Epidemiology of Child Maltreatment Recurrences

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The recurrence of child maltreatment following a report to Child Protective Services is one index of the effectiveness of the public child welfare system. This article reports on the analysis of the patterns and frequency of recurrences of substantiated instances of maltreatment in an urban child welfare system. Results from survival analyses indicated that risk of recurrence was greatest during the first 30 days following a report, that risk declined with time and remained relatively low for 2 years following the termination of services, and that recurrence was dependent on the type of maltreatment. Most recurrence families experienced only one recurrence, but a clustering effect was apparent for families that experienced multiple recurrences.

Child maltreatment is a serious, prevalent, and costly social problem.[1] Approximately one million American children are confirmed by Child Protective Services (CPS) agencies as abused and neglected each year;[2] many grow into adults with serious social, health, and mental problems.[3] Children who experience multiple episodes of child maltreatment are even more likely to experience both short- and long-term negative consequences. In fact, the very premise on which child maltreatment reporting systems were founded was to arrange for the protection of children and to reduce the likelihood that children would be repeatedly maltreated.[4] However, as a recent review of the recurrence literature has pointed out, as many as 50 percent of children may be repeatedly maltreated in part because the system has been unable to respond effectively.[5] This failure may also have contributed to increases in the foster care population and the death of children.[6]

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In response to this child protection crisis, the U.S. Advisory Board on Child Abuse and Neglect proposed a new and comprehensive strategy for protecting American children.[7] An important element of this new system is the use of effective risk-assessment systems to aid casework decisions. Much of the attention of risk-assessment development has focused on the validation of instruments that predict the likelihood of future recurrences.[8]

In the broader child maltreatment literature at least 68 studies over the past 20 years have involved some examination of recurrence.[9] Most recurrence-related studies have focused on trying to predict recurrence, testing the predictive validity of risk-assessment instruments, or evaluating the effectiveness of child maltreatment or family-preservation related intervention and treatment programs. Very little attention has been paid to extending knowledge about the epidemiology of child maltreatment recurrences. Yet, a major benefit of an epidemiological study is to understand the pattern of a condition as a first step to develop strategies to prevent it. Understanding more about the times when families may be most "at risk" for recurrences can lead to decisions about the needed intensity and length of services to protect most effectively maltreated children.

This article will summarize results from a study aimed at elucidating the epidemiology of child maltreatment recurrences among families known to public child protective services.[10] Specific objectives of the analyses for this article are to identify time intervals that had high child maltreatment recurrence rates, determine if the risk of recurrence declined over time, ascertain whether the pattern of recurrences over time was dependent on the type of maltreatment (physical abuse versus neglect) of the index incident, and determine whether there were patterns to multiple recurrences.

Literature Review

An exhaustive search of the literature identified 68 recurrence-related studies.[11] However, only four studies reported on the pattern of recurrences using epidemiological statistical techniques,[12] and only four studies have reported on the frequency of recurrences.[13] The social work field at large is just beginning to take advantage of epidemiological methods such as survival analysis, a set of statistical procedures specifically developed to study the pattern and correlates of longitudinal or duration data.[14] However, survival analysis has been used more frequently to describe patterns of foster care placement and reentry than child maltreatment recurrences.[15] Understanding more about the pattern of recurrences over time should help CPS administrators in long-range planning regarding the number of families who will be expected to reenter the CPS system, as well as in the timing of these new, confirmed incidents.

Rates of recurrence range from lows of 1 or 2 percent for cases deemed low risk to over 50 percent for families followed for more than 5 years.[16] However, differences in definitions, types of cases, and lengths of follow-up make comparison of rates somewhat meaningless. The more broadly recurrences are defined, that is, any report versus a substantiated report, the higher will be the rates of recurrence. Similarly, the longer families are followed, the greater the likelihood that child maltreatment will recur. The results of the four recurrence-related survival analysis studies are also difficult to compare, as a result of differences in follow-up intervals, sample sizes, units of analyses, and the specific type of survival analyses procedures. These four studies examined central registry reports in Colorado,[17] a medical center population of children in Chicago,[18] a single sample of children and families that received family-preservation services in Utah,[19] and families that received family-preservation services in a multiple site experiment in Illinois.[20] Follow-up intervals ranged from 1 year following the termination of treatment,[21] approximately 3 years following the assignment to an experimental or comparison group,[22] variable follow-up from 1 month to 4 years following a report to the Colorado Central Registry,[23] and 5 years following treatment at an interdisciplinary child abuse assessment unit.[24] Sample sizes and units of analyses also varied, that is, 51 maltreated children,[25] 1,564 families,[26] 24,507 children,[27] and 304 children.[28] Finally, the specific data analysis procedures also differed between studies: hazard and survival curves were divided into day intervals, mean length of time until recurrence, and ranges of time until recurrence;[29] survival curves were divided into 60-day time intervals;[30] partial life tables were divided into 30-day time intervals;[31] and a life table was divided into 6-month intervals.[32]

There are some similarities among results. For the two larger samples, the risk of recurrence was greatest in the first risk interval (30 days for the Colorado study and 60 days for the Illinois study).[33] For the medical center study, the risk of recurrence was greatest during the fourth 6-month interval (1.5 years to 2 years).[34] For the fourth study, risk of recurrence was spread out over time, rather than indicating any particular time when risk was highest.[35]

For practical reasons it may be unrealistic to think that our intervention system will be able to help families stop all future maltreatment. A variety of family and environmental circumstances may change over time to increase the risk of maltreatment after intervention is terminated. However, one would expect that a goal of intervention would be to decrease the risk of maltreatment during treatment and for a considerable time period (1 to 2 years) after services are no longer being provided. For three of the survival analysis studies, overlapping risk periods with intervention make it difficult to determine differences in the distribu-

tion of recurrences during and following treatment.[36] The current study attempts to overcome some of these limitations by following a sufficient number of families over time and examining differences during and following treatment.

