TEMPORAL AND REGIONAL STABILITY IN FACTORS ASSOCIATED WITH CHILD WELFARE REFERRALS TO FAMILY SERVICES

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Few studies investigate the impact of the policy context on service provision in child welfare. This lack of research was addressed by examining trends of family service rates for their temporal stability over a period of marked economic change. Multi-level analyses were applied to administrative child welfare data from Arizona, Tennessee and Texas. Years included were 2007, 2008 and 2009 with each year covering around 450,000 reports per child and date. The impact of case characteristics on referrals to family services varied slightly between years. The impact of the regional context, however, differed. Not only was there a marked difference in the level of family services rate between states but also different directions for trends of family services rate across years: The service rate differential across the three states dropped from a ten-fold difference in services offered per capita to a three-fold difference. Restricting financial resources on the level of the child welfare system is likely to have an impact on service provision as the dramatic decline of family services in one state indicates.
Over 3 million maltreatment reports were investigated by child protection services (CPS) in 2011 across the United States (U.S. Department of Health and Human Services, 2012), and over a million of these investigations led to a CPS service. Within the first 90 days of the investigation, 20 percent of the services provided involved an out-of-home placement while the remaining 80 percent involved a referral to a service while the child remained in the home. While there is a growing body of research on service decisions related to out-of-home placement, far less research has examined the factors associated with referrals to in-home family services. The few studies that have examined decisions to provide family services have focused on the effect of case-level factors, such as child and caregiver socio-demographics, caregiver risks, or form of maltreatment and level of substantiation (e.g. Barth, 2005; Casanueva, Cross, & Ringeisen, 2008; DePanfilis & Zuravin, 2001; Hurlburt, Barth, Leslie, Landsverk, & McCrae, 2007). Broader CPS agency or state-level factors that determine the types of family services offered and their availability have not, however, been examined. Fiscal constraints and the overall level of demand for services relative to poverty, unemployment or other socio-demographic factors, may also impact the allocation of family services.

The Great Recession (GR) provides a unique opportunity to examine how variation in state and county-level revenues and expenditures may have affected the provision of family services through the CPS system. These exceptionally dramatic variations in county- and state-level capacity to support the demand for family services provide a natural quasi-experimental design for studying the relationship between case-, county- and state-level factors. Using multi-level models which are capable of partitioning the variance of referral to services into variance on the individual and on the broader contextual level (e.g. Rabe-
Hesketh & Skrondal, 2008), this study examines how trends in child welfare referrals to services varied during the GR across three large states with differing levels of investment in child welfare services.

The paper is organized as follows. The next section provides information on referrals to family services, county-level factors associated with referrals to family services, and contextual information on the states included in this analysis (Texas, Arizona, and Tennessee). The Methods section describes the data, variables, and analytic procedure. The Findings are then presented, and the paper concludes with a Discussion section including policy implications.

**Referral to family services**

Referrals to family services may include interventions provided in-home, but also in agency settings, to groups or individuals, with varying scope, content, and intensity (Barth et al., 2005; Downs, Moore, & McFadden, 2009; Hurlburt et al., 2007; Kaminski, Valle, Filene, & Boyle, 2008). Family services can include training and therapeutic elements, counseling and concrete services. Among family services, intensive family preservation refers to services aiming to avert the imminent child placement, usually provided in-home with a high quantity of sessions over a limited period of time (e.g., Downs et al., 2009). Services include counseling or therapy, teaching skills and concrete tasks (such as cleaning the apartment or driving to the grocery store with the family members).

The decision to support a maltreated child in their home and other decisions in child welfare are dependent on a complex interplay of case characteristics, and factors not directly related to the case such as organizational characteristics, regional setting or social structural context (e.g., Baumann, Dalgleish, Fluke, & Kern, 2011; Wulczyn, Chen, &
Courtney, 2011). Few studies have addressed the impact of case characteristics on referrals to family services. Casanueva et al. (2008) reported an association between substantiation status and an individualized family service plan; DePanfilis and Zuravin (2001) described an impact of previous substantiated report on opening of services; and Hurlbert et al. (2007) scrutinized referrals to parent training and identified poor parenting, caregiver substance use, domestic violence, neglect as predictors of referral. On a county or state level, differences in service rates may not only indicate real differences in need but may also vary because of differences in policy, programs or resource allocation (cf. Drake & Jonson-Reid, 2000; Straus & Moore, 1990; Wulczyn, 2009).

**County- and state-level factors associated with referrals to family services**

States and local governments differ in a number of areas related to child welfare service delivery. One of the most glaring variations is public funding. A recent study showed that state-level child welfare expenditures were strongly and negatively associated with child maltreatment outcomes, e.g., more expenditures were associated with decreased substantiation rates (Malcolm, 2012). However, this relationship has become much more complex in the past five years as state governments have responded to severe budget shortfalls due mostly to the 2008 Great Recession (GR).

