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Intensive Family Preservation Services: Demonstrating Placement Prevention Using Event History Analysis

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Key words: event history analysis; family preservation; outcomes; placement; placement prevention; risk factors.

ABSTRACT

Objective: This study reexamines the ability of Intensive Family Preservation Services (IFPS) to prevent out-of-home placements of children in abusive or neglectful families. Method: A retrospective, population-based design was used. Subjects comprised a statewide, 6-year, archival population of high-risk CPS children. The study assured a high degree of treatment fidelity among service providers, controlled various risk factors that may have adversely affected findings in previous studies, and employed event history analysis to examine treatment effects. Results: IFPS significantly reduced placement rates or delayed placements of children when compared to children of the same risk level but who received traditional child welfare services. Treatment effects increased as risk increased. Conclusion: In contrast to previous research, IFPS is shown to be effective in reducing out-of-home placements when model fidelity is high and the service is appropriately targeted.

Key words: event history analysis; family preservation; outcomes; placement; placement prevention; risk factors.

INTRODUCTION

Intensive family preservation services (IFPS) are time-limited (usually 4 to 6 weeks), intensive, in-home services designed to prevent the unnecessary removal of children from home as a result of abuse or neglect (Kinney, Haapala, & Booth, 1991). This study responds to previous studies that challenge the effectiveness of IFPS in preventing out-of-home placements of children at high-risk of placement prior to services. Many of those studies utilized experimental designs, and attempted to achieve a high degree of scientific rigor (Yuan, McDonald, Wheeler, Struckman-Johnson & Rivest, 1990; Feldman, 1991; Shuerman, Rzipnicki, Littell & Chak, 1993; and Department of Health and Human Services, 2001). Studies employing experimental designs have produced equivocal findings, begging a review of the designs and methods employed. Evidence exists that the research to date may have failed to detect treatment effects rather than demonstrating a lack of treatment effects (Fraser, Nelson & Rivard, 1997).

Design, model fidelity and implementation issues may have compromised findings in these studies (Fraser, Nelson & Rivard, 1997; Heneghan, Horwitz & Levinthal, 1996; Pecora, Fraser, Nelson, McCroskey & Meezan, 1995; Rossi, 1992). Rossi (1991, 1992) suggested that equivocal findings in early evaluations might have been due to differences in experimental and control groups with respect to true risk of placement prior to receiving IFPS. Inadequate attempts by workers to judge risk and/or refer only high-risk cases resulted in lower-risk cases being served. The most recent federal study (DHHS, 2001) attempted to resolve this issue using a specially designed risk/referral instrument, but the authors report that the new tool did not succeed in the identification of high-risk families for random assignment (DHHS, 2001, Ch 9.2).

Theoretically, IFPS is intended for the highest risk families. However, low placement rates for both experimental and control groups suggest that lower-risk families were actually

receiving IFPS in most previous studies. Under these circumstances, treatment effects would be mitigated when placement prevention is used as the dependent variable.

A number of reviewers (Berry, 1992; Meezan & McCroskey, 1996; Fraser, Walton, Lewis, Pecora & Walton, 1996; Rossi, 1991; Wells & Whittington, 1993) called for analysis of questions relating to family issues, family functioning, and multiple family outcomes to clarify the basis for placement prevention rather than relying solely on the placement prevention statistic. However, addressing criticisms in the literature concerning the impact of family preservation services requires that placement prevention be included as an outcome.

Problems have also been noted with respect to statistical and analytic approaches employed in past research. Fraser, Nelson, and Rivard (1997) conducted a meta-analysis of treatment effects in the treatment literature relating to mental health, juvenile services, and child welfare (including IFPS) and concluded that the studies might have failed to detect treatment effects rather than determining that treatment effects did not occur. They suggested that the desirability of large samples for purposes of increasing statistical power might have fallen victim to variations in treatment fidelity among the programs comprising the samples, thereby inflating the variance attributable to the dissimilarity of the programs in relation to the variance due to treatment. The result would be a decreased likelihood of detecting any treatment effect.

In summary, these studies of IFPS reveal several issues that could conceal treatment effects. Pooling data from dissimilar models could increase the amount of model-induced variance disproportionately as compared to variance due to any treatment effect. Second, failure to target high-risk families may result in poor targeting of the service to the intended families and generally low placement rates irrespective of service. Third, violating random assignment protocols may lead to the non-equivalence of experimental and comparison groups. First

suggested by Rossi (1991, 1992), this problem recurred in the most recent federal study (DHHS, 2001) where a negotiated violation rate of random assignment was permitted. Finally, the use of "placement prevention" as an outcome variable is problematic if: 1) the sample is not at high-risk of placement; 2) fidelity to the treatment model is weak; or 3) placement is necessary to protect the child and therefore is the appropriate case outcome. This study addresses these issues by demonstrating a high degree of model fidelity, assuring high-risk among served families, and employing a retrospective, population-based design. Placement prevention is retained as the outcome measure for the sake of comparability.