With respect to the frequency of child maltreatment recurrences, a previous review found that few studies have reported on the frequency of recurrences.[37] In two U.S. studies of CPS families the vast majority of recurrence cases had only one recurrence, that is, 67 percent for a national study of demonstration programs[38] and 83 percent for a 10-year follow-up of CPS families in one jurisdiction.[39] In contrast, a hospital-based study in England found that less than half (49%) of cases experienced only one recurrence and that as many as 18 percent had experienced four or more recurrences.[40] The hospital-based study in Chicago found that 59 percent of the 51 families with recurrences had only one recurrence, 33 percent had two recurrences, and 8 percent had three or more recurrences.[41]

Findings from these early studies lead to several interesting questions. Are there differences in the pattern of recurrences during and following CPS intervention? When are families most likely to experience recurrences during and following CPS intervention? Are there differences in the pattern of recurrences between families that are identified for their first substantiated CPS report and families that have experienced multiple incidents of maltreatment? Are there differences in the patterns of recurrence between cases initially identified for neglect versus abuse? When families experience multiple recurrences, do these incidents cluster, or are they spread over time? Answers to these questions could help CPS planners determine periods of time when families may be most at risk for recurrence, whether risk of maltreatment declines with intervention (as one would hope), and whether certain types of cases are more at risk and therefore require more intensive intervention during particularly high-risk periods.

Method

Study Design and Overview

The current work is a nonconcurrent prospective study. The subjects were identified in an earlier research project funded by the National Center on Child Abuse and Neglect.[42] To obtain a complete picture of recurrence patterns, families were followed for 5 years from their first 1988 report (index incident) confirmed by a public child protective (CPS) agency. Recurrence was defined as any confirmed report of physical abuse, sexual abuse, or neglect on any child in the family that occurred at least 1 day following the index incident report date. Duplicate

reports of the same incident were not counted as a recurrence. Data were collected and coded from archival sources.

Sample

Sampling for the current work involved two phases: (1) sampling from the population of substantiated CPS reports in 1988 following a set of inclusion and exclusion criteria, and (2) applying a second set of exclusionary criteria to select a group of CPS families to follow with respect to recurrences.

Phase 1 sampling.—Four inclusion criteria were used for the selection of families for the pool of 1,181 subjects in the original study.[43] First, the case had to involve a confirmed report of physical abuse or neglect of at least one biological child during the 1-year period, January 1, 1988, through December 31, 1988. Families with one or more sexually abused children were eligible to be included in the pool only if a child also met study criteria for physical abuse or neglect in 1988 or before. It was assumed that sexual abuse cases alone might look different than those that also involved physical abuse or neglect. Second, the confirmed maltreatment characteristics needed to be consistent with the study's operational definition of either physical abuse or neglect. Cases where adequate documentation did not exist to classify a report according to the study definition were excluded. This meant that some cases were excluded that were confirmed by a caseworker because of a risk of maltreatment, but the researcher was unable to classify by type and/or severity of abuse or neglect, either because the case specifics were vague or because the caseworker did not adequately document the case circumstances. Third, the family needed to reside within the city limits of Baltimore, Maryland, at the time of the maltreatment incident. Fourth, the maltreated child's biological mother had to hold primary or shared caregiver responsibility when the confirmed incident occurred. After applying the above criteria, 1,181 families were selected from the population of 8,620 (2,902 confirmed) reports of maltreatment made to the agency during 1988.

The original plan to select these families was to read records of all 2,902 families with confirmed reports and to select all who met the study criteria. However, problems in locating all records and the length of time to read all records required the selection of a sample of the confirmed reports. Confirmed reports were stratified by month (to address seasonal differences) and further stratified by whether continuing services were provided, resulting in a sampling frame of 1,583 (54.5% of the original group of unduplicated confirmed reports). From the sampling frame, 628 families had been closed in intake and 955 families had been referred for continuing services. The majority of the screened-out families (because they did not meet the eligibility criteria) involved cases that were closed. Of these, 383 families out of 628 families met study criteria,

and 798 of the 955 families who were referred for continuing services met the eligibility criteria. In general, intake cases were screened out because of insufficient information to classify a case by type or severity. Continuing cases were most often screened out because they did not meet other study criteria, for example, residence with the biological mother in Baltimore.

Phase 2 sampling.—At the beginning of the recurrence study a cohort of 1,181 CPS families was available for follow-up. Three exclusion criteria were applied to this cohort, all based on whether the mother and children had resided together during the 5-year follow-up interval (1988–93). The family was excluded from the recurrence study if members did not reside with each other during at least a portion of the risk period because of one or more of the following reasons: (1) all children in the family had been placed in out-of-home placement within 90 days of the index incident and remained in foster, kinship, or adoptive care for the complete study period (11 families were excluded for this reason); (2) all children were 18 years of age or older or no longer living within 90 days of the index incident (one family was excluded for this reason); (3) the family was known to have moved out of the state of Maryland and remained out during the complete risk period (two families were excluded for this reason). After applying the above exclusion criteria, 1,167 families were available for analysis. Finally, 497 of the 1,167 families were used in analyses of frequency of recurrences, as the other 670 families had not had a recurrence.

