

## **Application of the Evaluation Framework for Program Improvement of START**

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*This study applies the Children's Bureau program evaluation framework (Framework Workgroup, 2014) to the Sobriety Treatment and Recovery Team (START) program, an integrated program between child welfare and substance abuse treatment. A cluster analysis of 673 START participants in 420 families identified three subgroups. Intact families retained child custody throughout treatment and achieved the highest rates of sobriety. Despite similar substance use disorders and loss of parental custody, group two was mostly reunified and group three was rarely reunified. Group differences in trends suggest a need for additional and innovative strategies to support program improvement.*

*KEYWORDS leadership, administration and supervision, substance abuse, evidence-based practices*

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## INTRODUCTION

Results of the National Survey on Drug Use and Health (NSDUH), with a representative sample of 87,656 adults, estimated that 7.3 million children (10.3% of the U. S. child population) and 13.9% of the population age 3 years or younger live with one or more parents who have a substance use disorder (SUDS) (Substance Abuse and Mental Health Services [SAMHSA], 2009). An estimated 4.4% of pregnant women were current illicit drug users (SAMHSA, 2011). Parental SUDS, however, does not constitute child abuse and neglect (CAN); estimating the prevalence of CAN among all children living with parental SUDS is hampered by data collection and assessment challenges (Chuang, Wells, Belletiere, & Cross, 2013; Young, Boles, & Otero, 2007). Among 95 families referred to child protection services (CPS) with identified parental SUDS, 52.0% were substantiated; families rated as more impoverished with children rated as more vulnerable tended to receive a substantiated finding (Scannapieco & Connell-Carrick, 2007). Data from the U.S. Department of Health and Human Services (US DHHS, 2012) showed that 20.0% of child victims of CAN had a risk factor due to parental drug abuse, but rates varied between 3.0% and 62.6% for the 34 states reporting. In 2008, the rate of placement of infants (age < 1 year) in foster care was 8.9/1000 in the population versus 1.8/1000 for older children; 61.0% of these infants were affected by parental SUDS (Wulczyn, Ernst, & Fisher, 2011).

In newborns, drug withdrawals symptoms vary but include tremors, irritability, and crying that may persist for 18 months (Hudak & Tan, 2012), challenging parenting and maternal attachment (Bergin & McCollough, 2009). Parental SUDS is associated with five times the rate of exposure to traumatic events and related stress responses for children (Sprang, Clark, & Staton-Tindall, 2010). In turn child neglect and stress, often associated with parental SUDS, pose risks for impairments in self-regulation, development, and learning (Perry, 2002; Wilson & Horner, 2005) and propensity toward SUDS as adults (Dodge et al., 2009). Children younger than 3 months at entry spend 33% more time in foster care than infants age 3 to 12 months and 50% more time in than older, compounding risks to child well-being (Wulczyn et al., 2011).

In response to such statistics, multiple authors and government agencies urge changing the service delivery paradigm between SUDS treatment and child welfare toward more integrated interventions aimed to simultaneous improve adult recovery and child wellbeing (Child and Family Services Improvement Act, 2006; Hayward, Depanfilis, & Woodruff, 2010; Laudet & Humphreys, 2013; Oliveros & Kaufman, 2011; Semidei, Radel, & Nolan, 2001; Taylor, 2011; White, 2008). Multi-agency integrated interventions should include shared goals, outcomes, and case coordination; Young, Nakashian, Yeh, and Amatetti (2007) provide guidelines. Integrated programs and strategies are producing improved outcomes (Huebner, Willauer, & Posze, 2012; Lee, Esaki, & Greene, 2009; Ryan, Marsh, Testa, & Louderman, 2006).

## Purpose and Overview

This manuscript is intended to illustrate the Children's Bureau *Framework to Design, Test, Spread, and Sustain Effective Practice in Child Welfare* (Framework Workgroup, 2014) as applied to the Sobriety Treatment and Recovery Team (START) program. To do this, the first four phases of the framework are described in relationship to the START program and the fifth and final phase of the framework is illustrated with a specific study. The framework defines a five-phased process from intervention development and testing through applying and improving interventions in child welfare practice. As a practical guide, the framework is intended for child welfare leadership, funding agencies, and researchers to strengthen the use of evaluation findings in policy and program decision-making.

The START program is a child-welfare led intervention for families with co-occurring CAN and parental SUDS designed as an integrated program with SUDS treatment providers. Each child welfare START team includes a specially trained social service worker paired with a family mentor that carry a caseload of 12 to no more than 15 families. Family mentors are individuals in drug or alcohol recovery with at least three years of sustained sobriety and experiences that sensitize them to issues of CAN. They are full-time employees with primary duties to engage parents in treatment and coach them on relapse prevention and response, sober and safe parenting, and managing life tasks (Huebner, Willauer, Brock, & Coleman, 2010).