Most states have experienced decreased revenue due to the GR. In 2009, 29 states confronted a total budget shortfall of $48 billion (McNichol & Lav, 2008). The vast majority of states have made cuts to their social service budgets and therefore various aspects of service delivery are likely challenged in the current macroeconomic context (e.g., Harper, Jones, Mckay, & Espey, 2009). With lower than expected economic growth, less tax revenue, many states have reduced spending which is likely to negatively affect the
Child welfare referrals to family services

supply of services. Alternatively, child welfare service delivery might be influenced by other factors than state expenditures. When economic hardship is widespread (e.g., the relatively high unemployment rate), more children may be at risk for neglect and maltreatment (Coulton, Crampton, Irwin, Spilsbury, & Korbin, 2007; Jones, Finkelhor, & Halter, 2006). Consequently, some have suggested the GR might have led to an increased demand on the child welfare systems (cf. Malcolm, 2012). The multiple and complex associations between economic deprivation and child maltreatment has been debated in the theoretical and empirical literature (e.g., Drake & Zuravin, 1998; Garbarino & Kostelny, 1992; Millett, Lanier, & Drake, 2011). Well-known is the theoretical linkage of economic hardship and child maltreatment through stress: High levels of stress, alone or moderated by other factors, such as parental belief in discipline, may increase the risk for child maltreatment (Crouch & Behl, 2001). Economic deprivation increases stress and is likely to negatively influence parental emotional well-being and parenting practices (Conger, Reuter, & Conger, 2009). Deprivation and stress may lead to neglect by preventing parents from providing the adequate care necessary for a healthy environment for children's development (Berger, 2004). Theories regarding child maltreatment and community-level risk factors consider that poor communities often lack parenting support, which could help moderate stress at home (Coulton et al., 2007; Garland & Besinger, 1997).

Another explanation of referrals to family services is that increased incidence rates of maltreatment or heightened attention of policy-makers might increase child welfare expenditures (Malcolm, 2012). However, it is fairly likely that lags in policy development and implementation would preclude immediate expenditure increases in response to rising abuse rates (Malcolm, 2012; Millett et al., 2011). The supply of family services across
states varies to the extent in which services depend on the level of expenditures. This dynamic can be considered the elasticity of supply of family services (Samuelson & Nordhaus, 2000). Low expenditure states with social services budgets already at low levels might have little choice than to increase service supply to meet the increased basic demands. In other jurisdictions, when expenditures increase and the supply of services increases slowly the situation is considered inelastic. In this case, states can cut expenditures without affecting the level of services.

Besides an association with the economy, changes in service referrals might be associated with variation in state-level legislation about how to respond to reported child endangerment. Apart from investigating alleged child maltreatment, a growing number of states now rely on differential response systems with an assessment alternative for low- and moderate-risk cases, focusing on the family’s strengths and needs (Kaplan & Merkel-Holguin, 2008; National Quality Improvement Center on Differential Response in Child Protective Services, 2009). Further possible influences on a contextual level have been discussed in the literature: the overrepresentation of minorities and racial/ethnic disparity at different decision points in child welfare is a well-known finding (e.g., Drake, Lee, & Jonson-Reid, 2009; Kim, Chenot, & Ji, 2011). Urban-rural differences in accessibility and availability of services are likely to affect their provision (e.g., Belanger & Stone, 2008) and there is evidence for increased likelihood of placement in metropolitan environments (Fluke, Chabot, Fallon, MacLaurin, & Blackstock, 2010; Wulczyn, Hislop, & Harden, 2002). However, for a Canadian sample, location of an agency in a metropolitan area did not increase the odds of service referral while the probability of service referral varied with provincial setting (Jud, Fallon, & Trocmé, 2012).
Background on Arizona, Tennessee, and Texas

We illustrate state level differences by comparing information on child welfare systems in Arizona, Tennessee, and Texas for the years 2005 to 2010. Based on a 2005 legislative mandate, Tennessee implemented a statewide differential response approach in all regions by April 2009 (Tennessee Department of Children’s Services, 2009). Both Arizona and Texas had started differential response pilot projects; the pilot project in Arizona was terminated in 2010 (National Conference of State Legislatures, 2012). However, both states had introduced or maintained other family-centered practice models in recent years. In Arizona, family-centered practice models comprise the Healthy Families Arizona program, a community-based, multi-disciplinary program serving pregnant women and families of newborns. Another approach is the use of Family Connections Teams that were developed in 2005 to reduce poverty and family violence by better integrating the Department’s human service programs and Family Group Decision Making (FGDM) (Arizona Department of Economic Security, 2007, 2008). Texas, too, is embracing FDGM as an approach to a more family-focused philosophy (Texas Department of Family and Protective Services, 2007).

State funding varied widely between these states (see Table 1). From 2006 to 2008, total child welfare expenditures from state funds in Arizona increased by 25% and corresponded to $154 per child in the 2008 total child population (State Child Welfare Policy Database, 2010a). However, between 2008 and 2010, child welfare expenditures from state funds decreased by 13% (State Child Welfare Policy Database, 2010b) and Arizona’s tax revenues continually decreased with a difference of 22% between 2007 and 2009 (U.S. Census Bureau, 2009a, 2009b, 2010). In 2008, state child welfare expenditures
Child welfare referrals to family services

in Arizona correspond to 2.01% of state tax revenues. Changes were less pronounced in Tennessee (State Child Welfare Policy Database, 2010c, 2010d): Total child welfare expenditures from state funds decreased by 3% between 2006 and 2008; another decrease by 9% took place between 2008 and 2010. Tennessee state tax revenues decreased by 8% from 2007 to 2009 (U.S. Census Bureau, 2009a, 2009b, 2010). In 2008, the child welfare expenditures from state funds corresponded to $197 per child in the 2008 total child population and to 2.54% of state tax revenues. Contrary to the two other states, Texas total child welfare expenditures from state funds increased by 19% from 2006 to 2008 and again by 22% from 2008 to 2010 (State Child Welfare Policy Database, 2010e, 2010f). State tax revenues increased by 12% from 2007 to 2009 (U.S. Census Bureau, 2009a, 2009b, 2010). Even if state tax revenues decreased again in 2009, the difference between 2007 and 2009 still corresponds to an increase of 3%. Texas state child welfare expenditures in 2008 correspond to 0.95% of state tax revenues – the smallest percentage of all three states. The rate of $64 per child for state child welfare expenditures in 2008 is more than two thirds lower than the rate in Tennessee and less than half the rate in Arizona. In summary, there are sizeable differences in resource allocation between the three states: Depending on the indicator, Tennessee allocated between 1.5 to 3 times more resources to child welfare than Texas. The resource allocation to child welfare of Arizona fell in between these two states, albeit somewhat closer to higher spending Tennessee. Both Tennessee and Arizona had to face a decrease in revenues between 2007 and 2009 while Texas saw an increase of revenues. Overall, expenditures were affected in the same direction although not to the same degree.
Aims