Data Collection Sources

Selected data elements were coded on all 1,167 families from the statewide Automated Master File Information System (AMF). The statewide AMF system permits a determination of whether the family was reported and confirmed for maltreatment in any of Maryland's 24 local CPS programs. A detailed coding schedule and manual were developed to facilitate coding and data entry on all relevant variables available from the AMF system. Validation of all system variables against the case record was explored for a sample of cases, and no inconsistencies were found with respect to the timing of service data. When data in the system were missing or contradictory with respect to the substantiation of a report, the case record was used as a more valid record since detailed explanations of the investigation of the report were available in the record. Data were coded with respect to the following: child maltreatment reports, types and substantiation status, and opening and closing dates of child protective services' intake and continuing services.

A detailed case record abstraction coding manual was developed. It specified methods for operationalizing each variable, transferring data from printouts, and indicating under what circumstances verification of

data was needed from case records. Each case was coded by one person and then edited by a second person. Staff was trained to 95 percent interrater reliability before they were permitted to edit another person's cases. A research supervisor resolved discrepancies between coders.

Data Analysis

Data were analyzed with multiple methods: (1) life tables were constructed to examine the pattern of recurrences, and (2) frequencies and *t*-tests were used to examine the pattern of multiple recurrences.

Data Analysis—Pattern of Recurrences

To examine the pattern of recurrences over time, the 5-year period following the index incident was divided into time intervals (e.g., 60 intervals of 30 days each). Survival, probability density, and hazard functions were calculated over different time intervals: (1) for the full, 5-year period, (2) for the length of CPS intervention, and (3) for 2 years following CPS closure. The survival curves identify the amount of time the median family goes without having a first recurrence. Thus, it divides the number of families that had not had recurrences by each time interval. The probability density curves identify the proportion of all families that have a recurrence during a particular time interval; as a result, they identify the period(s) with the highest frequency of recurrences. The hazard function gives the probability of recurrence during the time interval, assuming that the family has survived without a recurrence at the beginning of the interval. The hazard curves identify the proportion of all families who survived without a recurrence at one point in time who had a recurrence in each successive time interval. This plot identifies whether the hazard rate is increasing, decreasing, or remaining the same over time. Since the three functions are mathematically equivalent, it is only necessary to examine one to determine if the pattern between groups differs. "Survival function" is used for the comparisons in this study.

The life-table method has been described as one of the oldest techniques for measuring mortality and describing the survival experience of a population.[44] For this study life tables were used to describe the time until the first recurrence following the index incident, the time until the first recurrence during CPS intervention, and the time until the first recurrence following CPS intervention.[45]

Estimates from the individual intervals were combined to estimate cumulative probabilities. Censored families for whom recurrence did not occur during a time period contributed information to all intervals during which they are observed.[46] To compare the survival experiences between groups for the second two time periods, that is, while CPS services were provided and following the closure of CPS services, the SPSS Life

Tables procedures, which uses the Wilcoxon (Gehan) statistic, was run.[47] This procedure displays the number of censored (nonrecurrence) and uncensored (recurrence) cases as well as an average score for each group. The average score is calculated by comparing each case to all others and incrementing the score for a case by one point if the case has a longer survival time than another case and decrementing it by one point if the case has a shorter survival time. To determine if groups differed, the survival functions were compared with an appropriate inferential test, that is, the Wilcoxon (Gehan) statistic. This test is based on computing the weighted difference between the observed and expected number of recurrences at each of the time points.[48]

Data Analysis—Frequency of Recurrences

To address this objective, a basic descriptive analysis was implemented. There were five steps to this analysis: (1) production of frequencies and a histogram for the number of recurrences within 5 years; (2) comparison of the mean time until each recurrence between groups in families with one recurrence, two recurrences, up to seven recurrences; (3) comparing the mean time until recurrence between groups (single versus multiple recurrence families); (4) comparing the mean time until recurrence between groups in 6-month intervals; and (5) comparing the mean time until each recurrence to a "standard time" for each recurrence group (families with two, three, four, five, six, and seven recurrences). The standard time for each recurrence group was computed by dividing the risk period (5 years) by the number of recurrences. Thus, if recurrences were spread out over the 5 years, the time until each recurrence would also be spread out. For example, the standard time until each recurrence for families with five recurrences would be 365 days (one per year of observation).

Findings

Descriptive results suggest that 43 percent of families experienced at least one recurrence during the 5-year follow-up. Most recurrences were classified as neglect (64%); 27.4 percent were classified as physical abuse, and 8.7 percent were classified as sexual abuse. Among the 497 families who experienced a recurrence most experienced only one (52.1%), 24.9 percent experienced two recurrences, 11.9 percent experienced three recurrences, 7 percent experienced four recurrences, and 4.2 percent experienced five or more recurrences.

Findings—Patterns of Recurrences

Analyses to address patterns were conducted with the 1,167 study families defined above. These analyses were geared to identifying time inter-

vals that had high child maltreatment recurrence rates among the families (*a*) during 5 years following an index-substantiated incident, (*b*) from the time of the index incident to the termination of the CPS intervention, and (*c*) for 2 years following the termination of services. The 5-year period was used primarily to describe the pattern over a 5-year follow-up for the complete sample, regardless of treatment status. The second two intervals were arrived at so that results would be most useful to CPS agencies, since the time periods are consistent with key stages of the CPS case process.