## START Illustration of the Children's Bureau Framework

### IDENTIFY AND EXPLORE

The first framework (Framework Workgroup, 2014) phase of *identify and explore* is intended to either select and existing program or initiate an intervention to meet specific needs. START was initiated in 1989 as the Alcohol and Drug Addiction Protection Team program in Toledo and later developed by the Annie E. Casey Foundation (2001) in Cleveland to address the needs of families with infants affected by the crack/cocaine epidemic. Ohio's child welfare agency sought to develop an intervention to reduce placement of substance exposed infants in state custody. Similarly in 2005 and 2006 the state agency, site of the current study, sought an intervention to address parental SUDS because of findings that approximately 90% of children age 3 years and younger in state custody had risks to safety due to parental SUDS (Kentucky Department for Community Based Services, 2006). The state agency adopted START as a promising intervention and allocated state funds to support and evaluate the program.

### DEVELOP AND TEST

In the second framework (Framework Workgroup, 2014) phase of *develop and test* the intervention is defined, developed, stabilized, and initially tested.

Essential strategies of START included the family mentor, strong collaboration, and shared values with treatment providers, and quick access to intensive SUDS treatment services. Team decision-making including extended family members, SUDS providers, and START staff was practiced throughout the case. Initial program evaluation used focus groups, measures of program implementation and administrative data to track child welfare outcomes (Usher & Wildfire, 2003); 81% of mothers in START received substance abuse treatment compared to 45% in typical CPS practice (Young & Gardner, 2002). Two-thirds of women entered a second or third treatment program suggesting that START reengaged mothers who were unsuccessful the first time (Young & Gardner, 2002). Children of 53% of women were placed in out-of-home care (Usher & Wildfire, 2003). The practice of engaging fathers in START services was added as an essential strategy in this state.

#### COMPARE AND LEARN

The *compare and learn* phase of the framework (Framework Workgroup, 2014) is intended to be a summative evaluation that suggests that an intervention is more likely than alternatives to improve outcomes. Measures of fidelity; a START tracking system for families, adults and children; and a SUDS treatment tracking system were developed for program evaluation. Common identification numbers were used to link these program data to child welfare administrative data. Fidelity to essential START intervention strategies was achieved after two full years of operation. With fidelity to quick access, parents progressed on average from the date of the CPS report of CAN to referral to START in 11.1 days; then progressed to the first team meeting in another 5.9 days and the SUDS intake assessment in 3.4 days (Huebner, Posze, Willauer, & Hall, in press). By 39.8 days from the date the CPS report was received, parents completed at least five behavioral health treatment sessions and overall received a total of 88.5 SUDS treatment sessions (Huebner et al., in press).

The START summative evaluation (Huebner et al., 2012) used a matched comparison group of families receiving usual child welfare services. Families with substantiated CAN were matched to START families based on severity of risk as rated on a 28-point scale unique to the state's assessment process, parental SUDS, county, and age of children. The intervention and comparison groups were equivalent at baseline with an average cumulative risk rating for both groups of 19.3 (on a 0–28 scale), falling into the top 10.0% of risk for all CPS reports. Findings included: 42.0% of children in the comparison group and 21.0% of START-served children were placed in state custody; 66.0% of mothers achieved sobriety compared to an expected rate of 38.0%; for every \$1.00 spent on START, the state avoided \$2.22 in out-of-home care costs.

START meets the California Evidence-Based Clearinghouse (2009) criteria of a “promising” program with one published study of effectiveness, a treatment manual and fidelity measures.

#### REPLICATE AND ADAPT

The fourth framework (Framework Workgroup, 2014) phase of *replicate and adapt* is intended to promote widespread, consistent, and appropriate implementation of the intervention. Four START sites were established in two urban, one rural and one Appalachian county. The counties were chosen within four different behavioral health regions to serve as a catalyst for improved interagency collaboration throughout the region. The four counties had a diverse profile of CAN, poverty, and race and SUDS treatment expertise. Because START originated in an urban setting serving only families with drug exposed infants, START strategies were adapted to meet individual community needs and state statutes and policies while retaining the essential intervention strategies.

#### APPLY AND IMPROVE

The present study highlights the last framework phase of *apply and improve* (Framework Workgroup, 2014) designed to improve agency decision-making about the intervention, delivery of the intervention, and child and family outcomes. Evaluation is intended to expand knowledge of ‘how’ the intervention works, what impedes achieving results, who seems to benefit and most importantly shares this information with practitioners and leaders to use in continuous quality improvement (CQI) of the program (Wilson, Lavis, Travers, & Rourke, 2010). This phase aligns with the *innovation* and *sustainability* concepts of implementation science (Fixsen, Naoom, Blasé, Friedman, & Wallace, 2005) where shifting agency conditions may require innovation or program improvement to optimize results.

Despite positive outcomes of START compared to usual child welfare practice, one-third of mothers and half of the fathers served did not achieve sobriety and some children were placed outside of parental custody (Huebner et al., 2010). Thus, families achieved unequal results. For every family accepted to START, two additional families were referred but could not be served due to full caseload. Although 74.0% of START cases were closed within 18 months, it required four years for all cases in every entry-cohort to be closed. Thus some cases remained opened for a longer period, increasing the costs per family-served and filling START slots that might be available for new families. This study was intended to explore variations in family outcomes to spur program innovations that might strengthen the efficiency or effectiveness of START.

## METHOD

The study was conducted in phases. In phase one, data on four START outcomes and four contextual variables were used to identify homogeneous subgroups using cluster analysis techniques. In phase two, characteristics of the cluster subgroups were compared to identify differences that might inform program improvement. START leaders and practitioners participated in the study design, interpretation and subsequent program improvement process.

