



COLORADO

Office of Children,
Youth & Families

Department of Human Services

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Handout: DCW AI#3 (Slides #22-27)

Provide a predictive analytic assessment for Legally Freed Children in DCW.

SUMMARY

Research Question: *What factors affect the likelihood of a legally free child or youth achieving permanency?*

To better understand the factors affecting whether legally free children and youth will achieve permanency, DCW's Research and Analysis, Permanency, and Youth Services teams utilized a combination of predictive analytics and research on best practices for achieving permanency. This study examined the permanency outcomes of 5,773 legally free children and youth in Colorado between 2008 and 2014. Overall, the vast majority of Colorado's legally free children and youth achieved a positive permanency outcome, with 88.4% of the population achieving permanency. However, the results demonstrate that children and youth in different age groups are affected by different factors, with children who became legally free between birth and the age of 5 experiencing a different set of factors than children who became legally free between the ages of 6 and 12, and youth who became legally free between the ages of 13 and 17. In addition to identifying the unique factors affecting permanency for children and youth within each of the three age groups, this study also identifies a collection of factors affecting permanency across all age groups. Across all ages, race, number of prior involvements, permanency goal, age, number of placements while in care, and the time spent in congregate care or family-like settings were found to have statistically significant effects on the likelihood of achieving permanency.

METHODOLOGY

Data for this study was collected from Trails in September of 2014. The sample for the study consisted of all children and youth who were legally free between the periods of January 1, 2008 and August 31, 2014¹. For the purposes of this study, legally freed children and youth were defined as any child or youth that was legally free for adoption as the result of both of the child or youth's parents having their parental rights legally terminated. The total sample size for the study was 5,773 children and youth. Legally free children and youth within the sample were divided into three age categories, based upon the age that the child or youth became legally free: birth through five years old ('<1-5'), six through 12 years of age ('6-12'), and 13 through 17 years of age ('13-17'). This study utilized survival analysis (also known as Time-to-Event analysis) in the form of a collection of stratified Cox regression models to examine the factors affecting the likelihood of whether legally free children and youth achieved permanency.

¹ Children and youth within the sample became legally free at any point between January 2008 and August 2014 and could have entered or exited the sample at any time between those dates.

Based upon the professional opinions of the Division of Child Welfare’s Permanency, Youth Services, and Research and Analysis teams², a collection of explanatory variables that could affect the likelihood of achieving permanency were identified. Table 1 provides an overview of the outcome and explanatory variables used within this study.

Table 1: Outcome and Explanatory Variables Related to Achieving Permanency

Variable Name	Variable Definition
<i>Outcome Variables</i>	
<i>Permanency Achieved</i>	Whether a child was adopted or placed for adoption, had a guardianship, was living with another relative, or was reunited with their parents
<i>Legally Free Length of Stay</i>	# of months that a child was legally free until they achieved a permanent outcome or emancipated from the child welfare system
<i>Explanatory Variables (Factors that Could Affect Permanency)</i>	
<i>Race</i>	Caucasian, Hispanic, African American, Other Races
<i>Gender</i>	Male or Female
<i>Physical Disability</i>	Formally diagnosed with a physical disability
<i>Mental Disability</i>	Formally diagnosed with a mental disability
<i>Number of Involvements before Removal</i>	# of involvements with the system prior to becoming legally free
<i>Age at TPR</i>	Age at the time of termination of parental rights (TPR)
<i>Permanency Goal</i>	The most recent permanency goal
<i>Number of Placements</i>	Number of placements while legally free
<i>Months in Congregate Care</i>	# of months in a congregate care setting
<i>Months in Family-Like Setting</i>	# of months in a foster care placement or residing with kin

RESULTS

The results of the study are presented in two parts. The first part (Table 2 & Figure 1) presents an overview of the descriptive statistics for each of the three age groups. The second part (Table 4 and the accompanying factors described on pages 6-7) presents an explanatory analysis comprised of a collection of Cox regression models measuring the factors affecting permanency for each age group.

Table 2 presents the descriptive characteristics for legally freed children and youth across the three age groups. Collectively, the descriptive results shown in Table 1 provide a detailed understanding of Colorado’s legally free population. These figures point to the distinct differences between the three age groups, with children in the <1-5 group possessing characteristics that are unique when compared to children in the 6-12 and 13-17 age groups.

² Casey Family Program’s research staff, including Kirk O’Brien, Crystal Ward Allen, and Kristen Rudlang-Perman, also provided extensive input into the development of the operational measures.