METHODS

Study Sites

Fifty-one of North Carolina's 100 counties comprised the study sites. These counties have IFPS available through contract providers, but in no case is the service available in adequate supply to serve all high-risk referrals. Services available to families not receiving IFPS are typical public and contract agency services such as counseling and parent skill training, mental heath referral and service, protective services day care, foster care, and the like. In many cases, including high-risk cases, these services are provided in sufficient quantity that county departments of social services (DSSs) permit the child to remain in the home under protective supervision, constituting an approved alternative to placement.

Study Design

Issues identified as problematic in previous research are addressed specifically in this study through the use of a retrospective, population-based design that selected cases on the basis of a standardized child protective services (CPS) risk assessment instrument. This design allowed the comparison of the treatment outcome (placement prevention) for all children served

by the IFPS program and all similar children who did not receive the service. No changes in routine IFPS and non-IFPS case practices were implemented to accommodate design issues.

Population and Subjects

Data were acquired from several statewide information systems including the IFPS-specific Management Information System (IFPS-MIS), the CPS risk assessment information from the North Carolina Child Abuse and Neglect System (NCCANS), and child placement data from the state information system used to track experiences of children entering out-of-home placement (for a description of this database, see Usher, Locklin, Wildfire, & Harris, 2001). Selection criteria included being referred by a county DSS to IFPS on the basis of a substantiated, high-risk maltreatment report. The study population included all families from counties offering IFPS with children who received their first IFPS intervention between July 1, 1994 and March 31, 2001 and their first substantiated report after July 1, 1993 and before March 31, 2001. The comparison population included all other families in the same counties with children who experienced their first substantiated report after July 1, 1993 and before March 31, 2001. The comparison families did not receive IFPS. The July 1, 1993 date was imposed on both IFPS and non-IFPS populations because automated placement history data were available only after that date.

To conduct the chosen analyses, it was necessary to link only one substantiated report to each child. When children had only one substantiated report during the study period, that report was used as the report linked to the child for both the study and comparison populations. For children who had more than one substantiated report during the study period and who received IFPS, the substantiated report closest in time and before referral to IFPS was selected as the report linked to the child's IFPS intervention. For children in the comparison population with

more than one substantiated report, the substantiated report linked to the child was selected randomly in proportion to the substantiated report number that was linked to the IFPS intervention for IFPS children with multiple substantiated reports. This strategy permitted the subsequent comparison of subgroups of children with the same histories of substantiated reports.

An operational definition of "imminent risk or placement" was imposed retrospectively using ratings on the standardized, CPS risk assessment instrument (completed for every substantiated report of maltreatment). A risk rating of "high" mandates removal of the child unless an approved alternative plan that assures child safety is immediately implemented. IFPS qualifies as such a plan. (For validation of this instrument's high-risk determination and its relation to placement, see Usher, Wildfire, & Gogan, 2001.) Only families with "high" risk ratings were included in the study, whether or not they received IFPS.

In the study sites, IFPS operates under a statutorily defined model. The standards specify response timeframes, length of service, number and distribution of contact hours, and the like. In the "high" risk IFPS study sample, 89% of families received their first home visit within 2 days of referral, and for all families, the mean response time was 1.67 days (SD = 5.39). Two-thirds of cases (67%) closed within the mandated 42-day service period, the sample mean being 38.33 days (SD = 12.95). Services were "front loaded," averaging 16.3 hours during the first week, gradually declining to 13 hours per week. Throughout the typical 73.1 (SD = 34.47) hours of service provided, about half of that time (35.4 hours, SD = 16.79) was spent in face-to-face contact with the family. Although these data confirm a high degree of model fidelity among the IFPS service providers, in order to comply strictly with the IFPS model definition cases were removed from the study population that did not meet strict fidelity requirements (first family visit occurring within 2 days of referral and case closure within 6 weeks of referral) so that group

differences could not be attributed to cases that received a few extra days of service. The final study sample comprised 542 high-risk children who received IFPS, and the comparison group comprised 25,722 high-risk children who did not receive IFPS, but resided in the same counties.

Outcome Variable

Placement prevention is defined as the absence of out-of-home placement within a period of one year from the beginning of IFPS for the IFPS treatment group, and for a period of one year from the date of a substantiated report of abuse and/or neglect for children in the non-IFPS comparison group. The one-year time period to monitor cases was chosen because it is comparable to existing studies to which this study responds, and it is the typical measurement interval of interest to programs or services that are funded or evaluated on an annual basis.

Methods of Analysis

Because this study responds specifically to existing literature that used placement prevention as the outcome measure, event history analysis was employed to assess differences in placement rates and patterns for children in this study. Fraser and colleagues first suggested this analytic technique for use in IFPS evaluations in the early 1990s (Fraser, Pecora, & Haapala, 1991; Fraser, Pecora, Papuang, & Haapala, 1992). Because the baseline hazard function is unspecified, proportional hazards models are popular for modeling changes in the distribution of survival times as a function of the predictor variables. Rather than calculating the difference in placement rates at the end of a one-year follow-up period, event history analysis computes the relative risk of placement over time. Further, this type of analysis allows for statistical censoring, thereby retaining more information about each case that can be used until the time it is dropped from follow-up. Survival curves were generated using life tables and are presented graphically as one minus the survival function to illustrate the cumulative risk of placement. The

data also were examined using a Cox proportional hazards regression model (Cox model) to examine the associations between each independent variable and the hazard rate for placement while holding all other independent variables constant, and a Cox regression model with time-dependent covariates to examine time-related interactions.