Pattern of recurrences over five years.—For the 5-year risk period the hazard rate (probability of recurrence) was greatest during the first 30 days following acceptance of the CPS report. Table 1 depicts the number of families followed in the study (number exposed to risk who had not yet experienced a first recurrence by that interval), the number of families who experienced a recurrence during that interval (the number of terminal events), the proportion of families with a recurrence during that interval (proportion terminating), the cumulative proportion of families who had not experienced a recurrence by that interval (cumulative pro-

Table 1

LIFE TABLE FOR TIME UNTIL FIRST RECURRENCE OVER FIVE YEARS

Interval Start Time	Number Exposed to Risk	Number of Terminal Events	Proportion Terminating (%)	Cumulative Proportion Surviving at End (%)	Hazard Rate	SE of Hazard Rate
.0	1,167.0	72.0	6.17	93.83	.0617	.006
30.0	1,095.0	35.0	3.20	90.83	.0320	.006
60.0	1,060.0	29.0	2.74	88.35	.0274	.006
90.0	1,031.0	20.0	1.94	86.63	.0194	.003
120.0	1,011.0	26.0	2.57	84.40	.0257	.006
150.0	985.0	19.0	1.93	82.78	.0193	.003
180.0	966.0	20.0	2.07	81.06	.0207	.006
210.0	946.0	9.0	.95	80.29	.0095	.003
240.0	937.0	13.0	1.39	79.18	.0139	.003
270.0	924.0	13.0	1.41	78.06	.0141	.003
300.0	911.0	8.0	.88	77.38	.0088	.003
330.0	903.0	8.0	.89	76.69	.0089	.003
360.0	895.0	5.0	.56	76.26	.0056	.003
390.0	890.0	3.0	.34	76.01	.0034	.003
. . .	. . .	. . .	. . .	. . .	. . .	. . .
750.0	812.0		.49	69.24	.0049	.003
. . .	. . .	. . .	. . .	. . .	. . .	. . .
1,110.0	758.0		.53	64.61	.0053	.003
. . .	. . .	. . .	. . .	. . .	. . .	. . .
1,470.0	705.0		.71	59.98	.0071	.003
. . .	. . .	. . .	. . .	. . .	. . .	. . .
1,800.0	671.0		.30	57.33	.0030	.003

NOTE.—Survival variable: TIMETIL1 TIME to first recurrence. A row of ellipses indicates an omitted line or lines of the table.

portion surviving), the relative risk of recurrence during that interval for families who had not yet experienced a recurrence (hazard rate), and the standard error for the hazard rate for that interval. Results suggest that the hazard rate (probability of recurrence) was highest (.0617) during the first 30 days following the index incident and steadily declined during the first year. By 270 days, 50 percent of recurrence families experienced their first recurrence. After about a year (360 days) the hazard rate leveled off and remained relatively constant, fluctuating between .0071 and .0030. Table 1 presents the Life Table divided into 30-day time periods over the 5 years.[49]

Pattern of recurrences while services are provided.—In contrast to the 42.6 percent of families who had a recurrence during the full, 5-year risk period, only 26.8 percent of them experienced a recurrence while either CPS intake or ongoing services were provided. Of course the beginning of the 5-year period overlapped with the active service period, and for this reason the hazard rates for the first four 30-day intervals are identical. However, among families still receiving services, the leveling-off time came somewhat sooner. Whereas the hazard rate leveled off for the earlier sample at about 360 days, it began to level off at about 210 days among families still receiving services. From this point forward the hazard rate ranged from .01 to .00.

Pattern of recurrences following CPS closure.—Among the primary purposes of CPS intervention is to reduce the likelihood of child maltreatment recurrences. Thus, one measure of treatment effectiveness is the degree to which families that received CPS intervention stopped their maltreatment. This analysis examined the time until recurrence by setting a 2-year follow-up beyond the CPS closing date. The date, of course varied with the length of services.

Eighty-five percent of families did not have a known recurrence of child maltreatment within 2 years of CPS closure. Yet, the hazard rate did not appear to decline dramatically over time. Instead, it started low .0074 and stayed relatively constant over the 2 years, ranging up to .01 for only one interval and down to .002 and .00 for other intervals. In practical terms this suggests that the likelihood of recurrences was not greater or higher at any particular interval following closure of CPS services, although the low rate precludes definitive conclusions.

Differences in pattern of recurrences between families with different service status.—Among the 1,167 families that received an index-substantiated report of abuse or neglect, 331 (28.4%) were closed in intake and 836 (71.6%) received continuing protective services.[50] Of the 836 families who received continuing protective services, 108 (13%) were already actively receiving protective services because of at least one prior substantiated report of child maltreatment.

It was expected that there would be differences in the survival experience among these three groups of families, by which families who only

received intake services, theoretically because the risk of maltreatment was low, would have a lower hazard rate. It also was expected that families that were already active in CPS continuing services and that had at least one confirmed prior report of maltreatment would have a higher hazard rate of recurrence. For these reasons the survival experience among these three groups was compared.

Separate life tables were constructed for each group, and the survival functions for the three groups were plotted in figure 1. Table 2 presents the comparison of survival experience using the Wilcoxon (Gehan) statistic, which suggests that a statistically significant difference exists between the groups (Wilcoxon = 77.196; df = 2; $p < .001$). Therefore, the null hypothesis of no difference in survival experience among these three groups is rejected.

Information from the life table (not provided) indicates that the hazard rates for intake closed cases are lowest (range from .03 during the first 30-day interval to .009 by the 90-day interval by which time all but two cases were closed) and by the time the last case was closed, 92 percent had survived without a recurrence. Also, as expected, for families who were active at the time the index report was received the hazard rate was the highest (ranged from .08 during the first 30 days to .01 by 720 days). By the time the last family in this group was closed (720 days following the index), only 60 percent had survived without a recurrence.

