). For birthing models, data sources also include historic vital birth certificate records to create a parent-child linkage that ties an adverse infant outcome back to the birthing parent’s claims history.

The training process uses sophisticated data partitioning and “what was known when” logic to accurately reflect real-world prediction scenarios. The models predict a variety of binary outcomes for each member over the next 12 months using advanced but proven machine learning techniques widely adopted in health services research and public health. These include XGBoost (gradient-boosted decision trees), with LightGBM and regularized logistic regression as comparators for adult and pediatric models. Birthing models were trained using XGBoost only.

Model development took place in a distributed, GPU-accelerated computing environment, enabling efficient processing of large-scale data. Birthing models used a single GPU-accelerated configuration due to the smaller population dataset.

Birthing models operate at the pregnancy-episode level rather than the person-month level, reflecting the episodic nature of pregnancy. Predictions and adverse outcomes are assessed across the entire episode timeframe, with technical performance measured at the aggregate level.

For complete details about technical design, refer to the [RSST Transparency Document](#) (updated August 2026), beginning on page 77.

Model Performance

Statistical validation tests demonstrate that RSST is highly effective at predicting both future health events and underutilization of care, successfully identifying members whose needs might otherwise go unnoticed.

Adult and Pediatric Models

RSST is calibrated so that the high-risk tier includes approximately ten percent of the Medi-Cal population, striking a balance between effective resource targeting and health plan capacity. RSST's technical performance is robust, with area under the curve (AUC³) scores ranging from 0.75 to 0.94 across models. Recall⁴ for the high-risk tier is approximately 0.23–0.24, and number-needed-to-treat (NNT⁵) values ranging between 1.75 and 1.97. Precision metrics show that more than half of those flagged as high-risk subsequently experience an adverse outcome—demonstrating both accuracy and practical value.

Birthing Models

Episode-level discrimination was moderate to strong, with AUC values ranging from 0.71 to 0.85. Episode-level recall ranged from approximately 44% to 51%, with needed to treat (NNT) values ranging between ~2.0 and ~3.8, indicating that for every 2–4 pregnancy or postpartum episodes flagged as high risk, one went on to experience a modeled adverse event.

Birthing model development, training, testing, and deployment were all conducted within the same production environment, using the same member identifiers, data sources, and SQL-based implementation. As a result, the cross-environment validation performed for adult and pediatric models was not applicable for the birthing models.

Ensuring Equity

Equity has been a core focus throughout RSST's development. To ensure the model performs equitably, its predictive accuracy is rigorously evaluated across key subgroups—including race, ethnicity, language, sex, and new Medi-Cal enrollees. Specifically, we assess Recall, which measures the model's ability to correctly identify all members who truly need support (i.e. true positives). The goal is to maintain subgroup

³ AUC indicates how well models can predict people who will experience an outcome versus people who will not. An AUC of 1.0 means a model predicts outcomes perfectly; 0.5 means the model is no better than flipping a coin.

⁴ Recall (i.e., sensitivity) measures how many of the true cases of an outcome the model successfully identifies.

⁵ NNT measure show many people must be identified to receive outreach and engagement to reach one member who has a poor outcome. For instance, an NNT of 2 means that one out of every 2 members identified as high-risk would go on to have one or more of the outcomes.

recall rates within 80% of the statewide average, helping ensure that no group is systematically under-identified. This approach supports equitable identification of high-risk members across the diverse Medi-Cal population.

DHCS is committed to ongoing monitoring, using industry-standard metrics such as AUC, recall, and calibration, and will regularly retrain and validate the models to ensure they remain accurate and equitable as populations and care patterns evolve.

Collaborative Development

The RSST algorithm was developed through a rigorous and collaborative process. It was guided by a robust leadership and governance structure to ensure methodological rigor, stakeholder alignment, and real-world relevance.

DHCS established dedicated internal leadership and the RSST Work Group to oversee strategy and execution. An Academic Work Group of national experts in health equity, Medicaid analytics, and machine learning provided technical guidance. Members brought deep expertise in ethical AI, advanced statistical methods, and causal inference—contributing cutting-edge insights from their work. Their expertise helped ensure the model was grounded in both methodological innovation and real-world applicability. A Scientific Advisory Council—including representatives from MCPs, care delivery systems, and academic institutions—advised on key decisions and ensured the model's practical applicability.

Further, MCPs were actively involved through the Medi-Cal Connect Advisor process, where selected MCPs reviewed and validated RSST risk tier assignments for each of the three populations against their internal assessments and care management activities. These MCPs provided feedback on the algorithm's accuracy, usability, and policy implications. DHCS also engaged clinical subject matter experts, including maternal-fetal medicine OB/GYNs and DHCS Birthing policy leads, to support the development of the birthing models. This multi-level governance approach prioritized evidence-based methods, transparency, and stakeholder input at every stage of algorithm development.