RESULTS

Differences Among Groups

Cases that were referred to IFPS were compared to cases that did not receive IFPS to determine if there were systematic differences in CPS system behavior. Table 1 reveals that there were no statistically significant differences between the IFPS and comparison cases for gender and county size. IFPS and comparison cases did differ with respect to race, age and type of maltreatment. About three fifths (59%) of IFPS cases were white, compared with 54% of non-IFPS cases. IFPS cases were more likely to be younger than non-IFPS cases (47% vs. 53% age 0-5 and 28% vs. 36% age 6-10). Children receiving IFPS were more likely to be substantiated for injurious environment (44% vs. 39%) whereas non-IFPS cases were more likely to be substantiated for general neglect (44% vs. 41%). More than two fifths (44%) of IFPS cases had experienced one or more prior substantiated reports of maltreatment, compared with only 19% for the non-IFPS cases. Further, 17% of IFPS cases had experienced one or more prior high-risk substantiated reports, compared with only 6% for the non-IFPS cases. Both of these differences were statistically significant. Data were also examined for prior placement events and a significantly higher proportion of IFPS cases (8%) had experienced a prior spell under "placement authority," compared to the non-IFPS cases (2%).

These comparisons suggest that IFPS programs serve disproportionately larger numbers of cases with high-risk factors compared to the rest of the CPS service system in the same

counties. Thus, it appears that the referral systems in the study sites are responsive to the definitions of client eligibility and are referring high-risk and multiple-risk children to IFPS. This finding is important, for comparison of the IFPS cases to the non-IFPS cases without adjusting for risk would result in a high-risk bias among IFPS cases. It is likely that such a bias would result in higher placement rates among IFPS cases due to the multiple risk factors associated with placement. Such a bias would reduce the likelihood of detecting a treatment effect for IFPS since non-IFPS cases would have a lower risk of placement, a priori.

Survival Curves

The curves in Figures 1, 2 and 3 present varying combinations of risk factors, and illustrate that by focusing only on the difference in the rate of placement at the end of one-year post-service, without controlling for known risk factors or the passage of time, it could be concluded that IFPS is ineffective. However, by controlling for risk and accounting for time, a different picture of IFPS emerges. Each figure displays the proportion of children placed out-of-home within one year. The higher the curve goes during the measurement period, the worse the placement outcomes for the population represented in the curve.

Figure 1 shows the placement curves for all cases without controlling for other risk factors. IFPS and non-IFPS cases had similar placement rates at 365 days, at which point 27% of children in both groups experience a placement. However, IFPS cases had a lower initial placement rate that sustained for 330 days, and a significantly lower placement rate when measured at 6 months. If placement outcomes were measured at 365 days, it would appear that IFPS had little effect on placement outcomes.

Figure 2 displays the placement curves for IFPS and non-IFPS cases that had one or more prior spells under placement authority. When the analysis controlled for prior placement

authority, IFPS significantly reduced the rate of out-of-home placement. At 365 days, 19% of IFPS cases had experienced a placement compared to 44% of non-IFPS cases.

Figure 3 displays the placement curves for IFPS and non-IFPS cases that had one or more prior substantiated reports. When the analysis controlled for prior substantiated reports, IFPS significantly reduced the rate of out-of-home placement, compared to non-IFPS cases. At 365 days, 29% of IFPS cases had experienced a placement compared to 37% of non-IFPS cases. It can be seen from the curve that the observed treatment effect of IFPS was greatest until 240 days, after which time it essentially paralleled traditional child welfare service programs, but maintained an 8% lower placement rate throughout the remainder of the 365 day measurement period. This difference increased when only high-risk prior substantiations were considered, such that at 365 days, 29% of IFPS cases had experienced a placement compared to 43% of non-IFPS cases. Thus, when risk factors were controlled during the analysis in both treatment and comparison cases, IFPS statistically outperformed traditional child welfare services in every comparison by preventing or delaying out-of-home placement.

Cox Regression Models

A Cox proportional hazards regression model was estimated to identify factors associated with the hazard for out-of-home placement within 12 months for the same IFPS and non-IFPS cases. The initial model of main effects (not illustrated because the differences among coefficients for main effects in the initial Cox model and subsequent models presented in Table 2 are trivial) indicated that the model fit the data well (model overall chi-square=1244.504, df=17, $p<.001$), and that when all variables in the model were held constant, a significant and positive treatment effect was observed for IFPS. The hazard rate for IFPS indicated that children receiving IFPS were 21% less likely than non-IFPS children to experience a placement within 12

months. The model also demonstrated that experiencing a new high-risk substantiated report within 12 months resulted in a 23% increase in the hazard rate for placement. These hazard rates can be thought of as the average effect over the 12-month follow-up period (Allison, 1995, p. 155).

