



DIFFERENTIAL RESPONSE AND THE SAFETY OF CHILDREN REPORTED TO CHILD PROTECTIVE SERVICES: A TALE OF SIX STATES

Overview

Differential response (DR) is an increasingly common model for how child protective services agencies address reports of child maltreatment. Differential response systems seek to be less adversarial than traditional child protective services by separating incoming referrals into two (or more) tracks. Families with low to moderate risk and safety threats (variously defined) are encouraged to accept and use prevention services, an approach referred to as alternative response (AR). Higher risk families receive the traditional, forensically oriented Investigative Response (IR) which includes the intent to determine whether or not there is evidence that a maltreatment incident occurred and to identify the perpetrator(s). A number of studies have evaluated DR programs and the practice is currently labeled “promising” by the California Evidence-Based Clearinghouse (2014). A number of quasi-experimental and experimental studies have demonstrated that similar safety results were obtained for children served in AR and IR tracks.

Jurisdictions vary widely in how frequently they use their alternative response tracks. This study sought to determine whether children in counties with higher rates of AR use are more or less likely to be re-reported to child protective services and and/or confirmed to have been victims of subsequent abuse or neglect. The study uses data from the National Child Abuse and Neglect Data System (NCANDS) to examine differences in county AR utilization rates for the six states that used differential response systems during the entire period from 2004 to 2013 (U.S. DHHS, 2015a). Analyses then explore the relationship between AR utilization rates and re-reporting as an indicator of child safety.

Key Findings

- 1) Overall, higher rates of alternative response were associated with lower re-reports and re-reports with substantiation (that is, a subsequent confirmation that the child had been victimized).
- 2) Among the six states, county rates of alternative response utilization averaged 45 percent, and 90 percent of counties utilized AR for between 6 percent and 77 percent of responses.
- 3) In three of six states higher rates of alternative response were associated with lower overall re-reports; in the other three states there was no association between utilization and re-reporting.
- 4) In five of six states, higher rates of alternative response were associated with lower re-reports with substantiation, and in the remaining state there was no association between utilization and re-reports with substantiation.

This research was conducted under contract to ASPE by researchers at the Kempe Center for the Prevention and Treatment of Child Abuse and Neglect at the University of Colorado, in collaboration with staff in HHS's Administration on Children, Youth and Families, Office of Data, Analysis, Research and Evaluation. Authors include John D. Fluke, Nicole Harlaar, Kurt Heisler, Adam Darnell, Brett Brown, and Lisa Merkel-Holguin.

What is Differential Response?

Every U.S. state offers at least one type of response to reports of child maltreatment that includes a determination of victimization, sometimes referred to as a substantiation disposition. Some states offer one or more alternative responses in addition to the common or investigation response and are characterized as Differential Response (DR) systems (Merkel-Holguin, Kaplan, & Kwak, 2006). The primary distinguishing feature of alternative responses is that they do not produce a formal determination of maltreatment, as investigation responses do. More generally, an alternative response may also be distinguished by using a less adversarial, strengths-based approach that gives families a role in decision-making, and a primary focus on providing services as opposed to making the case for removal of the child from the home or punishment for the parent or other perpetrator (Kaplan & Merkel-Holguin, 2008).

DR can be characterized as one of several engagement-enabling policies (Hollinshead et al., 2015). The basic rationale for DR is that child welfare systems respond to cases that range widely in terms of the risk and safety issues that families present, so systems should have more flexibility than a single investigation response can offer in responding to these diverse needs. Only a small minority of child protection investigations result either in the child's placement outside the home or in court action against the perpetrator. In addition, many families who are investigated by child protective services do not receive services beyond the investigation, even if the maltreatment was substantiated (U.S. DHHS, 2015a). According to the logic of DR, when risk and safety threats are not so imminent as to demand an investigative response, the generally less-adversarial approach of an alternative response is expected to lead to greater engagement by families in the child welfare system's efforts to promote child safety. This increased family engagement with child welfare is expected to lead to increased uptake of services to which families are linked. Engagement in services is then expected to lead to increased service effectiveness, and ultimately, improved outcomes such as child safety and family wellness.

Role of the U.S. Government in Differential Response

In 2008, given the interest and growth of DR throughout child welfare systems in the United States, the U.S. Department of Health and Human Services, Administration for Children and Families, Children's Bureau funded the National Quality Improvement Center on Differential Response in Child Protective Services (QIC-DR), which operated until 2014. The QIC-DR was structured to generate and disseminate knowledge on DR, and support the infrastructure at state and local levels to implement and evaluate DR, resulting in three state-level evaluations in Colorado, Illinois and Ohio, a cross-site evaluation, and 4 dissertations related to DR. All of these reports can be accessed at www.differentialresponseqic.org.

Of some importance, the reauthorization of the Child Abuse Prevention and Treatment Act (CAPTA) in 2010 included differential response provisions. The CAPTA Reauthorization Act (P.L. 111-320) specifies that differential response is an eligible use of basic state grant funds for improving child protective services. In addition, the legislation charged the Department of Health and Human Services (HHS) with addressing best practices in differential response through dissemination of information, research, and training of personnel. The reauthorization did not narrowly define differential response, but described it as "a state or community-determined formal response that assesses the needs of the child or family without requiring a determination of risk or occurrence of maltreatment. Such response occurs in addition to the traditional investigatory response." Accordingly, the Child Welfare Information Gateway, an information service sponsored by the Children's Bureau, has myriad publications about DR on their website (www.childwelfare.gov).

DR Implementation Variation across Jurisdictions

There is wide variation in the particular elements of DR systems across jurisdictions, including the number of response tracks, the timing of track assignment, and the criteria for track assignment, among others (Casey Family Programs, 2012; QIC-DR, 2013). As we illustrate below, jurisdictions within a given state vary widely in basic aspects of DR implementation, such as the percentage of screened-in referrals assigned to the alternative and investigative response tracks, suggesting a possible difference in the risk threshold from jurisdiction to jurisdiction for cases that receive an alternative response.