The study is based on all cases served by START since 2007 and closed any time prior to February 22, 2013. A total of 420 families with 673 parents with SUDS and 866 children were included. Families are eligible for START services when they have substantiated CAN, parental SUDS as a primary safety risk, at least one infant or toddler, no currently open CPS case, and are referred to START within 30 days of the CPS report. Families meeting these criteria were served if a program slot was available; eligible but not-served families received child welfare and treatment services as usual. All procedures for data collection, data sharing and analysis were approved through the state's research board. The specific research questions were:

- What homogeneous subgroups of parents/families can be identified in the START served population?
- Which descriptive, process or outcome variables with potential to support program or case decisions differentiated the subgroups?

### Participants

Of the 420 families, 57.1% were couples in which both the father and the mother had an active SUDS but only 20.0% of all families were married; 67.0% of adults had never married. An additional 37 parents served by START as partners/spouses without active SUDS were not included in this study to avoid inflation of sobriety outcomes. Among parents, 20.1% were African American, 78.6% Caucasian, and 1.3% Hispanic. Parents abused an average of 3.1 substances at intake with 78.2% of mothers and 71.7% of fathers being poly-substance users.

The median age of the 264 fathers was 28.0 years with 55.0% having at least a twelfth-grade education. Fathers were biological parents (79.2%) to at least one child in the family with one adopted father, 4.2% an assumed father, and 16.0% significant others; 57.6% were employed fulltime or part-time at START referral. The median age of the 409 mothers was 25.8 years old with 58.2% having at least a twelfth-grade education. All were birth mothers with 25.0% employed full or part-time at referral.

The 866 children served by START included 58 children born during the program. The median age of children at CPS report was 1.5 years; 33.5% ( $n = 271$ ) were newborns age 30 days or younger and a total of 42.8% were

children age 1 year or younger. Of these families 63% included a newborn, and 95.0% of these newborns had documented substance exposure at birth. Children were Caucasian (69.3%) with 27.9% African American, 2.0% Hispanic, and 0.8% 'other'; 53.5% were boys and 46.5% girls.

## Data Sources and Collection

Common identification numbers were used to merge data from the START Information Network (START\_IN) with state CPS administrative data used for federal data submissions. START\_IN includes documentation of services provided, family mentor contacts, substances abused, monthly ratings of progress, drug test results, ratings on the *North Carolina Family Assessment Scale for General Services* (NCFAS-G; Kirk & Martens, 2006), and child permanency status. Administrative data included all CPS reports, substantiated CAN, and placement data for children in state custody. Data from START\_IN were cleaned monthly and data quality was reinforced during quarterly meetings and frequent reports highlighting preliminary results and data issues. This vigilance was labor intensive, but resulted in a 100% match when merging datasets with complete data on all study indicators.

## Measures

### OUTCOME VARIABLES USED IN CLUSTER ANALYSIS

In phase one, cluster analysis was used to identify homogeneous subgroups that achieved four outcomes measures: parental sobriety, child placement outcome, parental capability, and family safety. For each parent, a dichotomous measure of sobriety (achieved or failed to achieve) was based on family mentor ratings of parent progress on three goal domains: participation in treatment and related drug screen results, involvement in community recovery supports and improvement in parental capacity and other CPS goals. Monthly for each parent, the family mentor recorded the number of community recovery support meetings attended, the results of drug tests and participation in treatment as documented by the SUDS treatment coordinator. Based on these data and the progress toward CPS goals, the mentor rated each parent's overall progress on one of six anchors: 1) *throughout this entire month, the adult was unable to be located*; 2) *getting worse*; 3) *no progress on goals*; 4) *making or maintaining progress on one goal*; 5) *making or maintaining progress on two goals*; and 6) *making or maintaining progress on all goals*. For this analysis the last three ratings were defined as *progressing* during the program and as having achieved sobriety at case closure. The first three ratings were defined as *not progressing* and the rating of being *unable to locate* was additionally defined as being *AWOL*. Thus the measure of sobriety included indicators beyond drug test results or completion of a treatment

modality. The results are reported both for all parents and for the primary adult (409 mothers and 11 fathers).

Child placement outcome was based on two data sources. State administrative data were used to identify children placed in state custody and reunified with the biological parent before the START case was closed. Because the state's administrative data are inconsistent for children placed with a relative due to variations in court ordered custody and the state's kinship program, the measure of placement with relatives and reunification with the parents from a relative placement was tracked in START\_IN by the START social worker. If the child remained in the custody of the parent/s throughout START, even if the parent and child lived with a relative, then this child was counted as having remained in parent custody. If the child was placed in the custody of the state or in the custody of a relative for at least 24 hours they were counted as "removed" or placed outside of parental custody. A total of 42 children (in 17 families) were placed in both state and relative custody (sequentially) at some time. For children placed outside parental custody, reunified status at case closure meant that children returned to the custody of at least one parent. Three categorical variables were generated: remained in parent custody, removed and reunified, and removed but not reunified. Children in three families had different outcomes; if any child was removed or not reunified, parents were coded as having that outcome even if another child remained with or was reunified with the parent.