A second Cox model was estimated adding the interaction between receiving IFPS and receiving a new high-risk substantiated report. The results are presented in Table 2 as Model 2. This model demonstrated that children who received IFPS and did not experience a new high-risk substantiated report within 12 months experienced an average reduction in the hazard rate for placement of 32%. Children who received IFPS and also experienced a new high-risk substantiated report within 12 months experienced an average increase in the hazard rate for placement of 70%. Similarly, children who did not receive IFPS and experienced a new high-risk substantiation within 12 months experienced an average increase in the hazard rate for placement of 16%. Thus, analysis of the interaction revealed a significant, positive treatment effect for the large majority (86%) of the children receiving IFPS.

Figure 4 displays adjusted placement curves based on this second Cox model (Model 2, Table 2). Lines are plotted for the IFPS and non-IFPS cases at the mean of each covariate entered in the model. Figure 4 can be compared to Figure 1 where no independent variables were controlled. When the overall curves were adjusted on the basis of risk, as defined by the model covariates, families that received IFPS experienced a substantially lower rate of out-of-home placement than did non-IFPS cases, on average, for the entire 365-day follow-up period.

The convergence of curves in Figure 1 suggests that a violation of the proportional hazards assumption might have occurred with these data. However, a violation of this assumption does not create a problem for model estimation and significance testing (Allison,

1995, p. 154). A final Cox model with time-dependent covariates (i.e., a model including the interaction of IFPS with time) was estimated and the results are presented in Table 2 as Model 3. Hazard rates for the treatment groups were computed at 90-day intervals from the model coefficients and are presented in Table 3. This Cox model confirms the positive treatment effect for the 86% of IFPS children who received IFPS and did not experience a new high-risk substantiated report within 12 months. However, this model further indicates that the treatment effect slowly diminishes over time, and by 270 days after referral to IFPS a 5% increase in the hazard for placement is estimated for children who received IFPS and did not experience a new high-risk substantiated report within 12 months.

All but one independent variable (gender) in the final model significantly affected the hazard rate. The hazard rate for placement within 12 months for both the IFPS and non-IFPS cases was increased by 36% when the child had experienced one or more prior placement authority spells, by 55% with one or more prior substantiated reports, and by 27% with one or more prior high-risk substantiated reports. Looking at county-related demographics, children served in medium sized counties experienced an 8% decrease in the hazard rate for placement while children served in large counties experienced an increase in the hazard rate for placement (22%).

When the type of maltreatment was considered, cases of neglect and injurious environment experienced statistically significant reductions in the hazard rate for placement, 30% and 42%, respectively. Cases having multiple types of maltreatment experienced an increase in the hazard rate for placement (16%), while the hazard rate for sexual abuse cases was not affected. Children in the 0 – 2 age range experienced the highest rate of placement; each older age category experienced a reduced hazard rate, ranging from a 36% to 46% decrease in

the hazard rate for placement. Non-white children experienced an 8% increase in the hazard rate for placement when compared to white children.

DISCUSSION

The results of this study contradict previous research on the effectiveness of IFPS. By studying a population of cases that fits the intended client definition (CPS high-risk children), by assuring a high degree of treatment fidelity among service providers (using quality assurance statistics on 100% of providers and cases), by controlling for risk factors that affect placement rates (CPS risk rating, prior placements, prior substantiations, prior high-risk substantiations), and by using an analytic strategy that accounts for time by treating the dependent variable as dynamic rather than static (event history analysis), IFPS is shown to outperform traditional child welfare services when success is defined as placement prevention. Furthermore, when a Cox model is developed based on the aforementioned risk factors, as well as other factors at work in the treatment environment and an adjusted placement curve is constructed on the basis of the IFPS variable, IFPS is shown to be superior to traditional services when all variables are held constant at their respective means.

It is noteworthy that when no effort is made to account for the multiple influences of these independent variables (as seen in Figure 1), the effect of IFPS appears to wane at the end of the one-year measurement period. Examination of the curves in Figures 1, 2 and 3 depicting cumulative risk of placement suggest that there is an attrition period that occurs between 4 and 7 months after the IFPS intervention, depending on the variables in question. This attrition is reflected in the significant interactions between IFPS and the occurrence of a subsequent high-risk substantiation (Table 2, Model 2), and the interactions of IFPS with time, and time with the occurrence of a subsequent high-risk substantiation (Table 2, Model 3).

The pessimistic interpretation of these data is that IFPS has waning durability. A more optimistic interpretation is that there is a period of vulnerability after IFPS that may be predictable, and may be addressed in order to ameliorate the vulnerability. Policy analysts and treatment specialists should explore the possibility of post-IFPS services (sometimes referred to as booster shots by IFPS programs) offered to all families that have received IFPS, so that the initial placement prevention effect can be sustained while assuring child safety through family contact and additional services when necessary.

An alternative approach to stemming attrition might be to extend the initial treatment period for a few days, if the family is not quite ready to have intensive services withdrawn. In this study, cases were removed from the analysis that did not adhere to a strict definition of model fidelity. Some of those cases were eliminated because the service period had been extended, the effect of which was to modestly increase the treatment effects of IFPS when compared to non-IFPS cases. The challenge to this service approach is to establish clear policies covering reasons for service extension.