Existing Research on Differential Response

Differential Response systems have been subjected to a considerable range of quasi-experimental and experimental evaluation research. Research on DR has focused on three key questions. First, are children who are eligible for AR and whose families participate in the AR track as safe as or safer than eligible children whose families participate in the IR track? Second, how is the AR track different from the IR track in terms of family engagement, caseworker practice, and services provided? Third, what are the monetary implications for the child protection agency of implementation of a DR system? By and large, the results from experimental designs have found that safety, as measured by re-reporting, is not compromised by AR (Loman & Siegel, 2004, 2005, & 2013; Loman, Filonow, & Siegel, 2010; Ruppel, Huang, & Haulenbeek, 2011; Winokur et al. 2014; Merkel-Holguin et al. 2014; Fuller et al. 2014). Families served in the AR track have been found to be more cooperative, realistic, motivated, and have higher self-esteem compared with families in the IR track. Additionally, families served in the AR track show higher levels of positive emotional response to the intervention and higher levels of satisfaction and increased use of services, suggesting increased family engagement (Loman & Siegel, 2004 & 2013; Loman, Filonow, & Siegel, 2010; Merkel-Holguin et al, 2015; Hollinshead et al. 2015). Finally, DR has been found to be cost neutral (Winokur, et al. 2014; Fuller et al. 2014) or to result in cost savings (Loman & Siegel, 2004).

In this study we focus on differences in DR systems pertaining to assignment of cases to IR and AR tracks and how those differences relate to child safety. These differences can have important implications for DR effectiveness. As Siegel notes, “different criteria (more inclusive, less inclusive) will yield different populations of families who receive AR rather than IR and this, in turn, will affect the relative impact of introducing the multiple response approach into a child protection system” (Siegel, 2011). Previous studies have found large differences between state AR utilization rates; however, the reasons for these differences and their impact on system performance have not been studied.

A review carried out by Casey Family Programs (2012) found state AR utilization rates for statewide DR systems ranging from 43% to 74%. Citing other studies, Hughes and colleagues (2013) reported that AR utilization rates ranged from 47% to 71% across three states. Shusterman and colleagues (2005) found AR utilization rates for six states ranging from 20% to 71%. This same study examined annual changes in state AR utilization rates from 1998 to 2002 and found steady or increasing use. There are also considerable differences in AR utilization rates between counties in the same state. An evaluation of New York’s DR system found county AR utilization rates ranging from 28% to 66% (Ruppel et al., 2011). An evaluation of Minnesota’s DR system found county AR utilization rates ranging from 21% to 64% (Loman & Siegel, 2004), and a similarly wide range was found for Ohio (Loman, Filonow, & Siegel, 2010). Additionally, there is some support for the intuitive expectation that higher utilization of AR would be associated with higher risk and safety threats in the AR track. Loman and colleagues (2004) found in the evaluation of Minnesota’s DR system that higher county AR utilization was associated with a higher percentage of AR families with a safety issue indicated on the Structured Decision Making (SDM) safety assessment instrument.

In its simplest form, the logic of DR holds that child protective services should be allowed to respond more flexibly to families with different presenting problems. This logic implies the ability to identify which families are most appropriate for each type of response: either a traditional investigation or an alternative response, depending on the type of allegation and other considerations. Current research does not provide clear guidance on the types of cases most appropriate for each type of response nor the most effective assessment methods for identifying them. Further, the basis for the assignment to AR or IR is the information available to state hot-lines or county level intake hot-lines. Taken together these conditions contribute to the large differences in the percent of cases served in the AR track from one jurisdiction to the next.

The Present Study

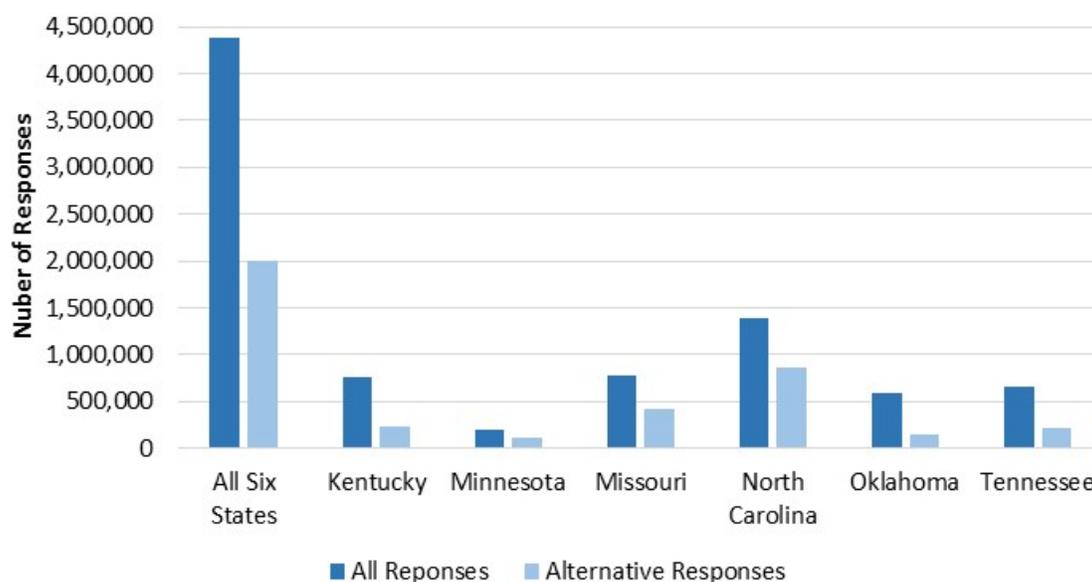
In the present study we explore these dynamics at the system level, examining the relationship between the risk of the populations served in AR and IR tracks and system-level re-reporting rates. Our primary question was whether more use of AR leaves children less safe? In order to examine this question we analyzed whether children were more or less likely to have any re-report or a substantiated re-report in counties that more frequently use their alternative response, regardless of whether the family received the alternative or a traditional

response. We analyzed county level data from the National Child Abuse and Neglect Data System (NCANDS) for the six states that used differential response statewide throughout the study period – federal fiscal years 2004-2013. While other states use DR, they did not do so statewide during the full decade we examined. Quasi-Poisson regression modelling was used to examine the correlation between the frequency of AR utilization and re-reporting. Potential differences in the risk profiles of those served by states’ CPS agencies were addressed analytically by controlling for other characteristics of the county such as poverty rates. The states included in the analysis were Kentucky, Minnesota, Missouri, North Carolina, Oklahoma, and Tennessee. Two of these states have state-supervised, county-administered child welfare systems (Minnesota and North Carolina) and the other four have state-administered child welfare systems (Child Welfare Information Gateway, 2012). Details regarding the analytical techniques used are presented in the appendix.