This study examines county-level factors in three states associated with child welfare referrals to family services while controlling for variations in case characteristics. We add to the existing literature by analyzing trends in referrals to family services in three state administered states over a three year period marked by a major economic recession. Case characteristics are introduced to control for variance to differences in the population served. Furthermore, we take the county level into consideration to differentiate the impact of factors operating at the state level from the impact of covariates at the county level. Three research questions guide our analysis: 1) What were the trends in family service rates over the period of GR (2007 to 2009) in Texas, Tennessee and Arizona? 2) What case-level factors were associated with referral to family services over the period of GR (2007 to 2009) in Texas, Tennessee and Arizona? 3) After controlling for case-level factors, what county level factors are associated with referral to family services over the period of GR (2007 to 2009) in Texas, Tennessee and Arizona?

Methods

Data

In 1988, the Child Abuse and Prevention Treatment Act (CAPTA) directed the U.S. Department of Health and Human Services to establish a national data collection and analysis program (U.S. Department of Health & Human Services, 2010b). This lead to the National Child Abuse and Neglect Data System (NCANDS) which annually collects state administrative child maltreatment data. Each state voluntarily maps data from its own child maltreatment information system to a standard NCANDS layout using supplied guidelines.
Child welfare referrals to family services

and with technical assistance from the project staff (cf. Fallon et al., 2010). All screened-in referrals (reports) of abuse and neglect that receive a disposition or alternative response in the given year are included in the case-level data collection component (U.S. Department of Health & Human Services, 2010b). The case-level data is structured into a unit of analysis that contains a unique identifier for each child and report, referred to as a report-child pair (duplicate count). Information collected in the NCANDS includes demographics of the children, maltreatment types, disposition or assessment, services provided, and risk factors of the child and caregiver. The referral to family services was the dependent variable. Report year, geographic location (urban or rural) and states were analyzed as independent variables. Case characteristics were introduced as controls. The variables were operationalized as follows:

**Family services.** Overall, NCANDS layout lists 21 types of specialized services (e.g., U.S. Department of Health & Human Services, 2010b) apart from foster care, adoption and court action. Three of these services were collapsed into family services. Cases with any option of family support, family preservation and home-based services checked were compared to cases where none of these family services were checked. To analyze change in service provision over years, family services were aggregated per county and a rate of family service per 100 reports was calculated.

**Report year.** Report year included 2007, 2008, and 2009. The year corresponds with the U.S. federal fiscal year (October 1 through September 30). Reports received, but where dispositions did not occur during the specified year, were not included in the NCANDS data submission. Reports received in a prior year, but whose disposition was made within
child welfare referrals to family services

the reporting year, were included in the NCANDS data submission (U.S. Department of Health & Human Services, 2009, 2010a, 2010b).

Geographical variables. The county of report was introduced as a second-level identifier in multi-level analyses. To guarantee anonymity of cases in counties that had fewer than 1,000 records were not identified and records were treated as belonging to the same non-identified county in the publicly available data set. Records from these counties had to be dropped for the analyses as information on contextual variables was missing. As Tennessee and Texas have many small counties, between 279 and 287 counties out of a total of 364 counties had to be dropped for the different analyses. Each county was coded as metropolitan or nonmetropolitan area according to the rural-urban continuum codes of U.S. Department of Agriculture (Economic Research Service, 2004). Finally, each county was coded by its corresponding state.

Child demographics. The age of the child was analyzed as a continuous variable including children up to 17 years. For minority status, the analysis used Native American, Asian, Black or African American, Hawaiian or Pacific Islander, Hispanic or Latino. If the child was non-Hispanic White, no minority status was noted. In some cases, race or ethnicity was undetermined. As minority and non-minority status might not be evenly distributed within children with race/ethnicity undetermined, the undetermined cases were analyzed together with minority status.

Child risks. The analyses consider if a child risk had been noted in one of the following categories: Substance abuse (alcohol and drug abuse combined), behavior problem, medical condition (visual/hearing impaired and other medical condition combined). The categories of mental retardation, emotionally disturbed, physical disability
had been noted in less than 0.3% of the sample; therefore, they have been dropped from the analyses. Learning disability had been quite unequally distributed between states. This might have been due to varying definitions and data collection. Therefore, the category has been dropped, too.

**Caregiver risks.** The caregiver’s medical condition (visual/hearing impaired and other medical condition combined) has been introduced in the analyses in dichotomized form (noted/not noted). Further categories (alcohol and drug abuse, mental retardation, emotionally disturbed, learning disability, physical disability, domestic violence, inadequate housing, financial problem and public assistance) had to be dropped as data were missing for one or two of the sampled states.

**Report characteristics.** The NCANDS defines five types of maltreatment (U.S. Department of Health & Human Services, 2010b): Physical abuse, neglect or deprivation of necessities, medical neglect, sexual abuse and psychological/emotional maltreatment. A maximum of four different maltreatment types could be assigned per case with no rank order (U.S. Department of Health & Human Services, 2010b). The case was coded a maltreatment victim if any type of abuse or neglect turned out substantiated or indicated (cf. Trocmé, Knoke, Fallon, & Maclaurin, 2009), or for victims with an alternate response (U.S. Department of Health & Human Services, 2010b). Finally, the report was coded to be associated with a prior victim if incidents of maltreatment for the reported child had previously been substantiated or indicated.

