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Using predictive modeling to strengthen child welfare systems

From targeted use cases to measurable system impact

Predictive modeling with advanced machine learning can help child welfare agencies support their practice and case management. But to realize the full potential of those models to improve decision making and system management, agencies need to make sure they start with the right use cases, validate them before implementation, and integrate them into real workflows.

From analytic potential to improved outcomes

Mathematica partners with child welfare jurisdictions to move from use case selection to model development, implementation, and measurable improvement.

1 Explore and prioritize opportunities

- Assess your priorities, data, decision points, and workflows
- Compare candidate use cases for value, feasibility, and fit
- Identify one to three high-impact options to define

2 Define the selected use case

- Specify the decision, population, outcome, and workflow
- Estimate impact, implementation requirements, risks, and bias
- Align the use case with agency and federal priorities

3 Develop and validate the model

- Build or adapt the model using child welfare and cross-system data
- Assess accuracy, calibration, subgroup performance, and stability
- Translate risk signals into clear, action-ready outputs

4 Implement, test, and scale

- Pilot in practice with guardrails for safety, bias, and transparency
- Monitor outcomes, model drift, uptake, and implementation barriers
- Scale solutions that demonstrate measurable improvement

5 Assess and refine as needed

- Continue to monitor outcomes, model drift, and user uptake
- Monitor model performance
- Periodically validate and adjust the model as needed

Our collaborative approach to predictive models

Start with strategy

Select and define the use case based on your priorities before building the model.

Build for practice

Co-design protocols, dashboards, governance, and training to support practice.

Validate before use

Assess your model's accuracy, calibration, bias, stability, and usability.

Measure what changes

Track safety, permanency, placement stability, bias, and resource use.

Adjust as needed

Monitor model performance and adjust the model as needed.

Predictive modeling that connects analytic insight to frontline practice, system management, and better outcomes for children and families.

With new federal momentum—including the **Predictive Analytics in Child Welfare Demonstration Grants** from the Administration for Children and Families' Children's Bureau—child welfare agencies have a timely opportunity to use predictive modeling to address specific practice and system challenges. Robust use cases can help state agencies achieve the Administration for Children and Families' goal of ***A Home for Every Child*** to strengthen foster care capacity, reduce unnecessary foster care entries and time in care, improve permanency, and manage system performance. These use cases can also serve as practical strategies for stronger decision support, better resource targeting, and broader system reform.

High-value predictive model use cases for child welfare agencies

Strengthen foster care capacity
Increase supply

Right homes, right places
- Forecast demand by geography and need
- Identify gaps and target recruitment by community

Better matching and stability
- Support child-home matching
- Predict placement stability and disruption risk

Recruitment and retention
- Identify homes at risk of attrition
- Prioritize supports and monitor supply pressure

Reduce entries and time in care
Decrease demand

Entry reduction and safety
- Improve screening and investigation decisions
- Predict foster care entry and focus on in-home supports

Prevention and complex needs
- Identify prevention candidates from the Family First Prevention Services Act and those with complex needs
- Align services with risk and need

Permanency and re-entry
- Estimate reunification likelihood
- Predict re-entry or disruption and prioritize supports

Cross-cutting applications

System management
Prediction and analysis of caseload complexity, workforce allocation, outlier decision patterns, and practice variation across regions or staff.

Policy and hotline reform
Assess changes to mandated-reporting thresholds, hotline consolidation, screening consistency, and what-if scenario modeling.

Program integrity
Identify duplicate or improper payments, fraud or misuse patterns, cross-system billing inconsistencies, and inefficient service allocation.

A valuable tool to achieve *A Home for Every Child* and broad system improvement

These use cases can advance the Administration for Children and Families' goal of *A Home for Every Child* by increasing well-matched foster homes and reducing entries into or time in care. They also apply broadly to agencies seeking stronger practice, better targeting of resources, and improved outcomes for children and families.

Contact us to explore your predictive analytics needs:
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