For families whose cases were opened following their index report the

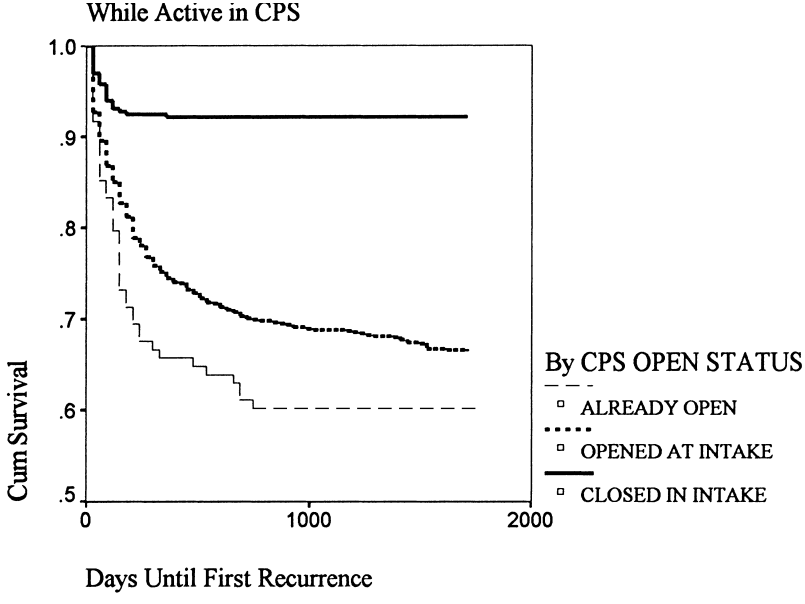

FIG. 1

Table 2

COMPARISON OF SURVIVAL EXPERIENCE WHILE CASE ACTIVE IN CPS BY CPS OPEN STATUS

CPS Open Status	Total Number	Recurrences (Uncensored)	No Recurrence (Censored)	Percent No Recurrence (Censored)	Mean Score
Closed in intake	331	26	305	92.15	211.25
Opened in intake	728	244	484	66.48	−72.42
Already open	108	43	65	60.19	−159.29

NOTE.—Overall comparison statistic Wilcoxon (Gehan) = 77.196; df = 2; $p < .001$; $N = 1{,}167$.

survival experience was in the middle of these other two groups (hazard rate ranged from .07 during the first 30 days to .002 by 720 days). Sixty-six percent survived without a recurrence by the time the last family case was closed (1,680 days following the index report). Further analysis indicated that while there was a statistically significant difference in the survival function between cases closed in intake and those provided continuing services, there was no statistically significant difference between the two continuing services groups (already active versus opened at index).

Because one of the primary purposes of CPS intervention is to reduce the likelihood of child maltreatment recurrences, one measure of treatment effectiveness is the degree to which families who have received CPS intervention have stopped their maltreatment. Given the three different classifications of CPS open status, that is, closed in intake, opened for continuing services at intake, or already open in CPS, it is important to examine whether there are any differences in the survival experience between these groups after services were terminated. Figure 2 depicts the survival experience for all three groups, which are similar to the results in figure 1. The positions of the groups are the same, and there still are statistically significant differences between the groups. The graphic depiction in figure 2 suggests more of a similarity between the closed in intake group and the opened at intake than was apparent for the earlier analysis, however (see fig. 1).

The test comparing the groups (see table 3) suggests that the null hypothesis of no difference in survival experience between the groups is rejected. Taken together, there is a statistically significant difference between the three groups (Wilcoxon = 32.762; df = 2; $p = .0000$). For example, the life tables (not provided) indicated hazard rates for the closed in intake group ranged from .003 to .009 for each 30-day interval and did not decline with time. The opened at intake group had hazard rates ranging from .003 to .01. The pattern of survival for the already open group was considerably less uniform than with the other groups.

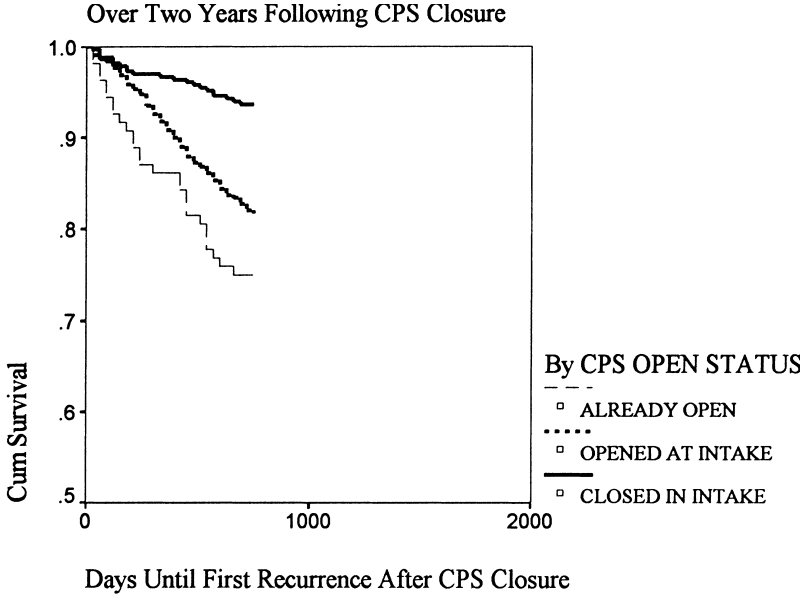

FIG. 2

Table 3

COMPARISON OF SURVIVAL EXPERIENCE FOLLOWING CPS CLOSURE BY CPS OPEN STATUS

CPS Open Status	Total Number	Uncensored	Censored	Percent Censored	Mean Score
Closed in intake	331	21	310	93.66	106.03
Opened in intake	728	133	595	81.73	−30.73
Already open	108	27	81	75.00	−117.01

NOTE.—Overall comparison statistic Wilcoxon (Gehan) = 32.762; df = 2; p = .0000; N = 1,167.

