



**FLORIDA DEPARTMENT  
OF CHILDREN AND FAMILIES**  
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# **Florida Department of Children and Families**

## *Executive Digest*

### **Child Fatality Trend Analysis January 1, 2007 through June 30, 2013**



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The Department of Children and Families contracted with North Highland to analyze the child fatalities reported to the Florida Abuse Hotline from January 1, 2007 to June 30, 2013. The purpose of the analysis is to confirm general trends in child fatalities, provide an initial set of key risk factors through data discovery and statistical analysis, and lay the groundwork for future advances in child welfare practice supported by predictive analytics tools and techniques.

## ***PROJECT OVERVIEW***

North Highland (NH) is the primary lead on the project, providing project management, supporting the data scientists and child welfare domain experts, as well as compiling the final report. The SAS Institute (SAS) provides sophisticated statistical analysis through their Advanced Analytics Lab. The Child Welfare Policy and Practice Group (CWG), a private, non-profit organization, provides thought leadership in achieving high quality front-line practice and improved outcomes for family and community services.

The project spanned five weeks and was limited to two primary data sources: Florida Safe Families Network (FSFSN) and the Child Death Review Database (CDR). Additionally, three secondary summary-level sources were referenced, from the Department of Health, Abuse Hotline, and Child Protective Investigators. The data population consisted of reports to the Hotline about a child fatality that contained allegations of abuse or neglect as factors leading to the child's death. The population included both the children whose families did - as well as those who did not - have prior agency involvement in protective investigations. The child fatalities were compared to the entire FSFN population of children who were involved in child protective investigations from January 1, 2007 and June 30, 2013.

It was agreed that the following would apply to any data provided by DCF:

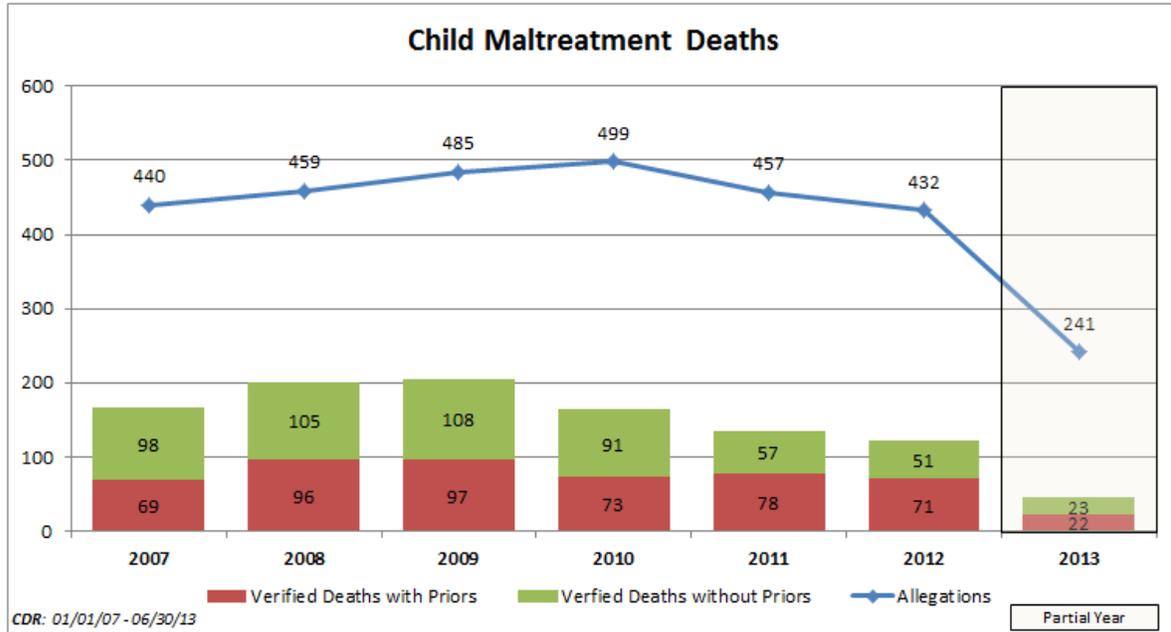
- No Personally Identifiable Information (PII)
- No text fields as they may contain PII
- No filtering/manipulation by DCF (other than date range, death allegations, and assorted aggregate counts)
- Data sources are deemed reasonably accurate and known limitations of the data was considered as part of the analysis.

Interviews with several child protection individuals in the medical, legal, community-based care, law enforcement, prevention and quality assurance professions yielded rich information about strategies that further informed the data findings in this report.

## ***GENERAL TRENDS***

As part of the analysis of data, general trends were captured to set a baseline for the incident of maltreatment deaths from January 1, 2007 through June 30, 2013, and as

backdrop for the statistical modeling. Please note that 2013 is a partial year, as indicated on the chart, with 6 months of data, as opposed to the 12 months of data for other years.



