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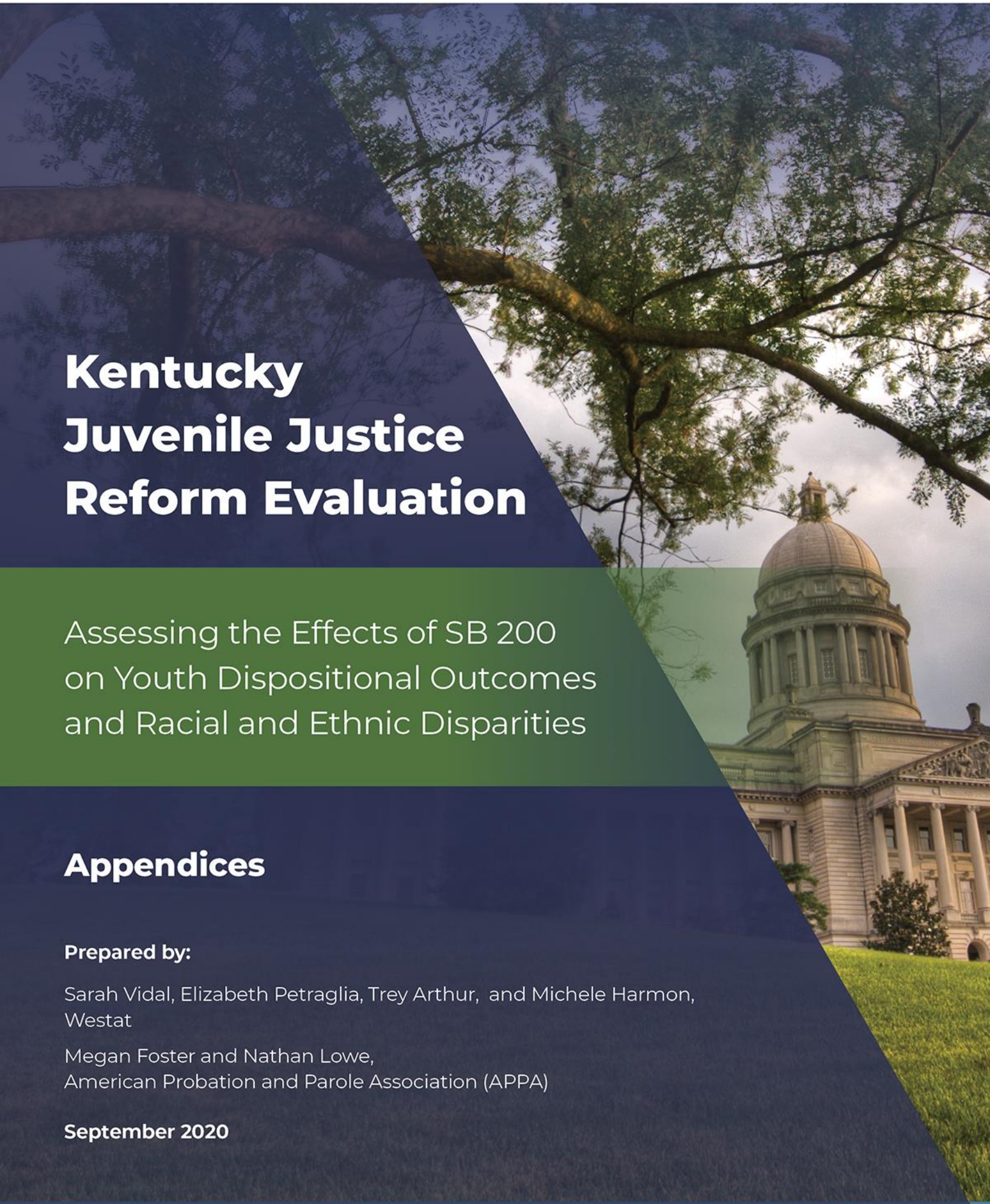

Kentucky Juvenile Justice Reform Evaluation

Assessing the Effects of SB 200 on Youth Dispositional Outcomes and Racial and Ethnic Disparities

Appendices

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Appendices

Appendix A. SB 200 Timeline

Event	Description	Start Date	End Date
Established FAIR Teams (AOC)	The following key events described the establishment of FAIR Teams: • Individual meetings with Juvenile Court Judges (June 2014) • The first Community Partner Meeting occurred in Christian County on July 31, 2014. • The first FAIR Team orientation occurred at Christian County on Sept. 18, 2014. • Nine FAIR Team pilot sites were created (October 2014). • Case hearings began on October 16, 2014.	June 2014	May 2017
Adopted the Juvenile Court Rules of Procedure and Practice (JCRPP)	The JCRPP was reviewed by a newly created Supreme Court Standing Committee on Juvenile Rules and vetted at a public hearing at the Kentucky Bar Association Annual Convention in June 2015. It was adopted and became effective in September 2015. An important component of the JCRPP was to provide training to judges and court staff and offer technical support to attorneys and personnel from juvenile justice agencies to help them transition to the new rules. The following trainings were conducted in support of JCRPP: • Judicial College: JCRPP and Juvenile Forms Training (September 2015) • Training to members of the Bar: Kentucky Bar Association at 9 locations around the state (September – December 2015) • Clerk College: Juvenile Forms Training (September 2015)	October 2014	January 2016