The hazard rate ranged from .01 to .0345 throughout the period, but it did not start high and decline with time. The hazard rate started in the middle of this range (.0185) and peaked and dipped throughout the risk period. The highest hazard rate (.0345) was during the 480-to-510-day interval following closure, however, there were other high hazard rates as well. It is uncertain whether these apparent differences are accurate reflections or attributable to the relatively small number of cases in which recurrence following closure was known.

Differences in survival experience between abuse and neglect index incidents.—The life tables for abuse-only cases and neglect-only cases suggested that neglect cases consistently have higher hazard rates during all three inter-

vals: throughout the 5 years, while active, and following closure. Tables 4, 5, and 6 reveal that these differences are statistically significant. Thus, the null hypotheses of no difference in the survival experience between the groups is rejected for all three time intervals. For the purpose of these analyses, families with multiple types of child maltreatment were excluded, leaving 1,069 families.

In both abuse and neglect cases, the hazard of having a recurrence declines with time. This leveling off occurs earlier for abuse-only cases

Table 4

Comparison of Survival Experience (No Recurrences) over Five Years by Index Maltreatment Type

Maltreatment Type	Total Number	Recurrences (Uncensored)	No Recurrence (Censored)	Percent No Recurrence (Censored)	Mean Score
Physical abuse	408	140	268	65.69	123.61
Neglect	689	339	350	50.80	−73.20

Note.—Overall comparison statistic Wilcoxon (Gehan) = 30.102; df = 1; $p < .001$; $N = 1{,}097$.

Table 5

Comparison of Survival Experience (No Recurrences) While CPS Was Active by Index Maltreatment Type

Maltreatment Type	Total Number	Recurrences (Uncensored)	No Recurrence (Censored)	Percent No Recurrence (Censored)	Mean Score
Physical abuse	408	72	336	82.35	106.60
Neglect	689	224	465	67.49	−63.12

Note.—Overall comparison statistic Wilcoxon (Gehan) = 30.104; df = 1; $p < .001$; $N = 1{,}097$.

Table 6

Comparison of Survival Experience (No Recurrences) Following CPS Closure by Index Maltreatment Type

Maltreatment Type	Total Number	Recurrences (Uncensored)	No Recurrence (Censored)	Percent No Recurrence (Censored)	Mean Score
Physical abuse	408	51	357	87.50	40.56
Neglect	689	128	561	81.42	−24.02

Note.—Overall comparison statistic Wilcoxon (Gehan) = 6.428; df = 1; $p < .001$; $N = 1{,}097$.

than neglect cases. By the end of the 5-year period 66 percent of the abuse cases had survived without a recurrence compared to only 50 percent of the neglect cases.

Whereas in the 5-year survival distribution neglect families were more likely to have recurrences sooner than abuse families, while the case is active there is only a slight trend toward earlier recurrence by neglect families. Fifty percent of the physical abuse recurrence families experienced their first recurrence within 120 days following the index report. This compared to 90 days for the neglect recurrence families. This 30-day difference held true when comparing the point at which 66 percent of families had their recurrences (210 days for the abuse group and 180 days for the neglect group). Because so many other events may occur, it is not as clear that original reports should affect recurrences after the case was closed. Indeed, as table 6 suggests, the difference between families charged with abuse and neglect is not great at this point. There does not appear to be a difference between the groups, but the hazard rate for neglectful families is slightly higher throughout the 2-year interval.

Findings—Frequency of Recurrences

Looking at all 497 families in the full cohort of 1,167 who experienced at least one recurrence over the 5 years, most recurrence families had only one recurrence (52.1%), 24.9 percent had two recurrences, 11.9 percent had three recurrences, and the remaining 11.1 percent had four or more recurrences (see fig. 3). Four separate analyses suggested that when families experienced multiple recurrences, the time between them continually decreased. This suggested a clustering effect for families that experienced multiple recurrences, although it can reflect, in part, that the sample does not include data on recurrences occurring after 5 years. Figure 4 illustrates this pattern.

The mean time until first recurrence was longest for families with only one recurrence, and it was progressively shorter for families with each additional recurrence. Differences between these times were statistically significant between families with one recurrence and families with three recurrences ($t = 2.90$, df = 111.96, 2-*t*, $p = .004$), between families with one recurrence and families with four recurrences ($t = 3.19$, df = 57.77, 2-*t*, $p = .002$), and between families with one recurrence and families with five recurrences ($t = 6.89$, df = 24.30, 2-*t*, $p < .001$).

The mean time until each recurrence also was compared to a "standard" time that was computed based on the number of recurrences that could have occurred over the 5-year interval. For example, for families with five recurrences the standard time until each recurrence would be 365 days if all five recurrences were spread out over the complete 5 years. To determine if clustering occurred, the "standard" time for each recurrence group was compared to the actual mean time until each