As the chart illustrates, since 2010 there has been a slight downward trend in both alleged and verified<sup>1</sup> child fatalities due to maltreatment. The majority of those allegations (ranging between 55% and 66%) were regarding children who had no prior involvement with DCF. This is consistent with national patterns.

The Type of Death shows a considerably higher rate of Neglect deaths (ranging from 80% to 84%) as compare to Abuse and all others - and the trend has remained steady from 2007 to 2012. This is also consistent with national patterns.

The majority of maltreatment deaths fall into two categories: Asphyxiation and Drowning. Based on this fact, our trend analysis and the Analytics Modeling focused on these two categories of Neglect as well as the Abuse category. Both Asphyxiation and Abuse showed a downward trend since 2010. By contrast, the number of deaths due to Drowning remained essentially steady during the period.

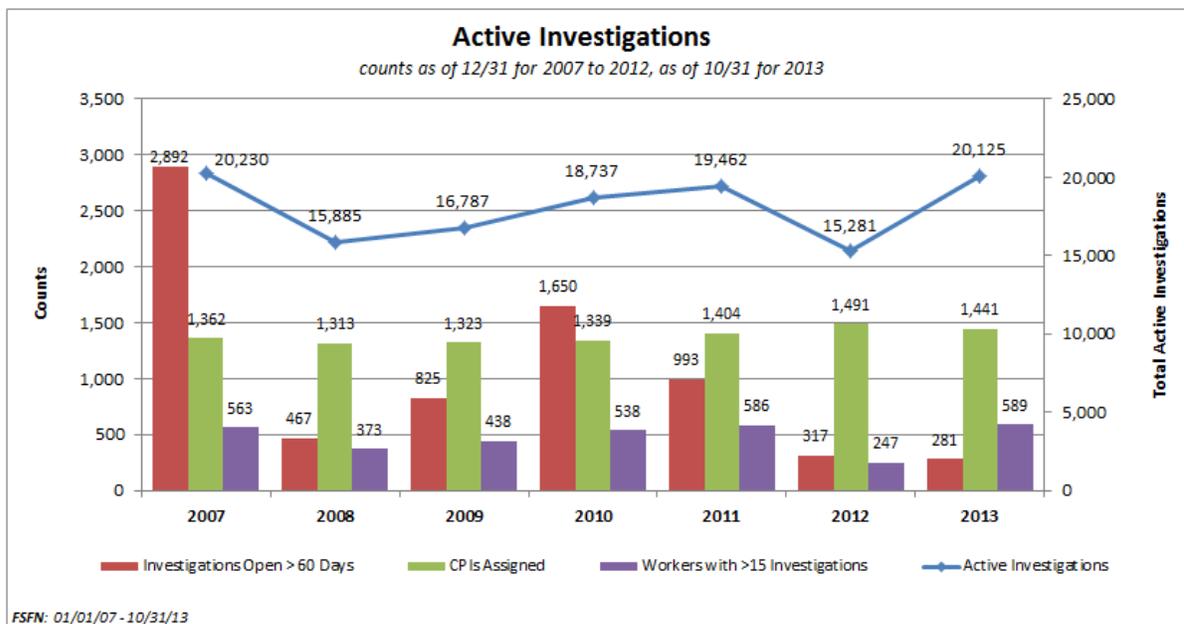
The agency also reviews a population of children fatalities that are reported but do not contain any allegation of child abuse or neglect as a factor contributing to the deaths. Tracking these deaths was developed as a part of the CDR in 2009<sup>2</sup>. These are children who

<sup>1</sup> Once a child death investigation is concluded, it is closed as verified, not substantiated, or no indicators. "Verified" indicates a preponderance of credible evidence exists to determine that the specific harm or threat of harm was a result of abuse, abandonment or neglect

<sup>2</sup> One such death indicated for 2008 is included as it was reported during calendar year 2009

may have been receiving community-based care services and died due to natural causes or who came into foster care as medically complex children whose parents did not have the capacity to take care of their needs. They also include children whose families were involved in an active child protection investigation at the time of a child's death. Examples include children who die in car accidents, sudden unexplained infant deaths, acute asthma attacks or other circumstances that do not involve any suspicions of abuse or neglect. The agency is required by law to review these deaths despite the absence of any allegation of abuse or neglect.

In our trend analysis, we also examined the total number of births and child deaths in Florida, utilizing data from the Department of Health's Vital Statistics data source, finding that both have remained near stable, exhibiting a very slight and slow decline. We also considered the total number of active child protective investigations, which, other than a dip in 2012, show an increasing trend since 2008. We reviewed investigator workload, as measured by the number of active investigations, noting that approximately 40% of Child Protective investigators (CPIs) were assigned to 15 or more active investigations.