The NCFAS-G (Kirk & Martens, 2006) was used at intake, every 6 months and at closure to assess families in the eight domains of *environment*, *parental capabilities*, *family interactions*, *family safety*, *child well-being*, *social and community life*, *self-sufficiency*, and *family health*. The NCFAS-G is scored on a six-point scale from  $-3$  (*severe weakness*) to  $0$  (*adequate*) to  $+2$  (*strength*). Each domain consists of ratings on several items used to determine the overall Domain Score. The scales of the NCFAS and NCFAS-G have been shown to be reliable and sensitive to change with evidence of predictive and comparative validity (Kirk, Kim, & Griffith, 2005; Kirk & Martens, 2006). In this study, a comparison of intake and case closure scores on the domains of *parental capabilities* and *family safety* were used as an outcome measure. The measure of parental capabilities assesses supervision of children, disciplinary practices, provision of development/enrichment opportunities and parental mental and physical health. The measure of family safety assesses the presence or absence of CAN and domestic violence. Based on intake and case closure scores, three ratings for each domain were generated for each parent: improved, unchanged, or declined scores.

#### CONTEXTUAL VARIABLES USED IN CLUSTER ANALYSIS

Four continuous variables were added to the cluster analysis to measure START resource utilization: the duration of START services in months from referral to

case closure, the total number of hours spent with the family by the family mentor, the total number of drug tests and the total number of positive drug tests. Because the duration of START varied by cluster, post hoc analyses were completed using measures standardized as number per month of START services for: the number of family mentor hours, drug tests and positive drug tests. Substances abused by at least 30.0% of parents as shown in [Table 1](#) were entered as dichotomous variables (abused or not abused) in the cluster analysis. Additional substances such as methamphetamine or hallucinogens were abused by less than 10.0% of parents and excluded.

#### ADDITIONAL VARIABLES USED IN PHASE TWO ANALYSIS

The purpose of the second research question was to compare variables that might differentiate the cluster groups and support program decisions or innovations. Child variables included children born during the program, age at START referral and recurrence of CAN within six months of a previous substantiation. Race and gender were added to describe the clusters.

Family outcomes included the total number of seven subscales rated as adequate to strong on the NCFAS-G (scores of 0, 1 or 2) at intake and case closure. Scores on the NCFAS-G Child Wellbeing subscale were excluded because they tended to remain strong from intake to closure and reflected the child status more than parental capability. Because the family mentor is an essential component of START, the average number of contacts with the family in two domains was added to help understand the mentor's efforts. Each day that the family mentor had any contact with or on-behalf of any member of the family, they entered the contact information into a family mentor checklist (START\_IN). For this study, the average number of contacts per month of START services providing recovery support (e.g., accompany to a community recovery meeting or coaching on recovery skills) or child safety support (e.g., coaching on sober parenting or reinforcing the child safety plan) was compared based on cluster group membership.

Individual parent data on four measures of engagement included the average number of months that the adult was rated as being AWOL, not progressing, the percent of adults with a final rating of AWOL, and the average number of community recover support meetings attended per month of START services. Four measures were used to describe parental SUDS: the average number of substances abused, receiving residential treatment, receiving detoxification, and the percent of drug tests rated as either positive, tampered or no shows.

#### Data Analysis

The first phase of this study used cluster analysis to identify latent homogeneous groups of parents based on the outcome and contextual

**TABLE 1** Profiles of the Subgroups Based on Cluster Analysis Classification

Variable	Cluster 1		Cluster 2		Cluster 3		Totals	Test and <i>p</i> value
	Intact family	Mostly reunified	Intact family	Mostly reunified	Rarely reunified	Rarely reunified		
Parents in cluster, <i>n</i>	257	216	200	673				
Parents in cluster, %	38.2%	32.1%	29.7%					
Families in cluster, <i>n</i>	171	130	119	420				
Families in cluster, %	40.7%	31.0%	28.3%					
	Reported by Family							
Child placement outcome								
Remained in parent custody	100.0%	0.0%	0.0%	40.7%	0.0%			$\chi^2 .000$
Removed and reunified	0.0%	65.4%	7.6%	36.9%	7.6%			$\chi^2 .000$
Removed but not reunified	0.0%	34.6%	92.4%	22.4%	92.4%			$\chi^2 .000$
Months START service <sup>a</sup>	11.7	19.9	16.4	15.6	16.4			<i>F</i> .000
Total hours family mentor contact, <i>n</i>	41.2	74.2	61.4	57.1	61.4			<i>F</i> .000
Average family mentor contact hours/month of START	3.6	3.9	4.0	3.8	4.0			<i>F</i> .060 <sup>NS</sup>
Family assessment (NCFAS-G), %								
Improved in family safety	84.2%	90.8%	11.8%	65.7%	11.8%			$\chi^2 .000$
Unchanged in family safety	9.9%	8.5%	44.5%	19.3%	44.5%			$\chi^2 .000$
Declined in family safety	5.8%	0.8%	43.7%	15.0%	43.7%			$\chi^2 .000$
Improved in parental capability	86.5%	92.3%	7.6%	66.0%	7.6%			$\chi^2 .000$
Unchanged in parental capability	9.9%	5.4%	52.1%	20.5%	52.1%			$\chi^2 .000$
Declined in parental capability	3.5%	2.3%	40.3%	13.6%	40.3%			$\chi^2 .000$
	Report by Individual Parent							
Achieved sobriety—any parent	75.9%	63.9%	9.0%	52.2%	9.0%			$\chi^2 .000$
Achieved sobriety—primary adult	83.6%	73.8%	6.7%	58.8%	6.7%			$\chi^2 .000$