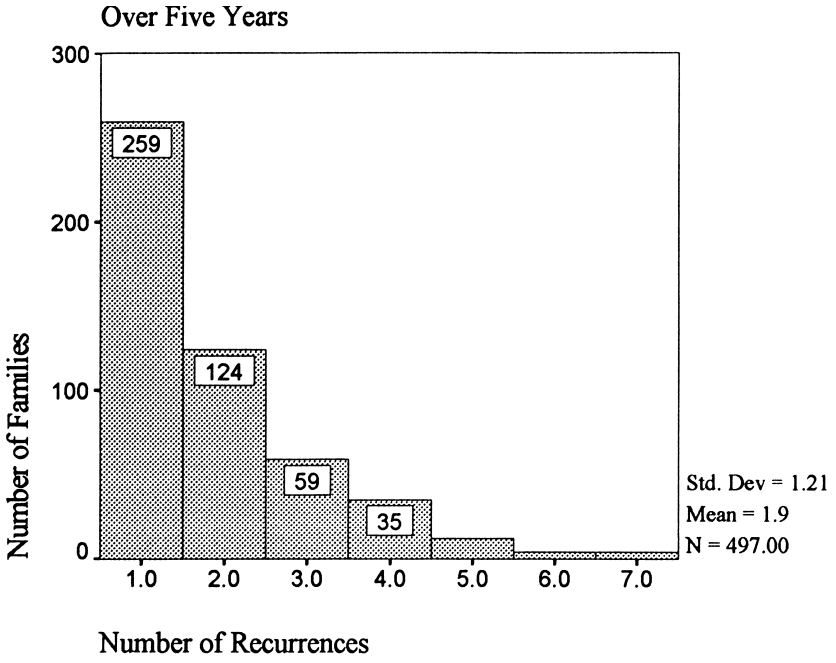
Over Five Years
300
200
100
0
Number of Families
259
124
59
35
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Std. Dev = 1.21
Mean = 1.9
N = 497.00
Number of Recurrences

FIG. 3

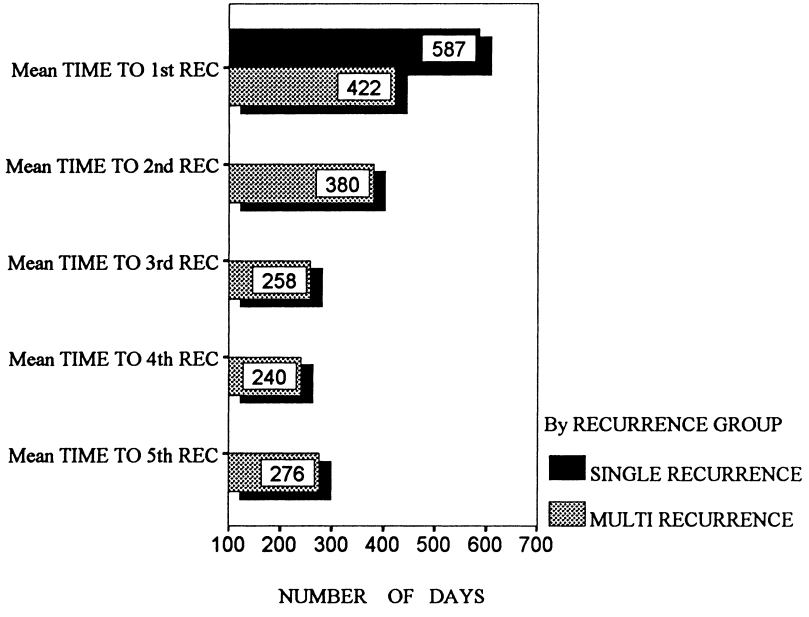
Mean TIME TO 1st REC
587
422
Mean TIME TO 2nd REC
380
Mean TIME TO 3rd REC
258
Mean TIME TO 4th REC
240
Mean TIME TO 5th REC
276
100 200 300 400 500 600 700
NUMBER OF DAYS
By RECURRENCE GROUP
SINGLE RECURRENCE
MULTI RECURRENCE

FIG. 4

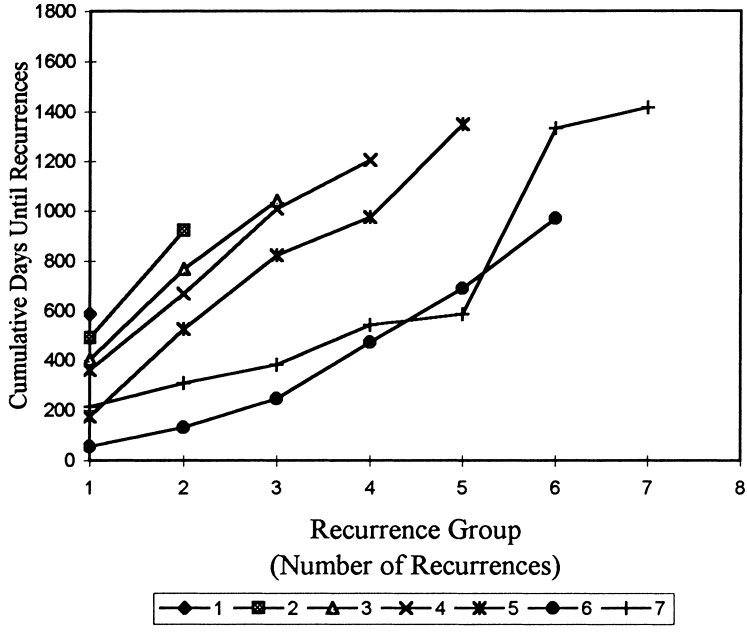

FIG. 5

recurrence occurred for each group, using a Two-Sample Test of Means for Independent Samples. There was a statistically significant difference between the standard time and the mean time until each recurrence for all groups except for families with five recurrences. Figure 5 illustrates that recurrences tend to cluster to the first half of the risk period rather than to extend to the complete risk period.

Discussion

The first important finding of this study was that over 5 years the rate of recurrence was 42.6 percent; while CPS was active, the rate of recurrence was 26.5 percent; and following CPS closure, the rate of recurrence was only 15.5 percent. Without separating the intervals by periods of service, one could conclude that CPS intervention must be ineffective if, after 5 years, 42.6 percent of families experienced a recurrence. However, when carefully examining the pattern of recurrences while CPS was active, the risk of recurrence declined throughout the service period. The pattern also suggested that the likelihood of recurrence after 6 months was significantly reduced (66% of recurrence families experienced their first recurrence within the first 180 days). This conclusion is supported by the fact that after 180 days the hazard rate ranged from .0141 to .0030 compared to .0617 during the first 30 days of services.