Six States’ Experience

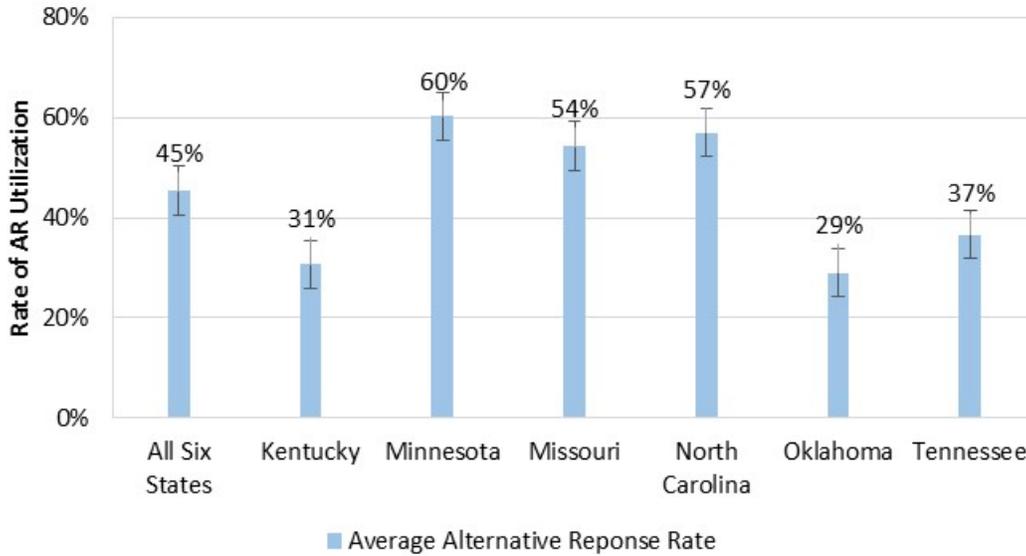
Figure 1 depicts the number of child-level responses for each of the six states in the study over the entire time period from the beginning of federal fiscal year 2004 to the end of 2013. In total the counts from the six states included over 4.3 million child-response events. Of these, 2.0 million responses were AR.

Figure 1. Child Abuse and Neglect Responses and AR Utilization (2004–2013)



Because our research question for this study is based on comparing counties and their experience with DR, the rest of our results presentation is based on county aggregate data. Figure 2 provides the average AR utilization rate for the counties in the six states and includes error bars showing the standard error of the estimate. Data for the analysis were drawn from between 488 and 584 counties for each federal fiscal year, resulting in a total of 5,587 observations of county AR utilization rates. While the average rate of AR utilization each year at the county level is 45%, there were differences in the average AR utilization rate across states; the lowest annual average AR utilization rate in Oklahoma was 29%, compared to the highest average AR utilization rate of 60% in Minnesota. Variation in AR utilization rates at the county level were also considerable, ranging from 0 percent to 100 percent utilization.

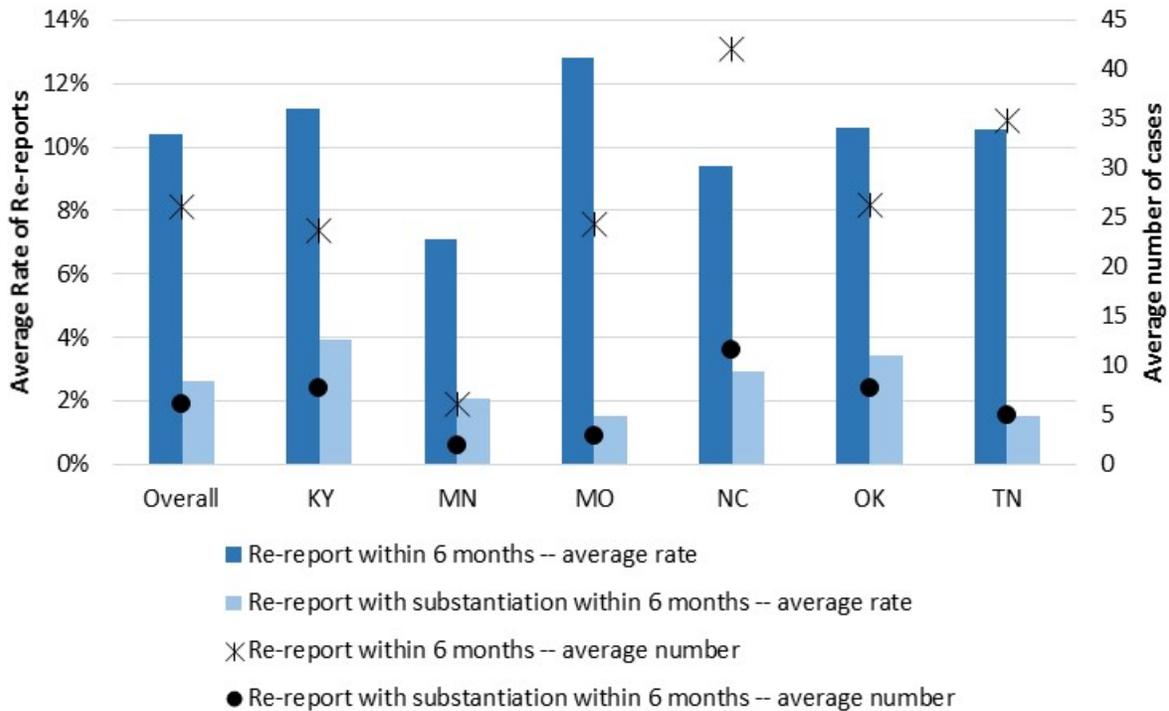
Figure 2. County Average Child Abuse and Neglect AR Utilization (2004–2013)



Child Safety

The concept of child safety is difficult to capture through administrative data such as NCANDS. However, re-reporting and re-reporting with substantiation are commonly used as the best available indicators of safety. While interpretation of re-reporting is confounded by many systemic factors (Fluke, et al. 2008), it may be that re-reporting events reflect less serious safety concerns compared to re-reports that are substantiated.