(Continued)

**TABLE 1** Profiles of the Subgroups Based on Cluster Analysis Classification (*Continued*)

Variable	Cluster 1 Intact family	Cluster 2 Mostly reunified	Cluster 3 Rarely reunified	Totals	Test and <i>p</i> value
Substances abused					
Marijuana	73.2%	61.6%	66.5%	67.5%	$\chi^2 .026$
Opiates	46.3%	67.6%	73.0%	61.1%	$\chi^2 .000$
Benzodiazepine	30.0%	37.5%	49.0%	38.0%	$\chi^2 .000$
Alcohol	30.0%	39.8%	43.0%	37.0%	$\chi^2 .010$
Cocaine	22.2%	39.4%	36.5%	31.9%	$\chi^2 .000$
Total drug tests, <i>n</i>	31.8	46.2	34.6	37.2	<i>F</i> .000
Average total drug tests/month of START, <i>n</i> <sup>b</sup>	2.8	2.3	2.2	2.4	<i>F</i> .000
Total positive drug tests, <i>n</i> <sup>a</sup>	3.0	4.2	6.0	4.3	<i>F</i> .000
Average total positive drug tests/month of START, <i>n</i> <sup>c</sup>	0.3	0.2	0.4	0.3	<i>F</i> .000

Note. Post-hoc Scheffe contrasts found significant differences in means: <sup>a</sup>between all three clusters; <sup>b</sup>between cluster 1 and clusters 2 and 3 (NS differences between clusters 2 and 3); and <sup>c</sup>between cluster 3 and clusters 1 and 2 (NS differences between clusters 1 and 2).

variables just described. Cluster analysis is a statistical procedure that, using SPSS in this study, groups similar participants into homogeneous subgroups or clusters. Cluster analysis was completed with both continuous and categorical data from 673 parents, making K-means clustering the appropriate analysis where the number of clusters is specified a priori (Antonenko, Serkan, & Niederhauser, 2012).

In the second phase of this study, subgroup differences were tested for statistical significance using chi-square tests for categorical variables (e.g., sobriety) or one-way analysis of variance (ANOVA) for continuous variables. Statistical significance was set at or below the .05 level. Post-hoc analysis of significant findings with continuous variables was conducted using Scheffe tests. Results are reported by family, parent or child depending on the variable.

## RESULTS

### Cluster Groups

Two, three, and four cluster solutions were explored. The two-cluster solution yielded one large and one small group based on the abuse or non-abuse of cocaine and opiates rather than outcome measures. The four-cluster solutions included variations in group size from 100 to 209 with no discernable pattern of scores. The three-cluster solution aligned with child outcomes and had similar sample sizes in each group, supporting follow-up analysis. The three-cluster solution was chosen as being most interpretable and conceptually meaningful. Table 1 displays cluster membership on all the variables entered into the analysis. Cluster group assignment was saved to the dataset for each family, parent and child. A nuance in this study was interpreting data on families when adult data were used to generate cluster membership because parents in the same family could be assigned to different clusters. Of 238 families with multiple parents, 229 families (96.3%) were grouped in the same cluster; the remaining nine families with differences in parental cluster membership were coded by the child outcome for all parents.

Cluster one with 40.7% of families was labeled *intact families* because 100% of children remained in parent custody throughout START. Most (83.6%) primary parents achieved sobriety by START case closure; 84.2% improved in family safety and 86.5% improved in parental capability. Except for abuse of marijuana, they had the lowest rates of substances abused. Although they had significantly more drug tests per month (2.8/month), they had the lowest rates of positive drug tests. Families in this cluster achieved positive outcomes in the shortest (11.7 months) duration of service delivery.

Cluster two included 31.0% of families and was labeled *mostly reunified* because all children in this cluster were removed from parental custody but

65.4% were reunified with at least one parent by START case closure. Family NCFAS-G ratings improved for 90.8% on family safety and improved for 92.3% on parental capability, with 73.8% of primary adults and 63.9% of parents achieving sobriety despite the fact that 67.6% of parents abused opiates. The cases were opened the longest at 19.9 months.

The third cluster included 28% of families and was labeled *rarely reunified* because all children in this cluster were removed from parental custody but only 7.6% were reunified with a parent. Parents had the highest rates of drugs abused with 73.0% abusing opiates, but 9.0% achieved sobriety by case closure. In contrast to families in clusters one and two, 88.2% and 92.4% of families failed to improve or declined in family safety and parental capability respectively. The START case was opened 4.5 months longer than cases in cluster one.

### Characteristics Associated With the Clusters

In the second phase of this study, characteristics of the subgroups were compared to identify differences that might explain cluster membership and support program innovations and improvement. No significant differences were noted between clusters based on adult gender or age at START referral. The results of subgroup comparative analysis are displayed in [Table 2](#).