Although the design used in this study addresses some of the problems encountered in previous research (e.g. random assignment, high-risk targeting), there are limitations. Model fidelity was high with respect to structural components of the model (e.g., case loads, length of service), but there is still variation among providers with respect to actual services delivered within the specified structure. The high-risk case identification procedures used in this study appear to have been successful as reflected in the CPS system response to those cases, and concurrent validity of the risk assessment procedures has been established (Usher, Wildfire & Gogan, 2001). However, like most risk assessment instruments, more research is needed to firmly establish this instrument's reliability and validity. The problem remains of knowing, a

priori, which families are truly at imminent risk, and of having practice and research instruments that operationalize the concept. Future research should focus on these issues as well as on the sustainability of child safety within families that have received IFPS, and on the combinations of factors (those included in the Cox models presented in this study and other variables that may be present in other program settings) that predict the likelihood of declining family functioning leading to future placement. Future research also must confirm this study's findings in different settings where program fidelity is high and services are appropriately targeted to high-risk families.

Conclusion: IFPS can be effective when appropriately targeted and implemented consistently. When success is defined as placement prevention and risk is controlled, IFPS outperforms traditional child welfare services. The treatment effects are strongest among the highest risk cases. In this study, treatment effects maintained for the large majority of families (86%) but diminished over time in potentially predictable ways for remaining families. This is an important finding because the policy goal of placement prevention, in relation to the 6-week IFPS model, should be linked to the highest risk cases in which services can be safely delivered within the home. However, there are likely to be other, more useful and more sustainable definitions of success for IFPS than placement prevention. In fact, the notion that children can be protected from unnecessary placement is only functional when there are reasonable alternatives to placement that render them unnecessary, such as IFPS or other family strengthening services. Future research should help IFPS model proponents identify the families that will need supportive services after the time-limited intervention in order to sustain initial successes in maintaining family continuity.

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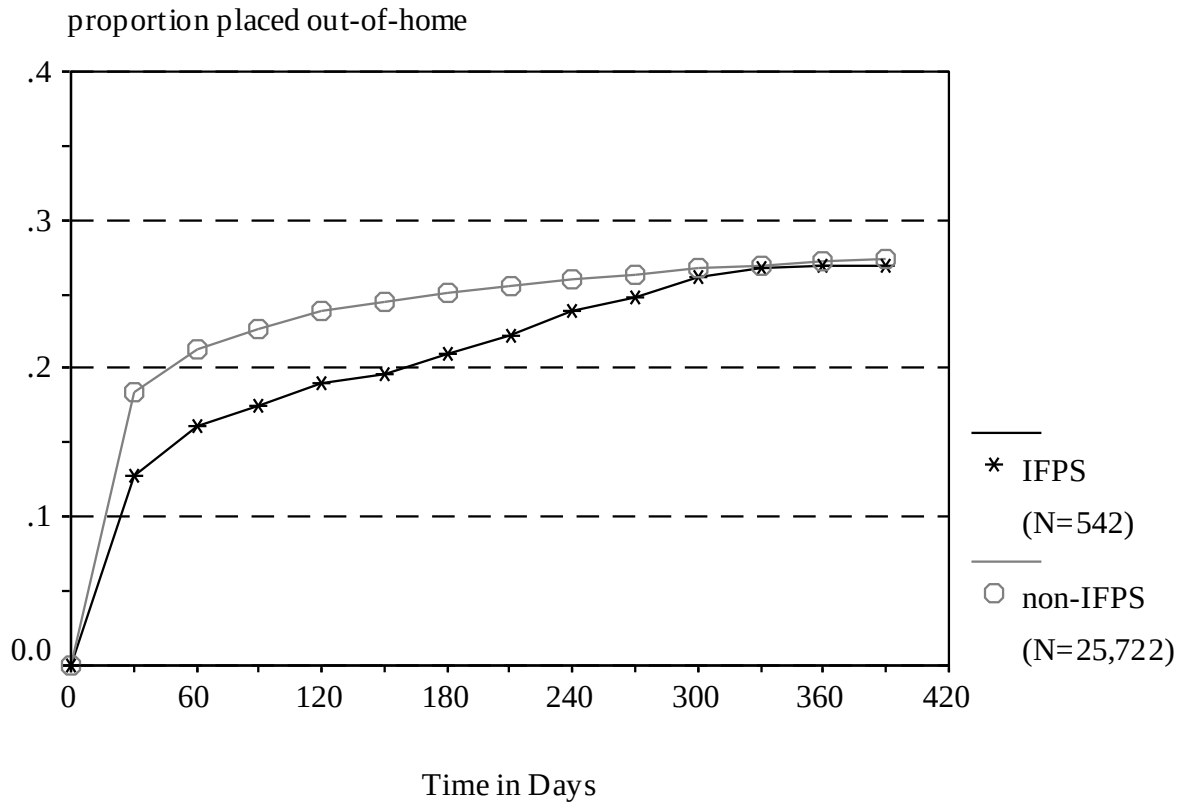
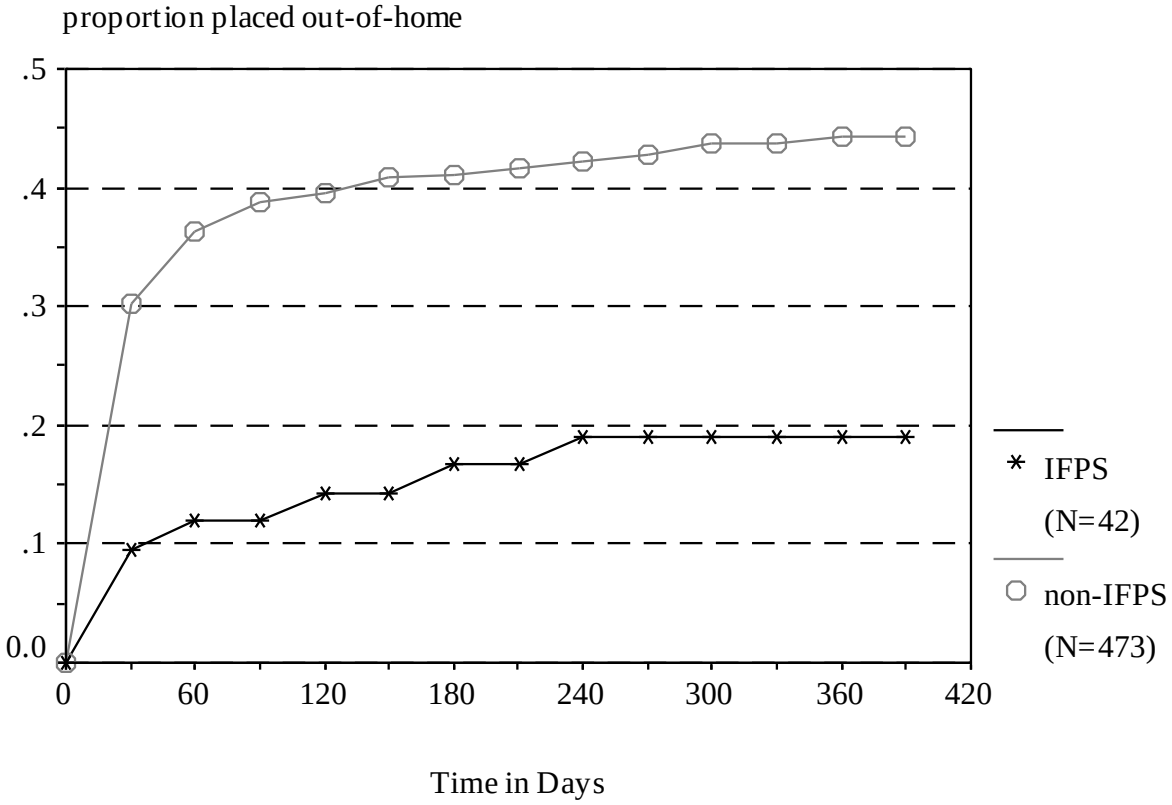
Figure 1—Cumulative Risk of Placement for IFPS and Non-IFPS Cases