Figure 3. Average County-Year Re-report Rate (%) and Number

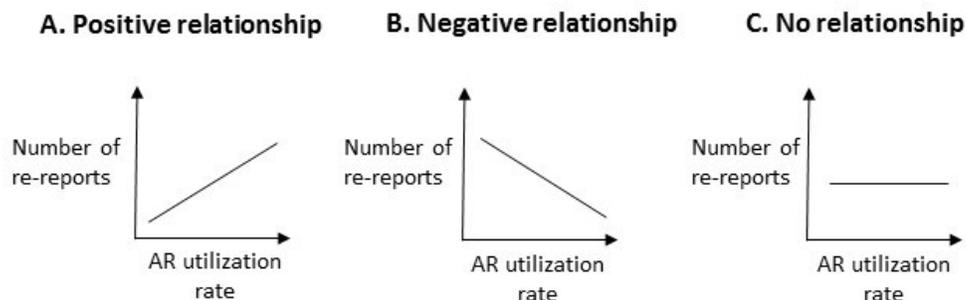


Average county-year rates of re-report and re-reports with substantiation across all six states and for each of the six states separately are shown graphically in Figure 3. From the figure it is clear that average rates and numbers of re-reports are considerably more common compared to re-reports with substantiation. On average, *rates* of re-reporting are three times greater compared to re-reports with substantiation, and average *counts* of re-reports are more than four times greater compared to counts of re-reports with substantiation.

Is Child Safety Related to the Use of Alternative Response?

To address this question we examined the statistical relationship between AR utilization rates and numbers of re-reports and re-reports with substantiation aggregated at the county-year level. This relationship could take one of three forms. First, there could be a positive relationship (Figure 4A): counties with high AR utilization rates could have higher numbers of re-reports and/or re-reports with substantiation compared to counties with lower AR utilization rates. This would be consistent with the idea that in these counties the increased use of AR results in the use of AR for cases at such high risk that AR cannot keep them as safe as an investigation might have, resulting in increased re-reporting as AR utilization increases. Second, there could be a negative relationship (Figure 4B): counties with high AR utilization rates could have lower numbers of re-reports and/or re-reports with substantiation compared to counties with lower AR utilization rates. This would be consistent among other explanations with the idea that effective family engagement and service provision (or another unspecified mechanism) results in decreased re-reporting as AR utilization increased. Third, there may be no relationship (Figure 4C): numbers of re-reports and/or re-reports with substantiation do not differ systematically for counties with high AR utilization rates compared to counties with low AR utilization rates.

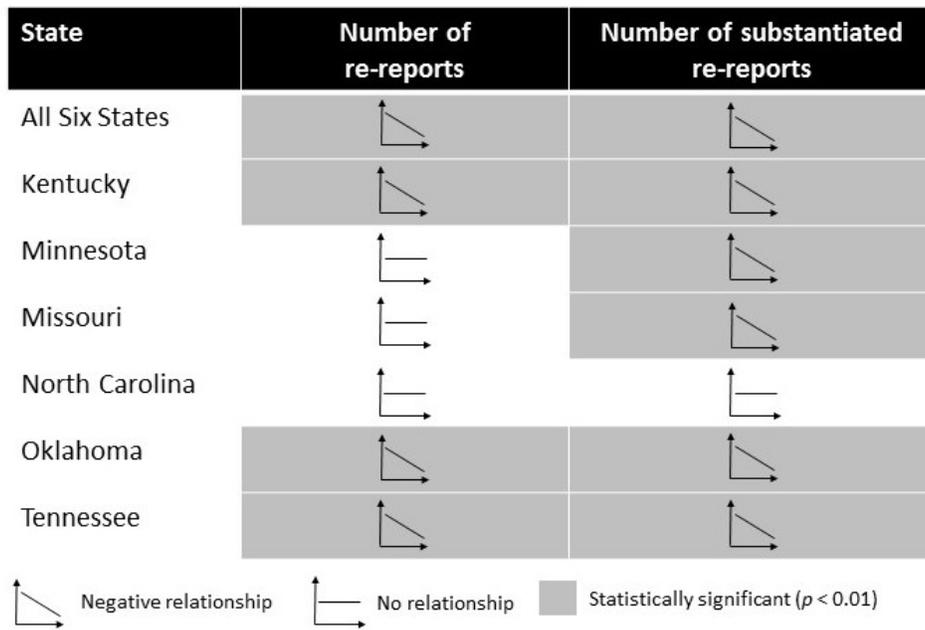
Figure 4. Types of Relationships with AR Utilization Rate and Number of Re-Reports (or Substantiated Re-Reports)



Of course, evidence for a relationship (positive or negative) does not necessarily mean that AR utilization and number of re-reports or substantiated re-reports are causally related; such a relationship can only be determined with a controlled study. However, we sought to rule out factors that could account for (confound) the association between AR utilization and number of re-reports or substantiated re-reports by controlling for the following factors in the analysis: year, total population, total number of children under age five years, percentage of population identifying as White, median household income, percentage of households with under 18 year olds in poverty, and total number of child maltreatment reports.