The declining hazard rate of recurrence was consistent with the life table analysis on Colorado Central Registry data[51] but not consistent with the life table analysis of a medical clinic population.[52] Possible interpretations of these results suggest that a combination of factors may explain a declining risk of recurrence over time; in particular, control brought on by CPS intervention and/or actual changes in client behavior or conditions due to other factors in the lives of families. This has significant positive implications for the CPS system, since it is largely portrayed as an overburdened system that may be ineffective in meeting the needs of maltreating families.

An important rival explanation may be related to the differences in the surveillance of families over time. Following an initial report to CPS, new incidents of maltreatment may be more likely to be detected by neighbors, friends, professionals, or the CPS worker. Over the course of intervention there may be less surveillance of families by CPS workers and others; therefore, new incidents of maltreatment may be less likely to be detected. Following the closure of CPS, persons may be less likely to report new incidents if they believe nothing was done by the system before. Future research that specifically examines the timing of casework contacts over time could help increase the interpretation of these findings, at least with respect to the declining hazard rate during intervention.

A second important finding was that the highest risk period was within the first 30 days following the CPS index report. Consistent with findings in two other studies, this finding could be partially an artifact of case finding combined with the definition of recurrence for this study.[53] In the course of the CPS initial assessment related to the index report, a worker actually may find evidence of other forms of maltreatment. If the worker does find evidence, a second report is filed, usually within a short interval of the initial report. In this study a second report was termed a "recurrence" if the report was made at least 24 hours following the index report and if it was not alleging the same maltreatment as originally alleged at the time of index. Therefore, at least a portion of this high rate may be explained by the detection of other maltreatment during the initial assessment.

Another explanation could be that when problems reach the level where maltreatment is observed by others who then report them to CPS, the problems do not immediately go away, and the family may be more likely to be reported a second time by others with whom the family comes in contact. The fact that the hazard rate drops by almost 50 percent within the first 30 days (from .0617 to .0320) further suggests that the intervention of CPS may be controlling future maltreatment within a 30-day time period. It is usually within this time period that the initial assessment worker determines whether maltreatment occurred, assesses the risk of future maltreatment, develops a safety plan (if needed), and

determines whether CPS continuing services are needed. These explanations are just possible explanations. Analysis would be difficult since there are not enough families with recurrences within 30 days (only 72 of 1,167) to be able to identify correlates of maltreatment recurrence within a 30-day interval. Future research that identifies specific family and situational characteristics related to recurrence in the short term would have immediate implications for the safety evaluation models increasingly used by CPS agencies.

A third finding was that families who were closed at intake had fewer reported recurrences. For the 331 families closed at intake after their index reports were confirmed, 94 percent of them survived without a recurrence for 2 years following the closure of their cases. Since this rate was significantly lower than the rate for families that had been provided continuing services (both of which should have been affected equally by the lack of surveillance following closure), this could indicate that CPS workers are accurate in their initial risk assessments. These results are consistent with those of a Washington state study that conducted a follow-up of low risk CPS cases.[54] Future research is indicated to examine the characteristics of families that may have led to the decision to close their cases at intake and to separate families whose cases may have been closed in CPS intake because all children were placed versus families whose cases were closed due to assessed low risk.

A fourth finding contributes to knowledge building but also has implications for policy and practice. Results indicate that neglect may be a more chronic form of maltreatment than is physical abuse. Over all three time periods the time until first recurrence was significantly shorter for families confirmed for neglect (only) than for families confirmed for abuse (only) at their index report. This was even true for the survival experience following CPS closure. Looking carefully at the time while CPS was active, neglect families had hazard rates ranging from .0769 to .0179 during the first 6 months of services, whereas abusive families had hazard rates that were considerably lower, ranging from .0319 to .0108. This suggests that the initial CPS service period is very important, particularly for neglect families.

In the prior research that compared recurrence rates between abuse and neglect cases, five studies reported neglect recurrence rates as the highest, two reported physical abuse recurrence rates as the highest, and one reported sexual abuse recurrence rates as the highest.[55] Unfortunately, in many CPS agencies neglectful families are given less of a priority than are physically abusive or sexually abusive families, even though their risk of recurrence may be particularly high. In fact, Maryland policy supports this emphasis. Whereas CPS workers must begin their investigations for all reports of physical abuse or sexual abuse within 24 hours, they only are required to begin investigations of neglect reports within 5 days. CPS policy makers should consider findings such as the ones sug-

gested by this research to reevaluate both formal and informal policies that suggest neglect cases be given less priority than abuse cases. Future research that examines differences in neglect versus abuse cases and uses the family as the unit of analysis should control for the number of children, since families that experience more neglect are more likely to be larger and, thus, have an increased likelihood to experience recurrences.

The findings of this study further indicate that the time until recurrences decreases as the number of recurrences increases. This suggests that there may be something different about multiple-recurrence families versus single-recurrence families. Further research is needed to explain what accounts for multiple recurrences and to determine if different factors predict the second or third recurrences versus the first recurrence.

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37. DePanfilis and Zuravin (n. 5 above).
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50. Maryland policy dictates that within 30 to 60 days, caseworkers must arrive at a finding of abuse or neglect and determine whether the family needs continuing protective services to prevent the likelihood of future maltreatment. Therefore, most families who are closed in intake are only provided services for 60 days. Families who are provided continuing services are provided services until the caseworker believes there is no longer a risk of maltreatment.
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