## ANALYTICS RESULTS

When reading the following chart, factors in red above the 0-axis line are negative risk factors that increase the odds of death while those below (in green) are positive risk factors that reduce the odds of death. Also, note that the y-axis is a logarithmic scale where intervals are in orders of magnitude rather than a standard linear scale.

The chart below contains the risk factors that are statistically significant across all alleged maltreatment deaths. These fourteen factors were identified by running statistical models against a large set of variables considering whether elements like gender, ethnicity, number of siblings, etc. increase or decrease the odds of death. With each modeling iteration, the variables that were not statistically significant were removed from the model (e.g., being female does not increase the odds of dying due to maltreatment) and the more impactful variables were made the focus (e.g., having in-home visits does greatly reduce the odds of death). This process was repeated until the model was narrowed down to the factors in the chart below. Given all else being equal:

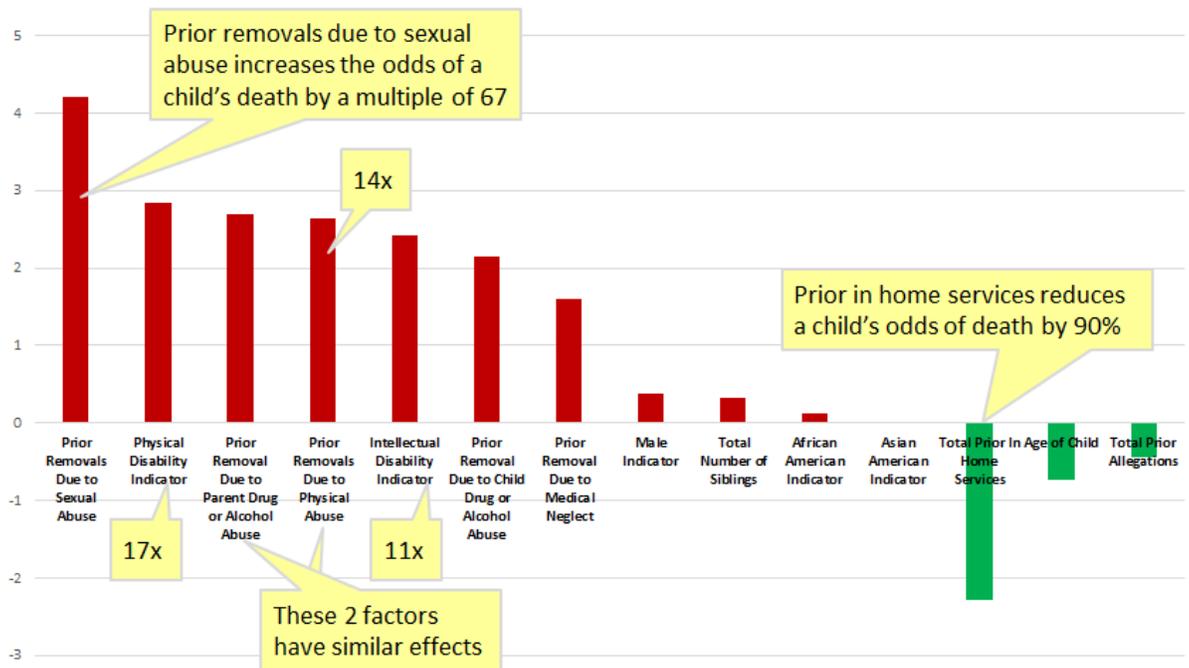
- Prior **in-home services** reduce the odds of death by **90%**

This would indicate that visits to the home have a positive impact on keeping children safe. To lower a child's risk of death, more in-home services would be recommended.

This effect was observed in the Abuse and Drowning categories. It was not statistically significant in the Asphyxiation category.

# Baseline Risk Factors for All Child Deaths

## Effect of Each Variable



- Each instance of a **prior removal due to physical abuse *increases*** the odds of death by a **multiple of 14**

This effect was observed in the Abuse category. It was not statistically significant in the Asphyxiation and Drowning categories.

- The impact of each **prior removal due to parents who have abused alcohol or drugs *increases*** the odds of deaths by **a multiple of nearly 15**. This effect is similar for **prior removal due to physical abuse**.

This effect was strongest in the Asphyxiation category, followed by Drowning. It exhibited less of an effect, though still statistically significant, in the Abuse category.

- The child having a physical disability ***increases*** the odds of death by a **multiple of 17**

This effect was observed in the Abuse and Other Neglect categories. It was not statistically significant in the Asphyxiation, and Drowning categories. It should be noted that both the physically disabled and intellectually disabled risk factors were based on very small data sets of child fatalities.