**Contextual variables.** The data on contextual variables at a county level originate from the Area Resource File (Health Resources and Services Administration, 2012) that provides data on measures of resource scarcity, health facilities, health status, economic
activity, demographic, socioeconomic and environmental characteristics from various sources. Included in the analyses are the rate of Hispanic/Latino population and the rate of persons in poverty as both indicators of ethnicity and poverty have been found to impact child welfare decision making (Fluke et al., 2010; Rivaux et al., 2008). The two variables were dichotomized into counties above the mean state rate and counties below the mean state rate. The rate of Hispanic/Latino population is calculated as number of persons of Hispanic/Latino ethnicity (of any race) per 1,000 persons of the total population. Similarly, the rate of persons in poverty refers to the number of persons in poverty per 1,000 persons of the total population. Estimates of persons in poverty data are from the Bureau of Census’ Small Area Income Poverty Estimates (SAIPE) files for the representative years. The SAIPE are constructed from statistical models based, in part, on summary data from 2007-2009 federal income tax returns (respectively), data about participation in the Food Stamp program, and the previous census. Finally, counties were dummy-coded for state. As the largest part of the sample, Texas has been set as reference state.

Sample

Arizona (AZ), Tennessee (TN), and Texas (TX) are the US states that were chosen to address the aims of the study. Child protection in the three states is state-administered. This circumstance allows us to consider policy differences on a state level rather than local structural differences in policy on a county level by excluding states with county administered systems. Second, the states vary on their implementation of differential response policy. Third, the states differ regarding their child welfare budgets as states with high child welfare expenditures are assumed to react differently to a recession compared to low expenditures states. The supply of data to NCANDS varied remarkably between states
and sometimes within states between counties. Arizona, Tennessee and Texas were also included because these states were among the few to supply both data on family services and child risks for all counties. Furthermore, they surpass a child population of 1,000,000 inhabitants (U.S. Department of Health & Human Services, 2009, 2010a, 2010b).

The analysis covers the years of 2007, 2008 and 2009, a period marked by slow or negative economic growth and decreased tax revenues. The data set was reduced to children between birth and 18 years; maltreatment fatalities were excluded. Child-level data were constructed to represent a single report per child and report date (unique referral report-child pairs). Thus, duplicative reports occurring on the same day were deleted. If maltreatment type, disposition or service provision differed for reports on the same child and date, all events were retained. Frequencies of unique referral report-child pairs are presented in Table 2.

**Statistical analysis**

Analysis was divided in two parts. First, trends of family services rates per county were analyzed descriptively (Kovacevic, 1998). Second, within each year multi-level logistic regression models were run to analyze the probability of referrals to family services in relation to case and contextual characteristics. The first level analyzes the impact of case characteristics on referrals to services with the report-child pair as unit of analysis. On a second, nested level we analyze the impact of contextual characteristics on referrals to services with the county of residence as unit of analysis. States were not introduced on a third level as the number of states was too small (Maas & Hox, 2005). The models were fitted via generalized linear mixed-effects logistic regression using Stata 11 (StataCorp,
2007). Goodness of fit was compared by setting a constant-only model (null model) as benchmark, then analyzing covariates on the first level only and finally adding characteristics of the county (full model). As a global measure of model fit, we report information criteria that indicate a better fit if the statistic decreases compared to the null model (Hamaker, van Hattum, Kuiper, & Hoijtink, 2011). To indicate how good the model discriminates between subjects referred to family services and non-referred subjects we display the C-statistic (cf. Hosmer & Lemeshow, 2000). It reports the area under curve in a ROC curve analysis with 1 indicating a perfect model fit. A further measure reported is the median odds ratio (MOR). It translates the county level variance in the widely used and intuitively interpretable odds ratio scale (Merlo et al., 2006) and shows the extent to which the individual probability of getting support services is determined by the child’s county of residence.

As the child’s age was missing for between 2,704 cases (in 2007) and 997 cases (in 2009), these had to be excluded listwise for multi-level analyses; data on child’s age were missing for a maximum of 1.7% of cases per state. The missing age is likely non-random as children with missing age receive fewer services than cases with non-missing age (percentages of services for missing child age were between 4% and 12% while percentages of services for non-missings were between 15% and 16%). Furthermore, cases in missing county identifiers had to be excluded listwise for multi-level analyses as no data on contextual variables was available. The numbers of included cases, identified counties and the totals of listwise exclusions are presented in Table 3. With less than 1% cases excluded due to missings in age, results should still be generalizable in this regard. However, generalizability may be restricted for small rural counties.
Results

Descriptive analyses of referrals to services by state

The GR might have been responsible for an increased demand in child welfare services as well as a decreased supply due to budget cuts. Therefore, no uniform trend had been predicted. Data reveal that rates of family services and their trends differ notably between states (see Figure 1): Over time there was a marked change in the service rates differential across the three states, with the differential dropping from a ten-fold difference in services offered per capita to a three-fold difference. Rates in the high rate state of Arizona declined by around thirty percent between 2007 and 2009 while rates in the two low rate states increased, with rates almost doubling in Tennessee, the lowest service rate state. In Arizona, the rate of family services per 100 reports decreased while the service rate almost doubled for the same period in Tennessee.

The trends for rate of referrals to family services per 100 reports are not always in correspondence with the trends for caseload (see Table 2). While the trends for service referrals continually decrease in Arizona between 2007 and 2009, the caseload per 1,000 children in the population drops in 2008 but again increases in 2009. For Tennessee, the trends for caseload per 1,000 children in the population and the rate of service referrals moved in opposite directions: The former decreased and the latter increased. For Texas, the caseload per 1,000 children in the population more or less stagnated while the rate of service referrals increased.

