Evaluating the Effectiveness of the Family First Prevention Services Act Using NLP and Staggered Difference-in-Differences Model

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Introduction

- The Family First Prevention Services Act (FFPSA), enacted in 2018, marked a shift in U.S. child welfare, prioritizing family preservation and prevention over foster care placement.
- Early evaluations indicate a 51% reduction in repeat maltreatment among FFPSA participants and an 11% decline in foster care placements from 2017–2021.
- State policy environments differ, influencing how FFPSA is implemented and its impact on child outcomes. Four distinct policy clusters were identified in prior work (Luo et al., under review): **Cluster 1: Broad definitions, strict reporting, strong penalties, extensive differential response; Cluster 2: Fewer reporting mandates, weaker penalties; Cluster 3: Narrow definitions, lenient safe haven policies; and Cluster 4: Minimal differential response, traditional case handling**.
- This study applies NLP to examine FFPSA policy components and their associations with maltreatment outcomes, accounting for different state policy structures.

Methods

- Data sources: FFPSA plans from National Conference of State Legislatures, child maltreatment data from National Child Abuse and Neglect Data System (NCANDS), and demographic data from American Community Survey (ACS).
- **PICO** framework:
  - Population: children under 18 from 2018 to 2022;
  - Intervention: post-FFPSA implementation;
  - Comparison: pre-implementation/non-adopting states;
  - Outcome: Indicated maltreatment rate per 1,000 child.
- FFPSA component analysis: 5 topic modeling approaches (Top2Vec, BERTopic, BERTopic with MMR, NotebookLM, and custom RAG model) were used to identify and evaluate key FFPSA components, assessed via quantitative and expert evaluations.
- Study design: difference-in-differences (DiD) with staggered adoption to estimate FFPSA effects on maltreatment rates.
- Interaction analysis: Examined whether FFPSA effects differed across state policy clusters.