- Each instance of **prior removal due to sexual abuse *increases*** the odds of death by a **multiple of 67**

This effect was observed in the Drowning category. It was not statistically significant in the Asphyxiation and Abuse categories. It should be noted that this risk factor was based on a very small data set of child fatalities.

- **75% of all child deaths occur between 0 and 2 years of age**

The effect of the child's age as a risk factor was observed across the board, and strongest in the Asphyxiation category.

### ***OBSERVATIONS AND RECOMMENDATIONS***

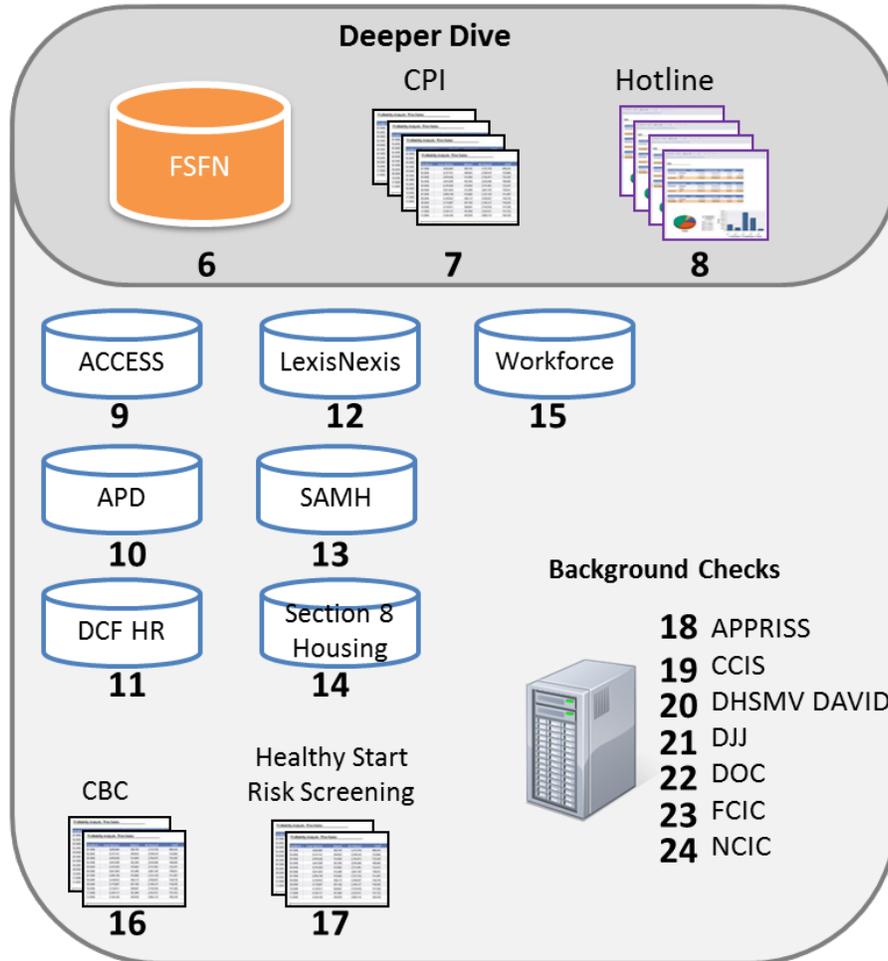
During the course of the project, opportunities data and process improvements were noted including:

1. **Reliable Data Entry** – increase the number of consistent field values (i.e. drop-box choices), rather than reliance on free-form text data.
2. **Ambiguous Field Names and Values** – rename fields and values that can be confusing to the users, leading to incorrect data capture.
3. **Historical Tracking** -- add tracking in key areas, such as investigator assignments and household member, for a full record of involvement with a child over time.
4. **Training and Document Review** – provide additional training for data accuracy and consistency, and for clarity on use of new functions (#1 - #4 above).
5. **Community-Based Care (CBC) Reporting** – improve CBC reporting to be more robust, readily accessible, and supportive of ad-hoc reporting and analytics needs.

### ***THE PATH FORWARD: ROADMAP TO PREDICTIVE ANALYTICS AS A TOOL FOR IMPROVED PRACTICE***

In order to produce a comprehensive predictive model, a Child Welfare Heightened Risk analytics model should be developed to improve Child Welfare and Family Safety practices, to support CPIs, CBCs, and DCF management. By incorporating a wider set of data, a richer and more meaningful analysis can be done. Some of the sources used in the Child Fatality Trend Analysis would be expanded as well as inclusion of new sources that could indicate risk factors like financial hardship, substance abuse or mental health stresses on the family, or household members with a history of crime or violence. These data sources are illustrated in the following diagram, and the potential uses of the data is described in Section 8 of this report.

## Future



Ultimately, being able to determine which children are at a greater risk would offer an additional tool for DCF to better assess and provide for the safety of the children they serve.