Multilevel Models predicting referral to services

The probability of referral to family services based on case characteristics and contextual variables was analyzed in multilevel logistic regressions. Table 3 displays the
odds ratios and estimates corrected for standard errors for the full models by year. A majority of odds ratios of first level covariates in the full model and the model with first level covariates only were equal or differed at maximum at the second decimal. We therefore refrained from displaying a table for models with first level covariates only. As predicted, all case characteristics were significantly associated with the probability of referral to family service. However, the strength of association with the outcome differed for the covariates: Older age was associated with a decrease of less than 4%; minority status increased the probability of service referral by less than 15%. For maltreatment victims, on the other hand, a family service referral was between around 7 and 9 times more likely than for non-maltreated children. Besides the latter variable, the strength of association for child risks also differed between the models: The strength of association for child substance abuse was 39% lower in 2009 compared to 2007; contrarily the strength of association was 23% and 24% higher for child behavior problems and child medical condition respectively. For the other covariates, the difference in strength of association was at a maximum of 0.1 for odds ratios.

As hypothesized, model fit increased from the null to level 1 models (see Table 4). Most information criteria for the full model indicate that the inclusion of covariates on the county level increased fit only marginally; and some even decreased fit. Also the C-statistics of full models show a decrease in model fit: discrimination is at a random level. According to the MOR, a large part of the variance in probability of referral to family services was due to differences on the contextual level. The odds of referral to family services were around double or more depending on the county of residence in the acceptably fitted level 1 models. Based on the lack of improved model fit, contextual
variables in the full models should be interpreted very carefully (cf. Table 3): Coefficients for rate of Hispanic/Latino population indicate a positive relationship with referrals to services for 2007 and 2009 that was lacking for 2008. Contrarily, the rate of persons in poverty is positively associated with service referral in 2008, but failed to reach significance in the other years of the analysis. No significant associations had been found for metropolitan location. Coefficients related to the state of residence suggest variation on the state level with an increased likelihood of referral in Arizona and Tennessee compared to Texas, although the strength of association differed and did not reach significance for Tennessee compared to Texas in 2009.

Discussion

Changes in family service referral rates for the years 2007 to 2009 across the three states included in this analysis were pronounced, appearing to converge with rates decreasing by 30% in the state with the highest referral rate, while nearly doubling in the state with the lowest referral rate. These changes are examined relative to two counter-acting influences of the GR: increased demand for services for families facing economic hardship and decreased availability of services in response to budget deficits, moderated by the state’s ability to adapt to increased demand on the basis of pre-recession expenditures.

Marked differences in referrals to services were observed both on the county and state level. On average, the odds of a child receiving a family service in counties with higher service rates were nearly double the odds compared to counties with lower service rates. Compared to Texas, the largest state in the study, the 2007 rate of family service per 100 reports was almost three times higher in Arizona and three times lower in Tennessee. While
Texas shows a slight increase in rate of family services, Arizona sees a significant decline between 2008 and 2009 and Tennessee a considerable increase – albeit on quite different levels. Especially regarding NCANDS data, Eckenrode and Dineen (Eckenrode & Dineen, 2009) point out that dramatic changes in indicators are almost always due to some policy/administrative change and that secular trends in likely causes of maltreatment (such as changes in poverty rates, unemployment, etc.) or the impact of prevention/intervention efforts tend to be reflected in the statistics as smaller changes over longer periods of time. Funding changes between 2007 and 2009 might explain a decline in family services. In Arizona, the decline in family services corresponds to a decline in tax revenues and child welfare expenditures; the decline of caseload, however, was only temporary in 2008. As a high expenditure state, Arizona might have been able to cut down social services budget and still meet the most urgent demands. The temporary decline of reports in 2008 contradicts the assumption of increased demand during the GR and remains unexplained. In Texas, a hypothesized increasing demand for family services corresponds with an actual increase in family services while caseload stagnated. However, Texas did not face a shortcoming in tax revenues during the period. This makes it difficult to disentangle whether the increase in family services is due to an increased demand or an increase in resources, or some other explanation.

The increase in family service provision in Tennessee during the analysis time – amplified by a decrease in caseload – corresponded with the implementation of a differential response track while both Arizona and Texas were testing a differential response approach in pilot programs (National Conference of State Legislatures, 2012; U.S. Department of Health & Human Services, 2009, 2010a, 2010b; Williams-Mbengue,
Ramirez-Fry, & Crane, 2010). One study in states with both, investigation and differential response tracks found that in-home services were more likely to be provided to families in the differential response track (Shusterman, Hollinshead, Fluke, & Yuan, 2005). Similarly, a random assignment study of differential response in Minnesota (Loman & Siegel, 2005) found that more services were provided to families who were assigned to the differential response track compared to otherwise qualified families who received traditional investigations. For Tennessee, additional analyses revealed that the number of reports handled in an alternative response track increased from around 15% in 2007 to 55% in 2009. Children in an alternative response track made up around 50% of family services in both 2008 and 2009. It should also be kept in mind that the full effect of the new policy might not yet show up as lags are fairly likely (Malcolm, 2012; Millett et al., 2011).

Nevertheless, family service rates in Tennessee were the lowest over the study period. This was surprising because Tennessee reported the highest child welfare expenditures in the sample. As suggested by a rate of reports to child welfare around 1.5 times elevated in Tennessee compared to the other sample states (cf. Table 2), part of the resources might be directed to investigative services. It is also possible that resource allocation was directed at administration. For example, data management systems, training, etc., would be considered administrative costs that may not necessarily translate into service rates. When systems become more efficient it is possible that the actual rates of services could decline. While a higher rate of preventive services or foster cares services in Tennessee compared to Texas could explain part of the difference for these two states, the rate of these services is similar or higher in Arizona compared to Tennessee (US Department of Health & Human Services, 2010a). Finally, the difference between expenditures and family service delivery might also
Child welfare referrals to family services

be due to more expensive services, e.g., more expensive private foster care. However, some more expensive services might actually be less costly in the long term if they prove to be effective in preventing multiple reports. More work is needed to distinguish the mechanisms at play when states spend more on child welfare but see reduced rates of service provision.