We ran analyses separately for each state using quasi-Poisson regression modeling, as well as for the six states overall (where state was included as a control variable). Results from our analyses are summarized in Figure 5, and full details of the analyses and results are provided in the Appendix (Tables 1 and 2). We used an extremely conservative cutoff to determine statistical significance ($\alpha \leq .01$). Three of the 6 states, Kentucky, Oklahoma, and Tennessee, showed a significant negative relationship between AR utilization and number of re-reports, while the remaining three states showed no relationship. In addition, all states except Missouri showed a significant negative relationship between AR utilization and number of substantiated re-reports. In no state was a positive relationship detected for either measure. Thus, in general, counties with higher AR utilization rates had lower numbers of re-reports and lower numbers of substantiated re-reports compared to counties with lower AR utilization rates.

Figure 5. Direction of Relationship between AR Utilization Rate and Numbers of Re-Reports and Substantiated Re-Reports

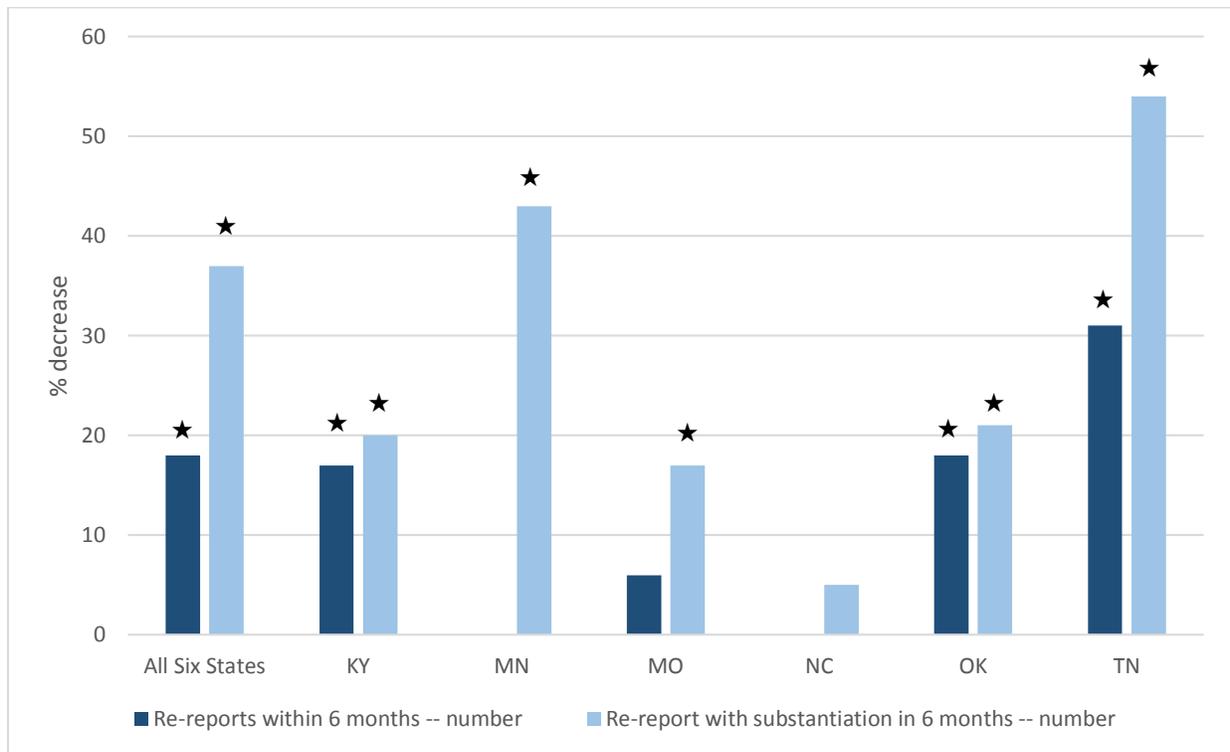


Although the six states showed considerable consistency among their counties in the direction of the relationship between AR utilization rates and numbers of re-reports and re-reports with substantiation, the magnitude of the relationship varied across states. The effect sizes for each state are shown in Figure 6, expressed as the percentage decrease in re-reports and re-reports with substantiation between counties with lower (below median) and higher (above median) rates of AR utilization.

In terms of overall re-reports across all six states (dark blue bars in Figure 6), there were 18% fewer re-reports in counties with AR utilization rates above the median relative to counties with AR utilization rates below the median. Consistent with the pattern of results shown in Figure 5, Minnesota, North Carolina, and Missouri showed the least difference in number of re-reports between counties with AR utilization rates above and below the median. Tennessee showed the largest difference: counties with AR utilization rates above the median in Tennessee had 31% fewer re-reports compared with Tennessee counties with AR utilization rates below the median.

Reductions in the number of re-reports with substantiation in counties with AR utilization rates above the median are even more striking (light blue bars in Figure 6). Across all six states, there were 37% fewer substantiated re-reports in counties with AR utilization rates above the median relative to counties with AR utilization rates below the median. In North Carolina, the only state that does not show a statistically significant relationship between AR utilization rate and number of re-reports with substantiation (Figure 5), counties with AR utilization rates above the median show just 5% fewer substantiated re-reports compared with counties in North Carolina with AR utilization rates below the median. In contrast, counties in Tennessee with AR utilization rates above the median had 54% fewer substantiated re-reports compared with Tennessee counties with AR utilization rates below the median.

Figure 6. Decrease (%) in Numbers of Re-Reports and Substantiated Re-Reports in Counties with Higher vs. Lower AR Utilization Rates



★ Statistically significant decrease in expected number of re-reports of being in a county with an AR utilization rate above the median for the state compared with being in a county with an AR utilization rate below the median for that state.

Interpretations and Implications

The focus of this study was to assess the impact of DR policy as it has been implemented over the past decade among states with the most experience in DR implementation. We looked at rates of AR use at the county level, confirming that considerable variability is present in levels of use both from state to state as well as from county to county.

To explore DR’s effect on children we examined several child safety outcomes in the form of re-reporting and re-reporting with substantiation within six months of the initial report. These measures of re-reporting can be contrasted with maltreatment recurrence which is defined as substantiated maltreatment that is followed by a subsequent substantiated maltreatment; this is the basis for the federal Child and Family Service Review standards used to assess state performance. Because by definition AR cases are not substantiated, there would be no basis for observing recurrence among these cases, thus recurrence would not apply. So, while recurrence is not an appropriate measure of safety for this study, re-reports are acknowledged as an important contextual indicator of child safety (U.S.DHHS, 2015b).