6 mos: Wilcoxon=7.649, df=1, p<.01

12 mos: Wilcoxon=1.693, df=1, ns

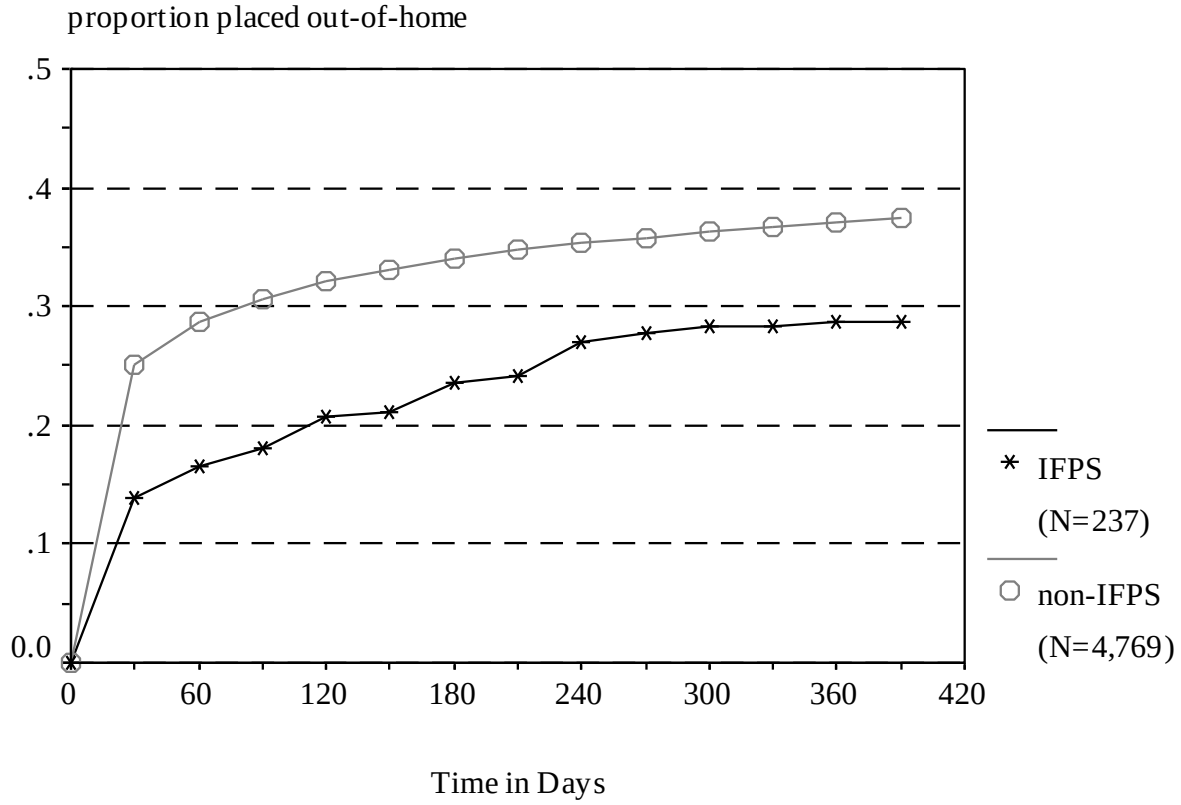
Figure 2— Cumulative Risk of Placement for IFPS and Non-IFPS Cases with One or More Prior Spells Under Placement Authority