The impact of child demographics did not differ between the years in the analysis. Although the associations between child demographics and family services were significant, odds ratios were small with an increase of around 10% for minority status and a decrease of less than 5% for increasing age of the child. As suggested by Palusci (Palusci, 2011) endangerment of well-being in infants seems more likely to engender more effective service provision because young children are perceived to be at greatest peril because of their vulnerability. Not surprisingly, any type of noted child or caregiver risk increased the probability of family services. There was a change in strength of association for all types of child risks. For child substance abuse the difference might be related to a substantial increase of child substance abuse in Tennessee. As discussed above the difference is more likely due to a change in administration (e.g., data collection) than in a secular trend (cf. Eckenrode & Dineen, 2009).

With a majority of cases served within an investigation track it is no surprise either that the probability of getting services is heavily dependent on substantiation. The association between substantiation and service provision grew in strength from 2007 to 2008, so having a substantiated finding became more important to receiving services. It might reflect a tendency of child protection workers becoming more restrictive with service provision to cases with inconclusive evidence on child maltreatment. This would make sense for Texas
and Tennessee, where rate of family services per 100 reports increased while report rate per 1,000 children stagnated or decreased. In Arizona, however, service rate decreased and report rate decreased temporarily. Here, the increased strength of association between substantiation and service provision might be due to a decrease in the proportion of substantiated reports which went down by around 6% between 2007 and 2009. Although prior substantiated reports were found to increase the likelihood of placement (Horwitz, Hurlburt, Cohen, Zhang, & Landsverk, 2011; Zuravin & DePanfilis, 1997), this variable was not associated with service provision.

As suggested by the Median Odds Ratio, the difference in probability of referral to family services was substantial between counties. However, the poor model fit for models with second-level covariates suggest a restricted explanatory power of exogenous county-level covariates possibly due to a lack of specificity of these variables at the county level. For example, the dichotomous metro-rural categorization may not capture the difference between completely rural areas and rural areas adjacent to metro areas. However, additional analyses with variations of urban-rural coding did not suggest a different finding for the impact of the urban-rural difference and model fit. Further analyses with median household income and unemployment rate also failed to produce identifiable models.

The NCANDS provides researchers with a continuous census collection on screened-in child welfare investigations that allows exploring for trends (cf. Fallon et al., 2010). However, apart from issues addressed in the methods section, some further limitations have to be considered. First, representativeness of these findings for the whole of the US cannot be inferred, but they do help point out the diverse approaches taken by States to provide services for vulnerable families. Interpretation of trends is limited as information on state
Child welfare referrals to family services

child welfare expenditures is lacking for 2007 and 2008. Second, the types of services collected varied largely between the states, so that certain types of family services might have been missing in the applied dependent variable. Additionally, it is difficult to disentangle variance due to measurement error from variance due to temporal or regional instability. Another issue related to this point is variance possibly explained by nesting siblings into families. The NCANDS allows only for very limited identification of siblings in the same report – in the case they are connected by the same parent-perpetrator. As this identification of families is possibly biased we refrained from introducing a family level in the analysis. Finally, as the administrative data from NCANDS contains a very limited number of variables; other variables possibly associated with service provision – as indicated by the unexplained variance – could not have been analyzed.

**Conclusion**

From the present analysis it seems evident that children and families do not have equal chances to receive family services depending on their geographical location. While state legislation, policy and funding might explain part of this difference, there is need for research on the possible impact of the social structural context, e.g., by including more detailed census data into the analysis (cf. Wulczyn et al., 2011). Although a possible impact of the Great Recession on family services rates remains speculative, it is plausible that it affected states differently depending on their preexisting level of social services expenditures. However, cuts in funding for child welfare services (i.e., state agencies in this analysis) are likely to have an impact on service provision as the dramatic decline of family services in one state indicates. When this occurs, the aims of protecting children and
families adequately may be seriously compromised which suggests a need for more prudence among policy makers when cutting budgets or implementing hiring freezes. Besides the impact on the policy level, the provision of services is still largely, and as expected, driven by case characteristics. With research on child welfare service provision still scarce, future studies will not only have to replicate the associations on the context level but also for case characteristics and explore the possible impact of further variables not yet included.