The findings from the study show that higher rates of AR use in states with differential response are not associated with an increased risk of re-reporting or re-reporting with substantiation. Further, for three states, counties have comparatively lower re-reporting in the presence of higher rates of AR use. Similarly, for five of six states, counties have lower re-reporting with substantiation among counties with comparatively higher rates of AR use. Thus, in general, counties with higher AR utilization rates are associated with lower numbers of children experiencing re-reports and re-reports with substantiation compared with counties with lower utilization rates.

The findings of this study are applicable only to the six states we examined; the implementation experiences of other states could be different. Further, the results are based on statistical associations and explanations for these findings could be due to multiple factors that we were not able address with the available data. There is also a likely limit on the rate of AR utilization above which potential safety changes cannot be determined. Such a

limit was not explored here. Nevertheless, these results suggest that, in general, DR practice for states and counties included in this study did not contribute to additional child safety concerns and for some may have improved overall levels child safety based on re-reporting. Certainly further research is warranted to achieve a clearer understanding of the mechanisms behind our findings and its implications for improving child safety. Future research should also explore additional and more direct outcome measures of safety, as well as a broader set of child well-being outcomes (health, cognitive, social) than is currently available through existing federal administrative data.

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Appendix: Is Child Safety Related to the Use of Alternative Response?

To address this question, we examined the statistical relationship between AR utilization rates and numbers of re-reports and re-reports with substantiation at the county year level. We assume that the decision to provide an AR response can be represented as the collective jurisdictional average decision-maker threshold (Baumann, Fluke, Dalglish, & Kern, 2014) to provide an AR response—that is, the rate of AR utilization. Because this decision threshold varies, rates of AR utilization from jurisdiction to jurisdiction allow correlation analysis to assess whether safety outcomes also vary with AR utilization. Poisson regression was used because it has some statistical advantages when analyzing count data which is the basis for the information in the NCANDS county level data set used in the analysis (Wulczyn, Gibbons, Snowden, & Lery, 2013).

If assumptions about AR implementation are being met, more AR utilization may be better from an overall safety perspective. However, this is complicated since the most appropriate level of AR utilization may be different from one jurisdiction to the next depending on differences in the risk profile of the underlying population served by the CPS agency. This was addressed analytically by controlling for other characteristics of the counties, such as poverty rates.

The National Child Abuse and Neglect Data System (NCANDS) Child File was accessed for the analysis. This NCANDS Child File consists of child-level data for all children involved in maltreatment reports that are investigated or assessed by state or county child protective services (CPS) agencies (i.e., screened-in reports; U.S. DHHS, 2015b). Records are provided per child, per response.

Six states were selected on the basis of having implemented statewide differential response policy throughout the period of study—federal fiscal years 2004 through 2013—consistent with the DR model components defined by the QIC-DR. While other states have implemented or partially implemented DR, no other states met these criteria for the full time period. The states included in the analysis were Kentucky, Minnesota, Missouri, North Carolina, Oklahoma, and Tennessee. Two of these states have state-supervised, county-administered child welfare systems (Minnesota and North Carolina) and the other four have state-administered child welfare systems (Child Welfare Information Gateway, 2012).

For the analysis the child level NCANDS data were assembled at the county level for each year as counts and rates of children who were the subject of a child protection response. For this study we were able to use data for all counties in the six states. County-year aggregations included counts of children who received a response, counts by response type (AR or IR), and rates of response type. Safety outcomes included counts of six month re-reports and re-reports with substantiation, rates of overall re-reporting and re-reporting with substantiation, and rates by type of initial response. Re-reports and re-reports with substantiation were calculated based on the occurrence of a second report among children initially reported within the first six months of the fiscal year, falling at least 24 hours after the initial report. In addition, county-level demographic and socio-economic status data from the American Community Survey and Small Area Income and Poverty Estimates (U.S. Census Bureau, 2014a & 2014b) were incorporated into the data set, to account for county population differences that could affect both AR utilization rates and re-reporting rates.

Initial Poisson regression models indicated that the outcomes were over dispersed (i.e., variance was much larger than the mean, or the expected count, of re-reports and substantiated re-reports). Consequently, we used quasi-Poisson regression models. The primary predictor of interest was AR utilization rate. Additionally, we included the following variables as covariates: year, total population in 2013, total number of children under five years in 2013, percentage of population identifying as White in 2013, median household income, percentage of households with children under age 18 in poverty, and total number of reports.

We ran analyses separately for each state using quasi-Poisson regression modeling, as well as for the six states overall (where state was included as a predictor of re-reports). We set the statistical significance level at $\alpha \leq .01$, adopting a conservative criteria for determining the importance of these relationships. Results for number of re-reports are shown in Tables 1 (each state) and 2 (six states overall), and results for number substantiated re-reports are shown in Tables 3 (each state) and 4 (six states overall). Analyses were conducted in the *R* statistical environment (version 3.2.3).