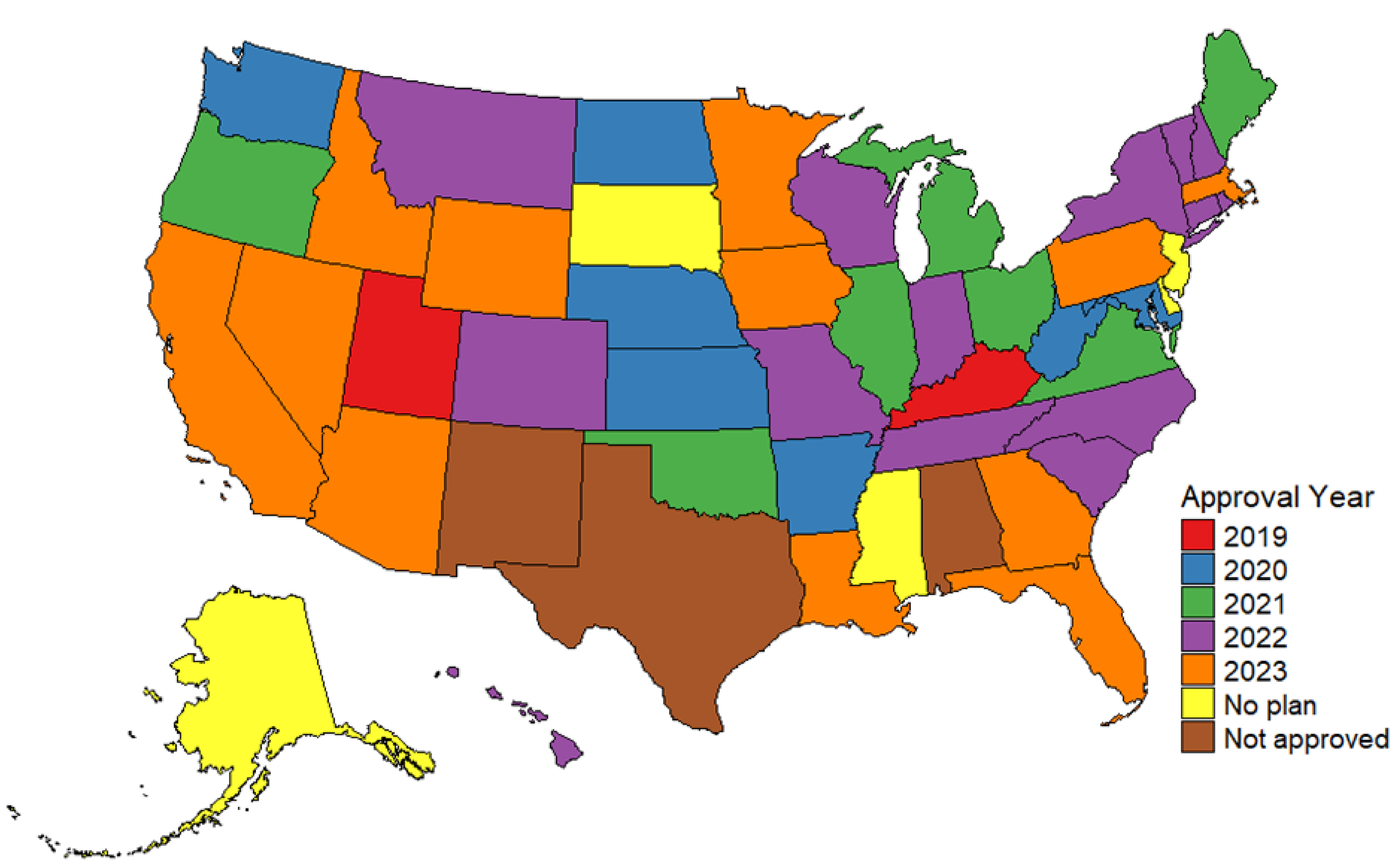

Figure 1. FFPSA Plan Approval Timeline in the U.S.

Results

- Both quantitative and expert reviews showed that NotebookLM performed the best among 5 methods.
- Four FFPSA components were identified: **A. prevention and family support; B. kinship care; C. Qualified Residential Treatment Programs (QRTPs); and D. family-based placement options**.

Table 1. Statistical Results

	FFPSA as a whole		FFSPA components		FFPSA effect by state	
	estimate	p-value	estimate	p-value	estimate	p-value
Approval Date	-0.000	0.629	-0.000	0.712	-0.000	0.676
Age Under 5 [1]	-0.663	0.422	-1.403	0.095	-1.346	0.111
Male [1]	2.250	0.480	-0.371	0.906	-0.147	0.963
White [1]	-0.470	<0.001	-0.419	<0.001	-0.404	<0.001
Hispanic/Latino	-7.279	<0.001	-7.177	<0.001	-8.127	<0.001
Poverty [2]	0.514	0.534	1.017	0.220	0.078	0.926
COVID-19 [3]	-0.150	<0.001	-0.148	<0.001	-0.144	<0.001
Sin_time [4]	0.017	<0.001	0.017	<0.001	0.017	<0.001
Cos_time [4]	-0.047	<0.001	-0.047	<0.001	-0.047	<0.001
FFPSA	-0.056	<0.001				
Component A			-0.110	<0.001		
Cluster1					0.111	0.005
Cluster2					-0.127	0.047
Cluster3					-0.124	0.003
Cluster4					-0.072	0.095
Component B			0.162	<0.001		
Cluster1					-0.040	0.525
Cluster2					0.188	0.010
Cluster3					0.160	<0.001
Cluster4					-0.013	0.851
Component C			-0.123	<0.001		
Cluster1					-0.072	0.278
Cluster3					-0.200	<0.001
Cluster4					-0.400	<0.001
Component D			0.016	0.535		
Cluster1					-0.020	0.600
Cluster3					0.170	<0.001
Cluster4					-0.046	0.428

Table Notes:
1. Reference group for age under 5 is age 5 to 17; reference group for male is female; and reference group for White is non-White.
2. Percentage below poverty.
3. The study used March 11, 2020, as the start date for COVID-19, aligning with the World Health Organization's declaration of the pandemic.
4. These terms capture maltreatment seasonality, which includes $\sin(2\pi t/T)$ and $\cos(2\pi t/T)$, where t represents time in months, and T=12 corresponds to a full annual cycle

- FFPSA implementation was significantly associated with lower maltreatment rates ($\beta=-0.056$, $p<0.001$).
- Prevention and family support and QRTP reduced maltreatment risk; kinship care support increased risk.
- Component effects varied by state policy cluster. QRTP showed consistently protective effects across state clusters.

Discussion

- Upstream family services matter: Prevention and family support services are effective in reducing maltreatment, especially in states with narrower maltreatment definitions and lenient safe haven laws.
- QRTP standards consistently protective: High-quality, evidence-based residential care reduces maltreatment risk across all policy environments.
- Limitations: Data only through 2022; fixed effects models cannot establish causality