START cases may remain open longer as parents have additional pregnancy or risks for recurrence of CAN. Families in cluster one, intact families, had 16 subsequent births and only 2.7% of children experienced recurrence of CAN within six months. At intake families had an average of two NCFAS-G domains (of seven) rated as adequate to strong with 5.6 domains rated as adequate to strong at closure. Parents were rated as AWOL for less than one month. Although 38 parents were AWOL at closure, another parent who achieved sobriety kept the children safely at home. This group had the lowest number of 2.5 substances abused, 71.7% clean drug tests and only 18.7% needed residential treatment.

Families in cluster two, mostly reunified, had 20 children born during START but a low rate of recurrence of CAN at 1.8% within six months. Notably, children were on average two years of age at CPS report, significantly older than children in cluster three. Compared to cluster three, family mentors spent 20% more time each month in coaching parents on recovery and child safety. Parents attended an average of 7.7 community recovery support groups each month and had a rate of drug tests that were positive, tampered or no show at 34.1% similar to cluster one suggesting that they were engaged in active recovery efforts. No statistical difference was noted between clusters two and three on the number of drugs abused with similarly high rates of opiate and cocaine abuse and receiving detoxification and residential treatment. These findings suggest that this group had more severe SUDS treatment needs, received more intensive services, but made progress with 73.8% of primary

**TABLE 2** Cluster Group Comparisons

Variable	Cluster 1 Intact family	Cluster 2 Mostly reunified	Cluster 3 Rarely reunified	Totals	Test and <i>p</i> value
Children in cluster, <i>n</i>	370	274	222	866	
Children in cluster, %	42.7%	31.6%	25.6%		
Child born during START, <i>n</i> (%)	16 (4.3%)	20 (7.3%)	22 (9.9%)	58 (6.7%)	$\chi^2 .028$
Median age of children, years <sup>a</sup>	1.7	2.0	0.9	1.5	<i>F</i> .023
African American, %	36.2%	19.3%	24.8%	27.9%	$\chi^2 .000$
Caucasian, %	61.1%	75.9%	74.8%	69.3%	$\chi^2 .000$
Male, %	58.9%	49.8%	49.8%	53.7%	$\chi^2 .032$
Recurrence of CAN within 6 months of previous substantiation, %	2.7%	1.8%	9.5%	4.2%	$\chi^2 .000$
Reported by Family					
Intake: Average total NCFAS items rated as adequate or strong, <i>n</i> <sup>a</sup>	2.0	1.2	0.7	1.4	<i>F</i> .000
Closure: Average total NCFAS items rated as adequate or strong, <i>n</i> <sup>a</sup>	5.6	5.7	0.8	4.3	<i>F</i> .000
Family mentor contacts/month of START on recovery supports, <i>n</i> <sup>b</sup>	6.0	6.5	5.2	6.0	<i>F</i> .001
Family mentor contacts/month of START on child safety, <i>n</i> <sup>b</sup>	3.9	4.0	3.2	3.2	<i>F</i> .006
Report by Individual Parent					
African American, %	27.2%	13.0%	18.5%	20.1%	$\chi^2 .001$
Caucasian, %	71.6%	84.7%	81.0%	78.6%	$\chi^2 .006$
Average months parent rated as AWOL, <i>n</i> <sup>c</sup>	0.8	2.1	3.4	2.0	<i>F</i> .000
Average months parent rated as not progressing, <i>n</i> <sup>c</sup>	2.2	4.8	7.2	4.5	<i>F</i> .000
Final rating of AWOL	14.7%	15.3%	43.7%	23.5%	$\chi^2 .000$
Recovery support groups/ month of START services, <i>n</i> <sup>c</sup>	5.2	7.7	2.9	5.3	<i>F</i> .000
Drug tests that were positive, tampered or no shows, % <sup>b</sup>	28.3%	34.1%	63.1%	12.9	<i>F</i> .000
Average substances abused, <i>n</i> <sup>d</sup>	2.5	3.2	3.6	3.1	<i>F</i> .000
Received detoxification services, %	10.9%	30.1%	37.0%	24.8%	$\chi^2 .000$
Received residential services, %	18.7%	52.8%	50.0%	38.9%	$\chi^2 .000$

Note. Post-hoc Scheffe contrasts found significant differences in means: <sup>a</sup>between cluster 3 and clusters 1 and 2 (NS differences between clusters 1 and 2); <sup>b</sup>between clusters 2 and 3 (NS differences between clusters 1 and 2); <sup>c</sup>all clusters were significantly different; and <sup>d</sup>between cluster 1 and clusters 2 and 3 (NS differences between clusters 2 and 3).

parents achieving sobriety, 65.4% were reunified, and more than 90.0% made gains in parental capability and family safety.

To understand this mostly reunified group (cluster 2), families with children reunified (65.4%) were compared to those not reunified (34.6%). The non-reunified group had characteristics similar to cluster three (rarely reunified) such as 0.8 adequate or strong ratings on the intake NCFAS-G compared to 1.4 for those reunified. The non-reunified group had 6.1 monthly ratings of “not progressing” compared to 4.0 for the reunified group. The non-reunified group had 46.5% of drug tests found to be positive, tampered with or no shows compared to 27.9% in the reunified group. Nonetheless, parents in cluster two who failed to achieve sobriety and regain child custody, had 53.5% clean drug tests compared to 36.9% for cluster three.