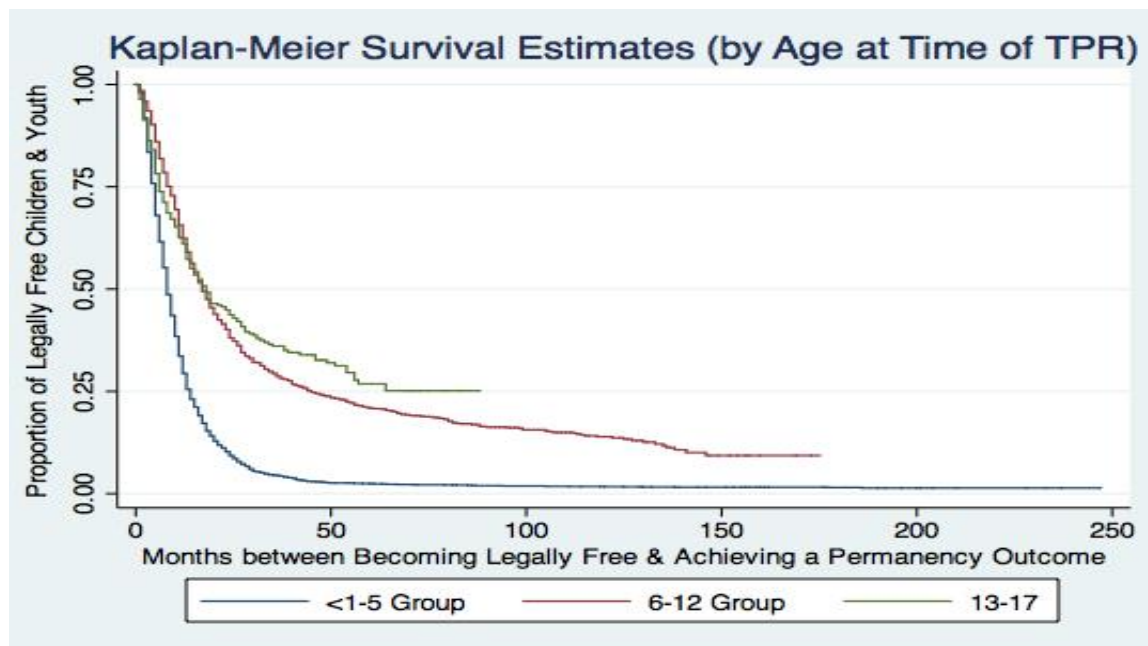
Table 2: Demographics of Legally Free Children (January 2008 – August 2014)