Limitations

While RSST represents a significant advance, it's still in its early stages and it does have limitations. The system currently relies on claims and eligibility data resulting in data lags and does not yet include broader clinical sources like electronic health records. Claims data can also be incomplete, which may affect precision when identifying at-risk

members. In addition, prenatal services are frequently submitted as global or bundled claims, limiting the ability to measure individual service-use patterns during pregnancy. Certain member groups, such as Dual Eligibles (i.e., members who are eligible for both Medicaid and Medicare), are excluded due to incomplete data. This creates gaps for members receiving care elsewhere, though this represents a small portion of the overall population. As Medi-Cal's population evolves, tier thresholds and definitions may need to be updated.

Conclusion

RSST lays the foundation for a more proactive, data-driven, and equitable Medi-Cal system. By systematically identifying not only those who will be at highest risk for poor outcomes, but also those most likely to underuse necessary services, RSST will help DHCS and its Medi-Cal partners close gaps and improve outcomes for California's most vulnerable residents. The RSST algorithm will be open-sourced, promoting transparency, collaboration, and continuous improvement across the health care ecosystem. Ongoing updates and stakeholder collaboration will ensure the tool continues to adapt and drive improvements in population health statewide.

To learn more, visit dhcs.ca.gov/medi-cal-connect. Download the full RSST Transparency Document (August 2026) at dhcs.ca.gov/medi-cal-connect/about-rsst.

Appendix A. RSST Outcomes: Adult and Pediatric Models

Domain	Subdomain	Adult Model Outcomes	Pediatric Model Outcomes
Adverse Events	Physical Health	» Morbidity » Mortality » All Cause Inpatient Admissions » 3+ All Cause ED Visit	» Morbidity » All Cause Inpatient Admission » New Diagnosis of Common Chronic Illness » 3+ All Cause ED Visit
	Behavioral Health	» Care for Unintentional Drug OD » Injection Drug-Related Adverse Event » Care for Intentional Self-Harm » Psychiatric Admission » 2+ Psychiatric ED Visits » Co-Occurring High ED Utilization and MH/SUD Care	» New Diagnosis of Mental Illness » New Diagnosis of Developmental Delay » New Diagnosis of SUD » Psychiatric Admission » Psychiatric ED Visit » Care for Drug Overdose » Care for Intentional Self-Harm
Underutilization	Physical Health	» Underuse of Primary Care Visits » Underuse of Dental Care » Underuse of STI Screening (Chlamydia) among Females 16-24 » Underuse of Appropriate	» Underuse of STI Screening (Chlamydia) among Females 16-24 » Underuse of Well-Child Visits » Children and Adolescents with No Claims Utilization » Underuse of Topical Fluoride and/or Dental Care

Domain	Subdomain	Adult Model Outcomes	Pediatric Model Outcomes
		- Pharmacotherapy for Common Indications » Underuse of Asthma Controller Medications » No Medical or Pharmacy Claims	» Underuse of Immunizations » Underuse of Asthma Controller Medications
	Behavioral Health	» Underuse of MH/SUD Office Visits » Underuse of MH/SUD-Related Primary Care » Underuse of Antidepressant Medications » Underuse of Antipsychotics (Schizophrenia) » Underuse of Opioid Agonist Therapy (OUD)	» Underuse of PCP Visits (among members with BH/SUD) » Underuse of MH/SUD-Related Office Visits » Underuse of Metabolic Screenings (among members with antipsychotics) » Underuse of Follow-Up Visits » Underuse of ADHD Follow-Up Care
Social Risk	Adverse Social	» Housing Instability	» Housing Instability

Appendix B. RSST Outcomes: Birthing Models

Domain	Subdomain	Birthing Model Outcomes
Adverse Events	Pregnancy	» Care for Unintentional Drug Overdose » Care for Intentional Self-Harm » Injection Drug Related Adverse Event » Care for Maltreatment/Abuse » Psychiatric ED Visit » All Cause Inpatient Admissions » Thromboembolism » Maternal Mortality » Gestational Diabetes Requiring Insulin » Placental Abruption » Severe Fetal Outcome » Severe Maternal Morbidity Composite » Unplanned C-Section » Neonatal NICU » Neonatal Mortality » Neonatal Abstinence Syndrome » Early Preterm and/or Very Low Birthweight
	Post-Pregnancy Physical	» Post-Pregnancy Hypertensive Disorders » Post-Pregnancy Hemorrhage » Thromboembolism (DVT/PE) » Maternal Mortality » Infant Mortality » Infant NICU
	Post-Pregnancy Behavioral	» Care for Unintentional Drug Overdose » Care for Intentional Self-Harm » Injection Drug Related Adverse Event » Care for Maltreatment/Abuse » Psychiatric ED Visit » Psychiatric Admission