**References**


Child welfare referrals to family services


Child welfare referrals to family services


Child welfare referrals to family services


Child welfare referrals to family services

Figure 1. Rate of family services per 100 reports by state and year.
Table 1

Tax revenues and child welfare expenditures by state and year

<table>
<thead>
<tr>
<th>State</th>
<th>Child population</th>
<th>State tax revenues</th>
<th>Child welfare expenditures from state funds</th>
<th>Rate per child</th>
<th>As % of state tax revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total (1,000$)</td>
<td>total (1,000$)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arizona</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2007</td>
<td>1,669,866</td>
<td>14,404,976</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Year 2008</td>
<td>1,707,221</td>
<td>13,153,271</td>
<td>264,287</td>
<td>154</td>
<td>2.01</td>
</tr>
<tr>
<td>Year 2009</td>
<td>1,732,019</td>
<td>11,134,404</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Year 2010</td>
<td>1,629,014</td>
<td>10,199,338</td>
<td>233,191</td>
<td>143</td>
<td>2.29</td>
</tr>
<tr>
<td>Tennessee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2007</td>
<td>1,471,486</td>
<td>11,390,037</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Year 2008</td>
<td>1,478,594</td>
<td>11,538,430</td>
<td>292,708</td>
<td>197</td>
<td>2.54</td>
</tr>
<tr>
<td>Year 2009</td>
<td>1,493,252</td>
<td>10,433,133</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Year 2010</td>
<td>1,496,001</td>
<td>10,513,788</td>
<td>271,763</td>
<td>182</td>
<td>2.59</td>
</tr>
<tr>
<td>Texas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2007</td>
<td>6,623,366</td>
<td>40,314,714</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Year 2008</td>
<td>6,725,771</td>
<td>45,536,833</td>
<td>434,273</td>
<td>64</td>
<td>0.95</td>
</tr>
<tr>
<td>Year 2009</td>
<td>6,895,969</td>
<td>41,779,699</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Year 2010</td>
<td>6,865,824</td>
<td>39,399,251</td>
<td>541,065</td>
<td>79</td>
<td>1.37</td>
</tr>
</tbody>
</table>

Note: Reports 1 see sample section for reference of years 2007-2009, reference for 2010 data (Howden & Meyer, 2011); 2 2010 state tax revenues (U.S. Census Bureau, 2011), all other data on state tax revenues and child welfare expenditures are referenced in the text; 3 all rates of state child welfare expenditures per child have been calculated by the authors using the referenced data and total state child population; 4 total state child welfare expenditures as a percentage of state tax revenues have been calculated by the authors.
Child welfare referrals to family services

Table 2

Frequencies of child welfare investigation, family services and child risks by state and year

<table>
<thead>
<tr>
<th></th>
<th>Child population¹</th>
<th>Unique referral report-child pairs²/ rate per 1,000 children of state’s child population</th>
<th>Any family service rate per 1,000 children of state’s child population</th>
<th>Child risks (frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>frequency</td>
<td>frequency</td>
<td>rate per 100 reports</td>
</tr>
<tr>
<td>Arizona</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2007</td>
<td>1,669,866</td>
<td>74,342</td>
<td>28,232</td>
<td>16.9</td>
</tr>
<tr>
<td>Year 2008</td>
<td>1,707,221</td>
<td>65,606</td>
<td>25,292</td>
<td>14.8</td>
</tr>
<tr>
<td>Year 2009</td>
<td>1,732,019</td>
<td>73,176</td>
<td>22,224</td>
<td>12.8</td>
</tr>
<tr>
<td>Tennessee</td>
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<td></td>
<td></td>
<td></td>
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<td>Year 2007</td>
<td>1,471,486</td>
<td>99,213</td>
<td>3,482</td>
<td>2.4</td>
</tr>
<tr>
<td>Year 2008</td>
<td>1,478,594</td>
<td>97,990</td>
<td>3,596</td>
<td>2.4</td>
</tr>
<tr>
<td>Year 2009</td>
<td>1,493,252</td>
<td>89,337</td>
<td>7,068</td>
<td>4.7</td>
</tr>
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<td>Texas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2007</td>
<td>6,623,366</td>
<td>280,432</td>
<td>35,530</td>
<td>5.4</td>
</tr>
<tr>
<td>Year 2008</td>
<td>6,725,771</td>
<td>285,261</td>
<td>40,587</td>
<td>6.0</td>
</tr>
<tr>
<td>Year 2009</td>
<td>6,895,969</td>
<td>289,197</td>
<td>45,053</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Note: Reports concerning children between 0 and 18 years; fatalities excluded; ¹ see sample section for reference; ² Unique referral report-child pairs are an indicator of caseload.
### Table 3