Variable	<1-5 Years	6 -12 Years	13-17 Years	All Ages
# of Legally Free Children	3,839 (66.5%)	1,655 (28.7%)	279 (4.8%)	5,773
<u>Permanency Outcome (by Type)</u>				
<i>Adoption</i>	3,552 (92.5%)	1,256 (75.9%)	173 (62.0%)	4,981 (86.3%)
<i>Living With Other Relatives</i>	36 (0.9%)	34 (2.1%)	5 (1.8%)	75 (1.3%)
<i>Reunification</i>	2 (0.1%)	10 (0.6%)	5 (1.8%)	17 (0.3%)
<i>Guardianship</i>	10 (0.3%)	14 (0.9%)	2 (0.7%)	26 (0.5%)
<i>Emancipated</i>	21 (0.6%)	118 (7.1%)	58 (20.8%)	197 (3.4%)
<i>Other (Death, Runaway, Failed Adoption)</i>	4 (0.1%)	10 (0.6%)	10 (3.6%)	24 (0.4%)
<i>Censored (Still in Care)</i>	214 (5.6%)	213 (12.9%)	26 (9.3%)	453 (7.8%)
Age at TPR in Years (Mean)	2.0	8.4	14.3	4.4
<u>Race</u>				
<i>Caucasian</i>	1,602 (41.7%)	765 (46.2%)	153 (54.8%)	2,520 (43.7%)
<i>Hispanic</i>	1,498 (39.0%)	626 (37.9%)	89 (31.9%)	2,513 (38.3%)
<i>African American</i>	421 (11.0%)	162 (9.8%)	25 (9.0%)	608 (10.5%)
<i>Other Races</i>	318 (8.3%)	102 (6.2%)	12 (4.3%)	432 (7.5%)
Male	2,052 (53.5%)	850 (51.4%)	124 (44.4%)	3,026 (52.4%)
Siblings in Care	2,189 (57.0%)	1,250 (75.5%)	176 (63.1%)	3,615 (62.6%)
Physical Disability	169 (4.4%)	102 (6.2%)	16 (5.7%)	287 (5.0%)
Mental Disability	75 (2.0%)	144 (8.7%)	26 (9.3%)	245 (4.2%)
<u>Ten-Large Counties</u>				
<i>Adams</i>	536 (14.0%)	236 (14.3%)	28 (10.0%)	800 (13.9%)
<i>Arapahoe</i>	422 (11.0%)	133 (8.0%)	25 (9.0%)	580 (10.1%)
<i>Boulder</i>	141 (3.7%)	49 (3.0%)	11 (3.9%)	201 (3.5%)
<i>Denver</i>	854 (22.3%)	331 (20.0%)	37 (13.3%)	1,222 (21.2%)
<i>El Paso</i>	424 (11.0%)	205 (12.4%)	45 (16.1%)	674 (11.7%)
<i>Jefferson</i>	394 (10.3%)	151 (9.1%)	24 (8.6%)	569 (9.9%)
<i>Larimer</i>	104 (2.7%)	52 (3.1%)	15 (5.4%)	171 (3.0%)
<i>Mesa</i>	182 (4.7%)	106 (6.4%)	26 (9.3%)	314 (5.4%)
<i>Pueblo</i>	176 (4.6%)	56 (3.4%)	9 (3.2%)	241 (4.2%)
<i>Weld</i>	166 (4.3%)	102 (6.2%)	19 (6.8%)	287 (5.0%)
<i>Balance of State Counties</i>	440 (11.5%)	234 (14.1%)	40 (14.3%)	714 (12.4%)
Legally Free Length of Stay in Months (Median)	8.0	15.0	16.0	10.0
Neglect ³	2,326 (60.6%)	766 (46.3%)	85 (30.5%)	3,177 (55.0%)
Abuse ⁴	481 (12.5%)	322 (19.5%)	75 (26.9%)	878 (15.2%)
# of Involvements before Removal (Mean)	0.7	1.6	1.6	1.0
Permanency Goal				
<i>Adoption/Guardianship</i>	3,803 (99.1%)	1,459 (88.2%)	193 (69.2%)	5,455 (94.5%)
<i>OPPLA</i>	36 (0.9%)	196 (11.8%)	86 (30.8%)	318 (5.5%)
# of Placements (Mean)	2.2	4.1	4.4	2.8
Months in Congregate Care (Mean)	0.5	6.7	6.6	2.5
Months in Family-Like Setting (Mean)	24.0	37.6	37.8	28.6

³ Due to difficulties within the Trails system in linking the maltreatment type associated with a referral to a removal, information on maltreatment type (including neglect) was not collected for all children.

⁴ Due to difficulties within the Trails system in linking the maltreatment type associated with a referral to a removal, information on maltreatment type (including abuse) was not collected for all children.

Figure 1 below further highlights the statistically significant differences between the time to achieving permanency among the three age groups ($p<0.001$).



Within the <1-5 group, 50% of legally free children reached a permanency event by the eighth month while 75% reached the permanency event by the 13th month and 90% reached the event by the 22nd month. In contrast, legally free children and youth in the 6-12 and 13-17 age groups were legally free for extended periods of time before reaching the permanency event. Within the 6-12 group, 50% of legally free children reached a permanency event by 15th month while 75% reached the event by the 37th month and 90% reached the event by the 87th month. Within this age group, 50% of youth 13-17 reached a permanency event by the 15th month while 75% reached the event by the 36th month and 90% reached the event by the 57th month.

Table 3: Percentage of Age Group Achieving a Permanency Event (In Months)

% of Age Group	<1-5 Years	6-12 Years	13-17 Years
50%	8	15	15
70%	13	37	36
90%	12	87	57

Table 4 below provides an overview of the Cox Regression models used to determine the factors affecting the likelihood of achieving permanency across all age groups. An interpretation of the findings is provided on the following pages.

Table 4: Cox Regression Models on factors affecting the Likelihood of Achieving Permanency (by Age Group)

