

## Use Predictive Analytics to Plan, Prepare, and Progress

Using data to make evidence-based decisions seems easy enough. Yet the data are messy. The systems are old. The stakes are high. When it comes to using predictive analytics to manage, improve, and scale social programs, the pressure is on to get it right.

From child welfare to health care, Mathematica applies our expertise at the intersection of data, methods, policy, and practice to help you plan, prepare, and progress. Combining increasing computational power and technology, abundant and diverse information, we have helped policy makers and program administrators get the most out of their current programs while also working to anticipate and address future changes.



## Reliable, rigorous, real-world solutions for complex problems worth solving. We've helped our clients:

### Forecast claims data to get actionable information in near real-time:

**Problem:** Medicare alternative payment models need up-to-date spending information to calculate risk and predict costs. However, it can take up to a year from the time services are provided to when data are made available, meaning recent data do not give an accurate picture of what is happening to patients right now.

**Solution:** We analyzed historical claims records using a deep neural network model to forecast patient spending and risk of re-hospitalization or death. These forecasts, combined with legacy data, provide a more complete picture of model performance and allow the client to make quicker, evidence-based decisions about program adjustments and hospital interventions to improve the health and well-being of Medicare patients.

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## **Provide more placement stability by identifying risk of “superutilization” of child welfare services:**

**Problem:** Within the child welfare system, foster care placement stability is an important factor that contributes to children ending up in permanent and safe homes. Understanding the risk factors for frequent changes in foster care placement (or “superutilization”) could help identify children at an early stage and promote a more stable living environment.

**Solution:** We built a series of predictive models to estimate each child’s risk of “superutilization” in regard to frequent foster care placement changes. The approach included linking child welfare and Medicaid data (including utilization of physical and behavioral health services) and developing a new multi-faceted measure of “superutilization.”

## **Determine unmet mental health burden in the military:**

**Problem:** Studies and anecdotal evidence have noted a large mental health need among current and former military service members and their families, but many of the affected individuals are not seeking treatment.

**Solution:** We built a semi-supervised machine learning algorithm based on administrative data and medical records to estimate the size of and characteristics of the unmet need in order to help the Defense Health Agency identify individuals who need, but are not receiving treatment.

**Let’s Progress Together.** Contact Phil Killewald [pkillewald@mathematica-mpr.com](mailto:pkillewald@mathematica-mpr.com), Jonathan Gellar [jgellar@mathematica-mpr.com](mailto:jgellar@mathematica-mpr.com), or Sheng Wang [swang@mathematica-mpr.com](mailto:swang@mathematica-mpr.com) for more information.

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