Government by Algorithm?
A Case Study of Predictive Analytics in Child Protective Services

Rhema Vaithianathan
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Research Team

- Rhema Vaithianathan, Auckland University of Technology
- Emily Putnam-Hornstein, University of Southern California
- Erin Dalton, Allegheny County
- Alex Chouldechova, Carnegie Mellon University
Discuss the use of predictive risk modelling in child protection in the US

Contrast with use in Criminal Justice

Outline why there is more community acceptance in child protection
Automatic risk scoring tool which generates a risk score for an adverse event based on large administrative dataset

Uses data collected by Governments as part of its business process to identify individuals who will have a bad outcome
Children in the Public Benefit System at Risk of Maltreatment: Identification Via Predictive Modeling

Rhema Vaithianathan, PhD, Tim Maloney, PhD, Emily Putnam-Hornstein, PhD, Nan Jiang, PhD

Abstract: A growing body of research links child abuse and neglect to a range of negative short- and long-term health outcomes. Determining a child’s risk of maltreatment at or shortly after birth provides an opportunity for the delivery of targeted prevention services. This study presents findings from a predictive risk model (PRM) developed to estimate the likelihood of substantiated maltreatment among children enrolled in New Zealand’s public benefit system. The objective was to explore the potential use of administrative data for targeting prevention and early intervention services to children and families.

A data set of integrated public benefit and child protection records for children born in New Zealand between January 1, 2003, and June 1, 2006, was used to develop a risk algorithm using stepwise probit modeling. Data were analyzed in 2012. The final model included 132 variables and produced an area under the receiver operating characteristic curve of 76%. Among children in the top decile of risk, 47.8% had been substantiated for maltreatment by age 5 years. Of all children substantiated for maltreatment by age 5 years, 83% had been enrolled in the public benefit system before age 2 years. This analysis demonstrates that PRMs can be used to generate risk scores for substantiated maltreatment. Although a PRM cannot replace more-comprehensive clinical assessments of abuse and neglect risk, this approach provides a simple and cost-effective method of targeting early prevention services.


2013, American Journal of Preventive Medicine, 45(3)
Children 'not lab-rats' - Anne Tolley intervenes in child abuse experiment

STACEY KIRK
Last updated 05:00, July 30 2015
US: Child Protection Overview
The Problem

- 3.6 million referrals of abuse and neglect every year
- 1 in 3 US children experience an investigation by age 18
- 1 in 7 US children are substantiated as victims
A New Approach
Allegheny County, PA, US
14,121
Referrals to Child Welfare

53%
Screened Out

47%
Screened In
Score tells us the risk that the child will be removed from home in 2 years and placed in foster care…
1 in 100 children who received a score of 1 were placed out-of-home within 2 years of the call.
1 in 2 children who received a score of 20 were placed out-of-home within 2 years of the call.
Injury Validation

Score of 20 versus 1?

- 21 times more likely to be admitted for a self-inflicted injury
- 17 times more likely to be admitted for physical assault
California
Single data source...


Summary

The increased availability and quality of administrative data during the last several decades have led to growing interest in tools and statistical models that can be deployed in real time to predict future events. Predictive risk modeling (PRM) is one such class of tools. PRM is used to automatically generate a risk score for each individual in a given data system, providing a sufficient means of screening populations without requiring any additional data entry.

The goal of the project is to establish whether the statistical modeling of historical child protection records can be used to improve the initial screening and triage of child abuse and neglect referrals. Although the project will not result in a tool without future technological investments, it will lead to the development of data that can inform (in an open and transparent fashion) the opportunities

FUNDERS
California Department of Social Services (CDSS)
Office of Child Abuse Prevention (OCAP)
Laura and John Arnold Foundation (LJAF)
Percentage of child/referral events in each decile with the child *placed in foster care* within 24 months (state average: 10%)
External Validation [preliminary]
Maltreatment Near-Fatalities & Fatalities among children under 5 years

- 74% (Age 1)
- 52% (Age 9)
- 22% (Age 8)
- <1% (Age 3, 4, 5, 6, 7, 10)
- 0.0% - 0.5% (Age 2)

Graph showing percentage distribution by age.
Criminal Justice Use Case
Releasing prisoners on bail

¬ US has the highest incarceration rates in the world
¬ The majority of people in jail have not been convicted but are awaiting trial
¬ Use of predictive risk models to help judges decide whether to release prisoners on bail
¬ Predicts if prisoner will recidivate
¬ Use is found to be racially biased
Machine Bias

There's software used across the country to predict future criminals. And it's biased against blacks.

Source:
Julia Angwin,
Jeff Larson,
Surya Mattu and
Lauren Kirchner, ProPublica
Contrasting Allegheny Case vs. Criminal Justice Case
CAREFUL IMPLEMENTATION
EMPHASIS OF HUMAN IN THE DECISION LOOP

This is **not** your new process

This is the process

**Call Screening Process**

- Call information received and processed
- Assigned Call Screener collects additional information from sources including, but not limited to, the individual who reported the mistreatment and the Client View application that displays individual-level prior service involvement.
- Call Screener assigns risk and safety ratings based on information collected.

**NEW STEP**

- Call screener runs the Allegheny Screening Tool

Consultation with the Call Screening Supervisor

In limited cases, a field screen is conducted.

**Child Welfare Call Screening Decision**

- Screen Out
- Open Investigation

**Investigation Findings/Service Decision**

- Provide family with information for other services or agencies they may find helpful
- Do Not Accept the Services
- Accept for Services
- New Child Welfare Case Opens
“Only one of the jurisdictions, Allegheny County, was able to furnish both the actual predictive algorithms it used (including a complete list of factors and the weight each factor is given) and substantial detail about how they were developed.”

(page 26)
Next steps - implementing an algorithm at birth to predict which child will be notified to child protection