	<1-5 Years		6-12 Years		13-17 Years		All Ages	
Variable	Hazard Ratio	Robust Standard Error	Hazard Ratio	Robust Standard Error	Hazard Ratio	Robust Standard Error	Hazard Ratio	Robust Standard Error
Race (<i>Reference Group: Caucasian</i>)								
<i>Hispanic</i>	0.95	0.06	0.86	0.07	1.22	0.29	0.93	0.05
<i>African American</i>	0.77*	0.10	0.64**	0.11	0.40	0.25	0.73**	0.08
<i>Other Races</i>	1.00	0.12	0.72	0.15	0.89	0.69	0.98	0.10
Male	1.00	0.05	0.83**	0.05	1.32	0.29	0.95	0.04
Physical Disability	1.09	0.11	1.05	0.17	0.88	0.40	1.04	0.10
Mental Disability	0.78	0.12	0.90	0.13	0.75	0.58	0.84	0.10
# of Involvements before Removal	0.81***	0.02	0.91***	0.02	0.99	0.08	0.88***	0.02
Permanency Goal								
(<i>Reference Group: Adoption & Guardianship</i>)								
<i>OPPLA</i>	0.04	0.11	0.03***	0.02	0.01***	0.01	0.05***	0.03
Age at TPR	0.98	0.02	0.98	0.02	1.30**	0.11	0.98**	0.01
Number of Placements[^]	1.00	0.01	0.94***	0.01	0.93***	0.01	0.96***	0.01
Months in Congregate Care[^]	0.96***	0.01	0.98***	0.00	1.01	0.01	0.98***	0.00
Months in Family-Like Setting[^]	0.97***	0.00	0.98***	0.00	0.99**	0.00	0.98***	0.00

Statistically significant at the following levels: *(p<0.05), **(p<0.01), ***(p<0.001).

Stratified on County and Siblings in Care to correct for proportionality.

[^] Time-dependent covariate that was interacted with the log of time to correct for proportionality issues.

Factors Affecting Permanency for Children <1-5

Across the 3 age groups, children in the <1-5 group had the highest level of positive permanency outcomes and had comparatively fewer factors affecting these outcomes. The following factors had statistically significant effects on whether a child in the <1-5 group achieved permanency:

- Compared to Caucasian children, African American children were 23%* less likely
- Each additional involvement with the CW system prior to becoming legally free resulted in the child being 19%*** less likely
- Each additional month that a child was placed in a congregate care setting resulted in the child being 4%*** less likely
- Each additional month that a child was placed in a family-like setting resulted in the child being 3%*** less likely

Factors Affecting Permanency for Children 6-12

Across the 3 age groups, children in the 6-12 group experienced a greater number of factors affecting the likelihood of achieving permanency. The following factors had statistically significant effects on whether a child in the 6-12 group achieved permanency:

- Compared to Caucasian children, African American children were 36%** less likely
- Male children were 17%** less likely
- Each additional involvement with the CW system prior to becoming legally free resulted in the child being 9%*** less likely
- Compared to children with a permanency goal of adoption/guardianship, children with a goal of OPPLA were 97%*** less likely
- Each additional placement that a child experienced while in care resulted in them being 6%*** less likely
- Whether a child was placed in a congregate care or family-like setting was found to have similar effects, with each additional month in either setting resulting in the child being 2%*** less likely

Factors Affecting Permanency for Youth 13-17

Across the 3 age groups, youth in the 13-17 group had fewer factors affecting the likelihood of achieving permanency, but also had the lowest level of permanency. The following factors had statistically significant effects on whether a youth in the 13-17 group achieved permanency:

- Compared to youth with a permanency goal of adoption/guardianship, youth with a goal of OPPLA were 99%*** less likely
- Each additional placement that a youth experienced while in care resulted in them being 7%*** less likely
- Each additional month that a youth was placed in a family-like setting resulted in the youth being 1%*** less likely
- Age was found to have a positive effect, with a one year increase in age resulting in a youth being 30%*** more likely
 - The implications of this finding are not immediately clear. The finding could be indicative of DCW's increased focus on achieving permanency for older youth. Or, the finding could be attributed to a reluctance to terminate parental rights for older youth

Note: To maintain brevity, only statistically significant variables are reported here. Variables are statistically significant at the following levels: *(p<0.05), **(p<0.01), ***(p<0.001).

Factors Affecting Permanency across All Ages

While this study's focus is on the distinct factors affecting permanency for each age group, a fourth model (hereafter referred to as 'All Ages') was constructed to examine the factors affecting permanency across all age groups. The following factors had statistically significant effects on whether children or youth in all age groups achieved permanency:

- Compared to Caucasian children, African American children and youth were 27% less likely***
- Each additional involvement with the CW system prior to becoming legally free resulted in the child or youth being 12% less likely***
- Compared to a child or youth with a permanency goal of adoption/guardianship, children and youth with a goal of OPPLA were 95% less likely***
- Across all age groups, a one year increase in the age that a child or youth became legally free resulted in the child or youth being 2% less likely**
- Each additional placement that a child or youth experienced while in care resulted in the child or youth being 4% less likely to achieve permanency ($p < 0.001$)
- Whether a child or youth was placed in a congregate care or family-like setting was found to have similar effects, with each additional month in either setting resulting in the child or youth being 2% less likely***