6 mos: Wilcoxon=9.788, df=1, p<.01

12 mos: Wilcoxon=10.326, df=1, p<.01

Figure 3— Cumulative Risk of Placement for IFPS and Non-IFPS Cases with One or More Prior Substantiations



6 mos: Wilcoxon=14.818, df=1, p<.001

12 mos: Wilcoxon=12.055, df=1, p<.001

Figure 4—Adjusted Cumulative Risk of Placement for IFPS and Non-IFPS Cases from the Cox Proportional Hazards Regression Model

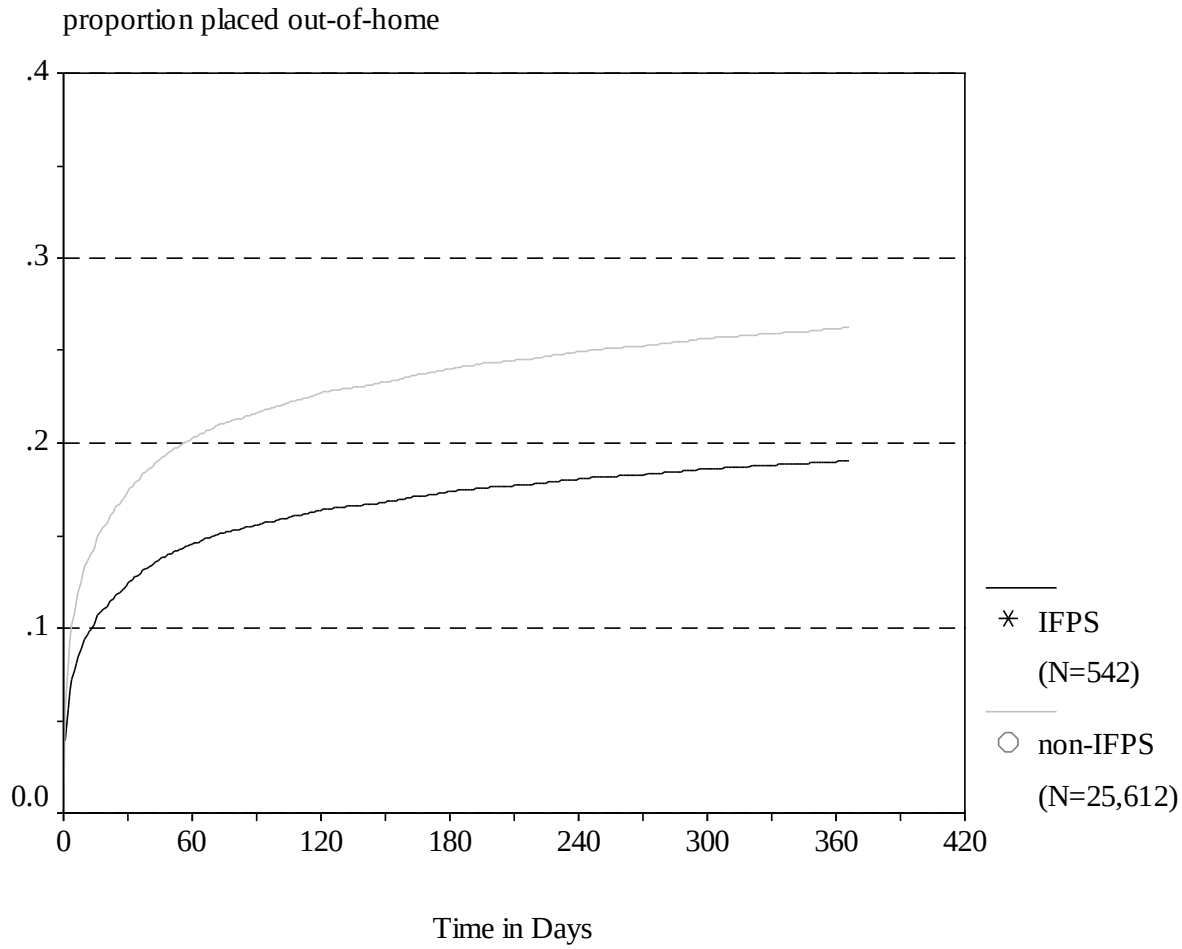


Table 1—Child, County, and Case-Related Demographics for IFPS and Non-IFPS Cases

	IFPS		Non-IFPS			
Variable	**#**	**%**	**#**	**%**	**df**	**χ^2**
Gender					1	.068
Male	266	49	12,769	50		
Female	276	51	12,953	50		
Age at CPS report/referral to IFPS					4	9.918*
0 – 2	163	30	8,387	33		
3 – 5	94	17	5,203	20		
6 – 10	150	28	6,534	26		
11 – 12	55	10	1,902	7		
13 plus	80	15	3,586	14		
Race					1	4.405*
White	319	59	13,972	54		
Non-white	223	41	11,750	46		
Type of maltreatment					4	17.058**
Physical/emotional abuse	44	8	2,134	8		
Sexual abuse	12	2	1,232	5		
Neglect	220	41	11,406	44		
Injurious environment	239	44	10,114	39		
Multiple types	27	5	836	3		
County size					2	4.504
Small	86	16	3,290	13		
Medium	240	44	11,733	46		
Large	216	40	10,699	42		
Prior placement authority spell					1	96.449***
No prior spell	500	92	25,249	98		

1+ prior spells	42	8	473	2		
Prior substantiated report					1	218.265***
No prior substantiation	305	56	20,953	82		
1+ prior substantiation	237	44	4,769	19		
Prior high risk substantiated report					1	100.303***
No prior high risk substantiation	450	83	24,110	94		
1+ prior high risk substantiation	92	17	1,612	6		
New high risk substantiated report within 12 months					1	203.700***
No new high risk substantiation	466	86	24,943	97		
1+ new high risk substantiation	76	14	779	3		

*p < .05. **p < .01. ***p < .001.

Table 2—Factors Associated with Placement in Foster Care after a Substantiated CPS Report/Referral to IFPS: Cox Regression Models Predicting the Hazard for Placement During 12 Months of Follow-up (IFPS N=542, Non-IFPS N=25,612)

	Model 2			Model 3		
	B	**Wald χ^2**	**Exp(B)**	**B**	**Wald χ^2**	**Exp(B)**
Gender (male)						
Female	-.013	.293	.987	-.013	.311	.987
Age at report/referral (age 0 – 2)						
Age 3 – 5	-.542	254.837	.582***	-.542	254.645	.582***
Age 6 – 10	-.612	360.469	.542***	-.615	363.659	.541***