Compared with cluster one, 2.6 times the number of parents in cluster three, rarely reunified, received detoxification services and 2.7 times received residential treatment as might be expected given the highest rates of opiate abuse (73.0%). On average parents were AWOL from the program or failed to make progress for at least ten months, with 43.7% being AWOL at case closure. Recurrence of CAN within 6 months was 3.5 to five times the rate in other clusters. All of the recurrence, except for six children placed with relatives, occurred during the open START case. At intake and at case closure, these families had at best one area of adequate functioning on the NCFAS-G, attended an average of 2.9 recovery support groups per month and had 63.1% positive, tampered or no show drug tests.

Although 77.6% of children remained with or were reunified with their biological parent by case closure, 294 children (22.4%) in clusters two and three remained in out-of-home care. Of these 294, 204 (69.4%) were in the permanent custody of relatives when the START case was closed. An additional 40 (13.6%) children were in the temporary custody of a relative and 50 (17.0%) remained in state custody at START case closure but continued state agency services. By February 2013, 27 START children achieved finalized adoption.

In [Table 3](#), the distribution of cluster membership across START sites is displayed; these differences are statistically significant ( $X^2$  [df = 6, N = 42] = 26.3,  $p = .000$ ). As shown in [Table 3](#), site A had more families in cluster one; sites B and D had the most families in cluster two and site C had more families in cluster three. The cluster distribution was likely influenced by the county specific profile and practices. For example, site A had a well-established comprehensive array of SUDS treatment services when START was initiated. In contrast, site C with very high rates of poverty had one day of outpatient behavioral health treatment per week in the county. Although there are differences in distribution, all sites had families achieving a range of results and falling into all cluster groups, suggesting an influence of sites without determination of cluster membership by site.

**TABLE 3** Characteristics of Four START Sites and Cluster Distribution

Characteristic Description	Site A Large Urban	Site B Urban	Site C Appalachian	Site D Rural
Child population <sup>a</sup>	172,289	40,057	2,671	10,475
Non-white, % <sup>a</sup>	38.5%	13.8%	1.4%	6.1%
Children living in poverty, % <sup>a</sup>	24.8%	27.3%	53.1%	27.3%
FFY 2009 children with substantiated CAN and parental SUDS as a risk factor, <i>n</i> <sup>b</sup>	1565	358	167	184
Families in this study, %	191	118	66	45
Cluster Group Membership				
Families in Cluster One: Intact Families, %	49.2%	33.1%	34.8%	33.3%
Families in Cluster Two: Most Reunified, %	20.4%	43.2%	28.8%	46.7%
Families in Cluster Three: Rarely Reunified, %	30.4%	23.7%	36.4%	20.0%

<sup>a</sup>Data retrieved June 21, 2014 from Annie E. Casey Foundation (2015).

<sup>b</sup>Kentucky Department for Community Based Services (2009).

## DISCUSSION

### Findings in Relationship to Previous Studies

In this section, contextual outcome data are provided for comparison while recognizing that this research was not intended to be an impact study. Drawing conclusions across studies is hampered by differences in measurement for a range of variables such as SUDS, treatment, family demographics, referral sources, and jurisdiction practices (White, 2008). Few studies use common measures between SUDS treatment and child welfare (Young, Nakashian, Yeh, & Amatetti, 2007).

Primary parents (mostly mothers) achieved an overall rate of sobriety at 58.8%. Although the measure of sobriety used in this study included goal achievement in three domains, Choi and Ryan (2006) found that 22.0% of parents and Green, Rockhill, and Furrer (2006) found that 50.0% of women involved with child welfare successfully completed SUDS treatment. Quick access to treatment was found by Green et al. (2006) to be associated with higher rates of sobriety; START findings also support that association (Huebner et al., *in press*). Quick access to intensive parental treatment services is consistent with the expectations of the Adoption and Safe Families Act (ASFA, 1997) that reasonable efforts and parental services are provided before moving toward child adoption after 12 to 15 months in state custody

Of the 496 children in this study who were removed from parental custody, 202 children (40.7%) were reunified with their parents by the close of START. This rate is similar to the rate of 44% found by Grella, Needell, Shi, and Hser (2009) but higher than the rate of 12% with recovery coaches found by Ryan et al. (2006). In this study, the rate of recurrence of CAN within 6 months of a prior substantiation was 4.2% compared with the federal standard of 6.1%

(U.S. DHHS, 2013); this standard does not specify rates of recurrence associated with parental SUDS.

There is evidence that participating in community recovery support is an important outcome of treatment that protects against relapse (Jason, Braciszewski, Olson, & Ferrari, 2005) and parents particularly in cluster two attended an average of 7.7 support groups per month. Parents in cluster two achieved high rates of sobriety and reunification with their children despite higher rates of substances abused and high levels of treatment such as detoxification and residential service. Family mentors provided 20.0% more coaching in sober living and child safety. Parents in cluster two seemed to invest more effort in recovery, consistent with the study by Blakey (2012). Mothers who were internally motivated, took responsibility for decisions and sought to learn in treatment were more often reunited with their children and termed 'thriving' mothers by Blakey (2012). In contrast, mothers who seemingly entered treatment only to comply but quickly disengaged were rarely reunified (Blakey, 2012).