**Multilevel logistic regressions for referrals to family services separated by years 2007 to 2009**

<table>
<thead>
<tr>
<th></th>
<th>Full level model 2007&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Full level model 2008&lt;sup&gt;4&lt;/sup&gt;</th>
<th>Full level model 2009&lt;sup&gt;5&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Level 1: n = 368,913; Level 2: n = 85)</td>
<td>(Level 1: n = 356,952; Level 2: n = 78)</td>
<td>(Level 1: n = 363,099; Level 2: n = 77)</td>
</tr>
<tr>
<td></td>
<td>Est./SE OR CI (95%)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Est./SE OR CI (95%)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Est./SE OR CI (95%)&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Level 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Case characteristics / fixed effects)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child age</td>
<td>-40.89*** 0.96 0.96-0.96</td>
<td>-41.75*** 0.96 0.95-0.96</td>
<td>-43.24*** 0.96 0.95-0.96</td>
</tr>
<tr>
<td>Minority status</td>
<td>7.68*** 1.09 1.07-1.12</td>
<td>8.29*** 1.10 1.08-1.13</td>
<td>10.86*** 1.13 1.11-1.16</td>
</tr>
<tr>
<td>Child substance abuse noted</td>
<td>13.80*** 1.49 1.40-1.57</td>
<td>8.87*** 1.30 1.23-1.38</td>
<td>3.38** 1.10 1.04-1.16</td>
</tr>
<tr>
<td>Child behavior problem noted</td>
<td>8.61*** 1.38 1.28-1.48</td>
<td>8.93*** 1.40 1.30-1.51</td>
<td>13.52*** 1.62 1.51-1.74</td>
</tr>
<tr>
<td>Child medical condition noted</td>
<td>18.92*** 1.74 1.65-1.85</td>
<td>20.60*** 1.80 1.70-1.90</td>
<td>24.84*** 1.97 1.85-2.06</td>
</tr>
<tr>
<td>Caregiver medical condition noted</td>
<td>10.31*** 1.43 1.34-1.53</td>
<td>10.76*** 1.43 1.34-1.53</td>
<td>12.32*** 1.49 1.40-1.59</td>
</tr>
<tr>
<td>Prior substantiated or indicated report</td>
<td>8.49*** 1.14 1.10-1.17</td>
<td>5.30*** 1.08 1.05-1.11</td>
<td>11.80*** 1.18 1.15-1.21</td>
</tr>
<tr>
<td>Maltreatment victim</td>
<td>156.23*** 7.24 7.06-7.42</td>
<td>175.08*** 8.77 8.56-9.00</td>
<td>190.26*** 8.88 8.68-9.08</td>
</tr>
<tr>
<td><strong>Level 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(County characteristics / random effects&lt;sup&gt;1&lt;/sup&gt;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate of Hispanic/Latino population</td>
<td>2.10* 1.67 0.20-1.31</td>
<td>0.00 1.00 0.00-0.00</td>
<td>2.99** 1.67 0.26-0.98</td>
</tr>
<tr>
<td>Rate of persons in poverty</td>
<td>0.00 1.00 0.00-0.00</td>
<td>2.66** 1.52 0.20-0.87</td>
<td>0.00 1.00 0.00-0.00</td>
</tr>
<tr>
<td>Metropolitan county</td>
<td>0.00 1.00 0.00-0.00</td>
<td>0.00 1.00 0.00-0.00</td>
<td>0.37 1.18 0.00-0.00</td>
</tr>
<tr>
<td>AZ county&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3.94*** 9.39 1.36-3.68</td>
<td>3.94*** 7.02 1.18-3.20</td>
<td>3.71*** 4.25 0.85-2.45</td>
</tr>
<tr>
<td>TN county&lt;sup&gt;2&lt;/sup&gt;</td>
<td>5.79*** 3.82 0.95-1.88</td>
<td>5.67*** 6.83 1.36-2.72</td>
<td>0.21 1.14 0.00-1.556.1</td>
</tr>
<tr>
<td>Constant/Intercept</td>
<td>8.62*** 1.60 0.38-0.59</td>
<td>7.70*** 1.47 0.30-0.50</td>
<td>2.02* 1.47 0.15-1.02</td>
</tr>
</tbody>
</table>

**Note:** Coefficients for random-effects are standard deviations;<sup>2</sup> In comparison to TX counties (largest part of the sample);<sup>3</sup> 85,074 cases excluded listwise;<sup>4</sup> 91,905 cases excluded listwise;<sup>5</sup> 88,611 cases excluded listwise;<sup>6</sup> CI for second level covariates are CI of estimates (CI of OR are not provided by Stata);<sup>6</sup>*p < 0.05;<sup>6</sup>**p < 0.01;<sup>6</sup>***p < 0.001

---

3 1 Table 3

2 Multilevel logistic regressions for referrals to family services separated by years 2007 to 2009

1 Child welfare referrals to family services

3 Note: Coefficients for random-effects are standard deviations; In comparison to TX counties (largest part of the sample); 85,074 cases excluded listwise; 91,905 cases excluded listwise; 88,611 cases excluded listwise; CI for second level covariates are CI of estimates (CI of OR are not provided by Stata); *p < 0.05; **p < 0.01; ***p < 0.001
Table 4

Multilevel logistic regressions for referrals to family services - model parameters

<table>
<thead>
<tr>
<th>Year</th>
<th>Model Type</th>
<th>Wald $\chi^2$</th>
<th>Goodness of Fit Statistics</th>
<th>Median Odds Ratio (MOR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>AIC</td>
<td>Sample-size Adjusted BIC</td>
</tr>
<tr>
<td>2007</td>
<td>Null model</td>
<td>n.a.</td>
<td>279,263.1</td>
<td>279,284.7</td>
</tr>
<tr>
<td></td>
<td>Level 1 model</td>
<td>28,146.81***</td>
<td>248,712.2</td>
<td>248,820.4</td>
</tr>
<tr>
<td></td>
<td>Full level 2 model</td>
<td>28,152.77***</td>
<td>248,664.5</td>
<td>248,826.8</td>
</tr>
<tr>
<td>2008</td>
<td>Null model</td>
<td>n.a.</td>
<td>283,721.6</td>
<td>283,743.1</td>
</tr>
<tr>
<td></td>
<td>Level 1 model</td>
<td>34,080.97***</td>
<td>246,200.4</td>
<td>246,308.3</td>
</tr>
<tr>
<td></td>
<td>Full level 2 model</td>
<td>34,087.22***</td>
<td>246,137.9</td>
<td>246,299.7</td>
</tr>
<tr>
<td>2009</td>
<td>Null model</td>
<td>n.a.</td>
<td>318,510.2</td>
<td>318,531.8</td>
</tr>
<tr>
<td></td>
<td>Level 1 model</td>
<td>40,050.88***</td>
<td>275,010.7</td>
<td>275,118.8</td>
</tr>
<tr>
<td></td>
<td>Full level 2 model</td>
<td>40,084.16***</td>
<td>274,987.7</td>
<td>275,149.7</td>
</tr>
</tbody>
</table>

Note: *** p < 0.001
Acknowledgements

The analyses presented in this publication were based on data from the National Child Abuse and Neglect Data System (NCANDS) Child Files, FFY 2007, FFY 2008 and FFY 2009. These data were provided by the National Data Archive on Child Abuse and Neglect at Cornell University, and have been used with permission. The data were originally collected under the auspices of the Children’s Bureau. Funding was provided by the Children’s Bureau, Administration on Children, Youth and Families, Administration for Children and Families, U.S. Department of Health and Human Services. The collector of the original data, the funding agency, NDACAN, Cornell University, and the agents or employees of these institutions bear no responsibility for the analyses or interpretations presented here. The information and opinions expressed reflect solely the opinions of the authors.