Table 1. Prediction of Average County Year Re-Report Counts for the Six States Overall and Separately by State

	<i>Coeff.</i>	<i>SE</i>	<i>Std. coeff.</i>	<i>t</i>	<i>p</i>	<i>IRR</i>	<i>IRR 95% CI</i>
<i>Six states overall</i>							
<i>AR utilization rate</i>	-.55	.05	-.003	-10.97	<.01	.56	.52, .64
<i>State: KY</i>	-.31	.04	-.002	-8.34	<.01	.74	.68, .79
<i>State: MN</i>	-1.35	.07	-.009	-20.41	<.01	.26	.23, .29
<i>State: MI</i>	-.16	.04	-.001	-4.08	<.01	.85	.79, .92
<i>State: NC</i>	.04	.04	.000	1.18	.24	1.05	.97, 1.13
<i>State: OK</i>	-.29	.04	-.002	-7.04	<.01	.75	.69, .81
<i>Year</i>	-.09	.01	-.004	-17.13	<.01	.91	.91, .92
<i>Total population 2013</i>	.00	.00	.013	17.27	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.015	-18.06	<.01	1.00	1.00, 1.00
<i>Percent white 2013</i>	.00	.00	-.001	-2.41	.02	1.00	1.00, 1.00
<i>Median household income</i>	.00	.00	.004	7.64	<.01	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	.00	.00	.000	.03	.98	1.00	.99, 1.01
<i>Total reports</i>	.00	.00	.010	43.38	<.01	1.00	1.00, 1.00
<i>Kentucky</i>							
<i>AR utilization rate</i>	-.83	.18	-.003	-4.58	<.01	.44	.30, .62
<i>Year</i>	-.04	.01	-.002	-3.87	<.01	.96	.94, .98
<i>Total population 2013</i>	.00	.00	-.030	-4.54	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	.011	1.68	<.09	1.00	1.00, 1.00
<i>% white 2013</i>	-.02	.01	-.002	-3.75	<.01	.98	.97, 1.00
<i>Median household income</i>	.00	.00	.002	1.59	.11	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	-.01	.01	-.002	-1.74	.08	.99	.98, 1.00
<i>Total reports</i>	.00	.00	.025	22.41	<.01	1.00	1.00, 1.00
<i>Minnesota</i>							
<i>AR utilization rate</i>	-.48	.20	-.009	-2.40	.02	.61	.42, .92
<i>Year</i>	-.12	.02	-.034	-7.31	<.01	.89	.86, .92
<i>Total population 2013</i>	.00	.00	.012	.53	.60	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.049	-2.29	.02	1.00	1.00, 1.00
<i>% white 2013</i>	-.01	.01	-.003	-.85	.40	.99	.98, 1.01
<i>Median household income</i>	.00	.00	.041	8.13	<.01	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	.04	.01	.019	3.15	<.01	1.04	1.01, 1.06
<i>Total reports</i>	.00	.00	.073	17.73	<.01	1.00	1.00, 1.00
<i>Missouri</i>							
<i>AR utilization rate</i>	-.25	.27	-.000	-0.91	.36	.78	.46, 1.33
<i>Year</i>	-.15	.01	-.009	-15.59	<.01	.86	.84, .87
<i>Total population 2013</i>	.00	.00	.019	9.20	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.026	-10.21	<.01	1.00	1.00, 1.00
<i>% white 2013</i>	-.01	.00	-.000	-2.30	<.01	.99	1.00, 1.00
<i>Median household income</i>	.00	.00	.008	8.95	<.01	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	.01	.01	.002	2.09	.04	1.01	1.00, 1.02
<i>Total reports</i>	.00	.00	.015	22.69	<.01	1.00	1.00, 1.00

(continued)

Table 1. Prediction of Average County Year Re-Report Counts for the Six States Overall and Separately by State (continued)

	<i>Coeff.</i>	<i>SE</i>	<i>Std. coeff.</i>	<i>t</i>	<i>p</i>	<i>IRR</i>	<i>IRR 95% CI</i>
North Carolina							
<i>AR utilization rate</i>	.03	.09	.000	.34	.73	1.03	.86, 1.23
<i>Year</i>	-.15	.02	-.007	-9.49	<.01	.86	.84, .89
<i>Total population 2013</i>	.00	.00	.016	6.29	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.020	-7.53	<.01	1.00	1.00, 1.00
<i>% white 2013</i>	.00	.00	-.001	-1.40	.05	1.00	1.00, 1.00
<i>Median household income</i>	.00	.00	.002	1.93	.16	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	-.01	.01	-.001	-.87	.38	.99	.98, 1.01
<i>Total reports</i>	.00	.00	.011	20.47	<.01	1.00	1.00, 1.00
Oklahoma							
<i>AR utilization rate</i>	-.84	.15	-.002	-5.44	<.01	.43	.32, .58
<i>Year</i>	-.14	.01	-.006	-10.38	<.01	.87	.85, .90
<i>Total population 2013</i>	.00	.00	.051	12.91	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.048	-11.37	<.01	1.00	1.00, 1.00
<i>% white 2013</i>	-.03	.00	-.004	-7.34	<.01	.97	.96, .98
<i>Median household income</i>	.00	.00	.002	2.14	.03	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	.00	.01	.000	0.52	.60	1.00	.99, 1.02
<i>Total reports</i>	.00	.00	.005	8.34	<.01	1.00	1.00, 1.00
Tennessee							
<i>AR utilization rate</i>	-.91	.11	-.004	-8.44	<.01	.40	.33, .50
<i>Year</i>	.09	.01	.003	7.34	<.01	1.10	1.07, 1.13
<i>Total population 2013</i>	.00	.00	.019	6.35	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.029	-6.72	<.01	1.00	1.00, 1.00
<i>% white 2013</i>	.01	.00	.001	2.40	.02	1.01	1.00, 1.01
<i>Median household income</i>	.00	.00	-.000	-.15	.88	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	-.03	.01	-.003	-3.75	<.01	.97	.96, .99
<i>Total reports</i>	.00	.00	.010	23.39	<.01	1.00	1.00, 1.00

NOTE: For six states overall, TN is reference State category. Coeff: unstandardized coefficient; SE: standard error; Std. coeff.: standardized coefficient; IRR: Incidence risk ratio; CI: Confidence interval

Table 2. Prediction of Average County Year Substantiated Re-Report Counts for the Six States Overall and Separately by State