### Implications for the START Program and Practice

This study was designed to build knowledge about the subgroups of families served in the START program and to use that knowledge to improve the program, illustrating the "apply and improve" phase of the framework (Framework Workgroup, 2014). The three clusters identified displayed distinct and meaningful differences for START leadership and practitioners. Cluster one, intact families, achieved results consistent with START expectations despite abusing an average of 2.5 substances and having five areas of weakness at intake on the NCFAS-G. However, they had less poly-substance abuse and more strengths noted at intake. All families were served with in-home services and retained child custody throughout treatment.

The most opportunity for program improvement seems to lie in understanding cluster two (mostly reunified) and cluster three (rarely reunified). Making practice level decisions in cases by front line workers is often ambiguous. For example, even parents that ultimately were AWOL and failed to achieve sobriety or reunification had intermittent clean drug tests that may confuse decisions to close the case. To infuse more objectivity into case decisions, START leadership and on-site teams are developing an assessment for use during case conferences after 6 or 12 months. Variables that differentiated the groups for the assessment included: number of strengths at intake and progress on the NCFAS-G; number of ratings as AWOL or not progressing; rate of drug tests that are positive, tampered or no show; recurrence of CAN; subsequent pregnancy; level of SUDS treatment received and abuse of opiates, cocaine or benzodiazepine. Case decisions based on an assessment of progress might include transferring the case to a non-START child welfare team, freeing the START team to take a new family. Permanency options might include more

rapid movement toward terminating parental rights and finding adoptive homes. Parents with higher likelihood of poor outcomes might benefit from another model of treatment, for example, adding a drug court component.

Additional measures may clarify and inform future decisions. For example, despite many similarities, parents in cluster two had older children than parents in cluster three. Perhaps parents in cluster two had stronger child bonding that motivated them to successfully manage significant SUDS while parents in cluster three with infants placed outside their custody may have failed to develop strong parental bonding. Adding a measure of attachment or an attachment-based parenting intervention (e.g., Suchman et al., 2010) may verify these speculations, suggest additional interventions, and/or improve results. Measures of readiness to change may contribute to understanding the profile of parents who might otherwise be labeled resistant or unmotivated (Girvin, 2004). Case reviews may elucidate agency practices associated with reunification and enhance learning and team decision making.

Site specific differences as shown in [Table 3](#) have implications for both the framework (Framework Workgroup, 2014), practice, and interpretation of these results. As interventions are replicated across sites with varying characteristics, differences in outcomes are likely even when, as is true with START, there is fidelity to the essential intervention strategies. The “apply and improve” phase of program evaluation is designed to monitor these differences and promote consistency. During monthly team meetings and quarterly state meetings, differences in START sites, the impact of these differences on implementation fidelity and outcome, and strategies to improve implementation are discussed among all the team members. Barriers such as differences in court practices, need for community-based services such as housing, or personnel issues may be mitigated through team efforts. Nonetheless, with a complex integrated program such as START, it is difficult to control for site influence and suggesting a need for cautious interpretation of results. In contrast, such site specific differences present an opportunity to learn about site specific implementation, family needs, and program impact.

### Implications for the Children’s Bureau Framework

This study illustrates the “apply and improve” phase of the framework (Framework Workgroup, 2014). A strength and innovation of the framework is the inclusion of an ongoing program evaluation component aimed to continually improve programs and agency decision making. This phase extends the evaluation process beyond the summative evaluation phase and embeds a link from program evaluation to CQI. However, to successfully link program evaluation to CQI requires an allocation of resources and expertise that is currently undefined. It may be particularly important to embed ongoing program evaluation within agencies to sustain program results and support decisions

through predictable child welfare challenges such as budget deficits and leadership change.

Cluster analysis, as used in this study, contradicts the notion that child welfare populations are homogenous and will respond similarly to evidence supported interventions. Subgroup research could be further enhanced by multivariate statistical designs that control for severity while elucidating the strength of various predictive variables. Conversely, the results of this study illustrate the complexity of families served in integrated programs and the results engender many more questions. For example, what factors contributed to the few families in cluster three that did reunite with their children? Documentation of decisions and conditions at 6- or 12-month point in the case, as planned, may contribute to future research.

### Limitations and Strengths

The study design does not support causal conclusions that START intervention caused the outcomes, only that START was associated with these results. The outcome indicators used to develop the clusters were those that were available, collected throughout the program and logical given the research objectives, but other demographic or service indicators might produce different cluster groups. Because of the exploratory aims, multiple comparisons were completed without adjusting the statistical significance level, suggesting that some differences may have occurred by chance.

Despite these limitations, this research demonstrated the role of ongoing program evaluation to improve evidence supported interventions and related agency outcomes. Such rigorous attention to accountability is respectful of tax payer funding and limited child welfare resources. Importantly, this research was completed within an integrated program between child welfare and SUDS treatment that simultaneously focused on important adult and child outcomes in the context of the family.

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