Age 11 – 12	-.540	114.819	.583***	-.539	114.305	.583***
Age 13 plus	-.444	134.306	.641***	-.447	135.752	.640***
Race (white)						
Non-white	.075	9.583	1.078**	.074	9.208	1.077**
Type of maltreatment (physical/emotional abuse)						
Sexual abuse	-.045	.475	.956	-.041	.398	.960
Neglect	-.362	78.434	.696***	-.362	78.241	.696***
Injurious environment	-.540	163.849	.583***	-.541	164.374	.582***
Multiple types	.137	4.429	1.146*	.144	4.939	1.155*
County size (small)						
Medium	-.077	3.855	.926*	-.080	4.260	.923*
Large	.204	27.423	1.227***	.199	25.945	1.220***
Prior placement authority spell (no prior)						
1+ prior spell	.311	18.883	1.365***	.303	17.960	1.355***
Prior substantiated report (no prior)						
1+ prior substantiation	.439	171.401	1.551***	.439	171.773	1.552***

Prior high risk substantiated report (no prior)						
1+ prior high risk substantiation	.232	23.058	1.261***	.237	23.992	1.267***
New high risk substantiated report within 12 months (no new sub.)						
1+ new high risk substantiations	.144	5.539	1.155*	-.721	62.700	.486***
IFPS (non-IFPS)						
IFPS	-.390	15.710	.677***	-.487	19.848	.615***
Interaction of IFPS with new high risk substantiated report within 12 months	.776	15.790	2.174***	.628	8.191	1.874**
Interaction of IFPS with time	—	—	— —	.002	5.320	1.002*
Interaction of new high risk substantiated report within 12 months with time	—	—	— —	.011	442.683	1.011***
	Beginning –2 Log Likelihood: 143135.620			Beginning –2 Log Likelihood: 143135.620		
	Ending –2 Log Likelihood: 141952.952			Ending –2 Log Likelihood: 141528.753		
	Overall Chi-square: 1260.589, df = 18, p < .001			Overall Chi-square: 2171.491, df = 20, p < .001		
	7136 events, 72.4% censored			7136 events, 72.4% censored		

Note: Reference groups in parentheses. Degrees of freedom for each variable is one.

*p < .05. **p < .01. ***p < .001.

Table 3—Estimated Hazard of Placement for Treatment Groups from Cox Regression Model with Time-Dependent Covariates Presented at 90 Day Intervals

	Exp(B)				
Treatment Group	**0 days**	**90 days**	**180 days**	**270 days**	**360 days**
Non-IFPS, no new HR substantiation	1.000	1.000	1.000	1.000	1.000
Non-IFPS, new HR substantiation	0.486	1.309	3.522	9.478	25.508
IFPS, no new HR substantiation	0.615	0.736	0.881	1.054	1.262
IFPS, new HR substantiation	0.560	1.804	5.812	18.728	60.340