	<i>Coeff.</i>	<i>SE</i>	<i>Std. coeff.</i>	<i>t</i>	<i>p</i>	<i>IRR</i>	<i>IRR 95% CI</i>
<i>Six states overall</i>							
<i>AR utilization rate</i>	-.82	.06	-.014	-13.66	<.01	.44	.39, .50
<i>State: KY</i>	.44	.05	.013	8.75	<.01	1.55	1.41, 1.71
<i>State: MN</i>	-.66	.08	-.017	-8.27	<.01	.52	.44, .61
<i>State: MI</i>	-.41	.06	-.012	-6.61	<.01	.66	.58, .75
<i>State: NC</i>	.70	.05	.019	13.53	<.01	2.01	1.82, 2.23
<i>State: OK</i>	.32	.05	.008	5.86	<.01	1.37	1.24, 1.53
<i>Year</i>	-.12	.01	-.023	-17.64	<.01	.89	.88, .90
<i>Total population 2013</i>	.00	.00	.043	11.65	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.046	-11.68	<.01	1.00	1.00, 1.00
<i>Percent white 2013</i>	.00	.00	.000	.37	.71	1.00	1.00, 1.00
<i>Median household income</i>	.00	.00	.011	4.91	<.01	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	.00	.00	-.002	-.82	.42	1.00	.99, 1.01
<i>Total reports</i>	.00	.00	.032	30.67	<.01	1.00	1.00, 1.00
<i>Kentucky</i>							
<i>AR utilization rate</i>	-1.05	.21	-.011	-5.00	<.01	.35	.23, .53
<i>Year</i>	-.06	.01	-.010	-4.90	<.01	.94	.93, .97
<i>Total population 2013</i>	.00	.00	-.101	-4.79	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	.048	2.24	.03	1.00	1.00, 1.00
<i>% white 2013</i>	-.02	.01	-.007	-3.86	<.01	.98	.97, .99
<i>Median household income</i>	.00	.00	.004	.86	.39	1.00	.99, 1.00
<i>Poverty percent under age 18</i>	-.02	.01	-.010	-2.31	.02	.98	.97, 1.00
<i>Total reports</i>	.00	.00	.071	19.90	<.01	1.00	1.00, 1.00
<i>Minnesota</i>							
<i>AR utilization rate</i>	-2.45	.27	-.115	-9.14	<.01	.09	.05, .15
<i>Year</i>	-.14	.02	-.106	-6.10	<.01	.87	.83, .91
<i>Total population 2013</i>	.00	.00	.164	2.08	.04	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.206	-2.81	.01	1.00	1.00, 1.00
<i>% white 2013</i>	-.01	.01	-.009	-.60	.55	.99	1.00, 1.00
<i>Median household income</i>	.00	.00	.094	5.17	<.01	1.00	.98, 1.01
<i>Poverty percent under age 18</i>	.04	.02	.050	2.23	.03	1.04	1.00, 1.01
<i>Total reports</i>	.00	.00	.148	9.85	<.01	1.00	1.00, 1.00
<i>Missouri</i>							
<i>AR utilization rate</i>	-1.23	.40	-.015	-3.05	<.01	.29	.13, .64
<i>Year</i>	-.27	.02	-.101	-17.91	<.01	.76	.74, .78
<i>Total population 2013</i>	.00	.00	.145	7.23	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.196	-7.98	<.01	1.00	1.00, 1.00
<i>% white 2013</i>	.00	.00	-.000	-.09	.93	1.00	1.00, 1.01
<i>Median household income</i>	.00	.00	.051	6.06	<.01	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	.01	.01	.014	1.49	.14	1.01	1.00, 1.03
<i>Total reports</i>	.00	.00	.107	16.99	<.01	1.00	1.00, 1.00

(continued)

Table 2. Prediction of Average County Year Substantiated Re-Report Counts for the Six States Overall and Separately by State (continued)

	<i>Coeff.</i>	<i>SE</i>	<i>Std. coeff.</i>	<i>t</i>	<i>p</i>	<i>IRR</i>	<i>IRR 95% CI</i>
North Carolina							
<i>AR utilization rate</i>	-.19	.11	-.003	-1.78	.08	.82	.66, 1.02
<i>Year</i>	-.17	.02	-.025	-8.78	<.01	.84	.81, .88
<i>Total population 2013</i>	.00	.00	.038	3.84	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.044	-4.26	<.01	1.00	1.00, 1.00
<i>% white 2013</i>	.00	.00	.002	0.73	.47	1.00	1.00, 1.00
<i>Median household income</i>	.00	.00	.003	0.75	.46	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	-.02	.01	-.006	-1.37	.17	.98	.96, 1.01
<i>Total reports</i>	.00	.00	.030	14.82	<.01	1.00	1.00, 1.00
Oklahoma							
<i>AR utilization rate</i>	-.86	.19	-.008	-4.46	<.01	.42	.29, .62
<i>Year</i>	-.12	.02	-.019	-7.31	<.01	.89	.86, .92
<i>Total population 2013</i>	.00	.00	.143	8.40	<.01	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.134	-7.37	<.01	1.00	1.00, 1.00
<i>% white 2013</i>	-.03	.00	-.013	-6.78	<.01	.97	.96, .98
<i>Median household income</i>	.00	.00	.000	.08	.94	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	-.01	.01	-.004	-1.36	.17	.99	.97, 1.01
<i>Total reports</i>	.00	.00	.017	6.64	<.01	1.00	1.00, 1.00
Tennessee							
<i>AR utilization rate</i>	-.94	.15	-.050	-12.61	<.01	.14	.11, .19
<i>Year</i>	.07	.02	.015	4.00	<.01	1.07	1.04, 1.11
<i>Total population 2013</i>	.00	.00	.061	2.25	.03	1.00	1.00, 1.00
<i>Count under age 5 2013</i>	.00	.00	-.065	-2.41	.02	1.00	1.00, 1.00
<i>% white 2013</i>	.02	.01	.028	4.53	<.01	1.02	1.01, 1.03
<i>Median household income</i>	.00	.00	-.001	-.21	.83	1.00	1.00, 1.00
<i>Poverty percent under age 18</i>	-.02	.01	-.015	-2.18	.03	.98	.96, 1.00
<i>Total reports</i>	.00	.00	.070	19.06	<.01	1.00	1.00, 1.00

NOTE: For six states overall, TN is reference State category. Coeff: unstandardized coefficient; SE: standard error; Std. coeff.: standardized coefficient; IRR: Incidence risk ratio; CI: Confidence interval