Event	Description	Start Date	End Date
Implementation of FAIR Teams (AOC)	The following key events described the implementation of FAIR Teams: • Community Partner Meetings in each judicial district (October 2014) • FAIR Team Orientation following the community partner meeting in each judicial district (December 2014) • Community Partner Directory, an exhaustive list of community-based services was established for each judicial district (August 1, 2017) • 48 of the 60 judicial districts were staffed by a CDS leading FAIR Teams (June 2015). • FAIR Teams established in all 60 judicial districts (May 2016). • Secure website accessible by FAIR Teams (March 2016). • Training on Principles of Effective Intervention (June-July 2016). • Training on team guidelines, case referral processes, and requisite forms (August 2016) • 114 FAIR Teams have been implemented in each judicial district in Kentucky (May 2017)	October 2014	May 2017
Completed trainings related to CDW role expansion (AOC)	The following trainings supporting the role expansion of CDWs were conducted: • Court Designated Specialist Orientation (November 2014) • Training on GAIN-Q3; Strength-Based Approach; Trauma-Informed Care; Motivational Interviewing Techniques (Dec 2014) • FJS Staff Conference: Building Healthy Families (May 2014) • CDW and CDS Training on Coordinating services between families and Managed Care Organizations and Understanding parameters around special education students and students with disabilities (January 2015) • 12 Regional Programs for CDWs statewide (February 2015) • The Spirit of Diversion (December 2015)	Dec 2014	Sep 2016

Event	Description	Start Date	End Date
	• Regional trainings on Developing Quality Diversions (Mar 2016) • Principles of Effective Intervention (Aug-Sept 2016) • Implicit Bias (Sept 2016) • A Kentucky Response to Addressing Disproportionality and Disparity: An Agency Model (October 2017) • Cultural Collision Training (January 2018)		
Refined Risk and Needs assessment tools (AOC)	AOC started the full rollout plan of refining its risk and needs assessment on March 2015 and completed the inter-rater reliability process for GAIN-SS on March 2016.	Mar 2015	Mar 2016
Implemented graduated responses (incentives/sanctions) (DJJ)	DJJ created graduated response decision-making grid and graduated sanctions grid. Policy revisions and staff training have been completed.	Spring 2015	July 2015
Training of Judges	AOC conducted seven regional sessions to help judges prepare to implement SB200.	May 2015	May 2015
Training of Education Professionals	• Education professionals were trained on the responsibilities school districts must assume under SB200.	May 2015	Jun 2015
Implemented graduated responses and sanctions (AOC)	The following activities occurred in support of implementing graduated responses and sanctions: • Established an internal workgroup to develop, train, and implement a graduated response policy within a diversion program (May 2015). • Developed a Train-the Trainer curriculum (May 2015-April 2016). • Conducted the Graduated Responses Train-the-Trainer Program (April-June 2016). • Trained CDWs on Graduated Responses in Diversion (December 2016). • Finalized the Graduated Responses Policy and Diversion manual chapter (June 2017). Trained CDWs on Graduate Responses Policy (August 2017)	May 2015	Nov 2017

Event	Description	Start Date	End Date
Established AOC and DJJ data sharing web interface (Data and Information Sharing)	AOC and DJJ MOU developed a web interface to permit juvenile records sharing. An initial pilot phase for a website application was conducted in January 2016.	July 2015	Jan 2016
Refined Risk and Needs assessment tools (DJJ)	RCNA was implemented in 2015. Inter-rater exercises are ongoing with planned tool validation in 2018.	November 2015	ongoing
Strategic and Sustainability Plan (AOC/DJJ)	AOC and DJJ completed strategic and sustainability plans with CJI.	Jan 2016	Dec 2017
Closed 3 juvenile justice facilities (DJJ)	Four facilities have closed—Lincoln Village Detention Center, Murray Group Home in Calloway County, Owensboro Treatment Center in Daviess County, and Audubon Residential Center (will be turned into a day program)	Fall 2016	May 2017
Establishment of the preliminary inquiry, interview tool (AOC)	The following key events occurred to establish and implement new preliminary inquiry: • Development of the Preliminary Inquiry Workgroup (December 2016) • Review of the Preliminary Inquiry tool and recommendations by CJI (June 2017) • Initial pilot (September 2017) • CQI follow-up (October 2017) • Implementation Team created and plan developed for statewide rollout (January 2018) • Full implementation of the preliminary inquiry (December 2018)	Dec 2016	Dec 2018
Reallocation of Incentive Funds (DJJ)	Part of savings to be used for DJJ community-based services (Fayette and Jefferson counties) by signing contract with Youth Advocate Program, Inc. and for expansion of vocational training programs at DJJ's Louisville Day Treatment program.	March 2017	Contract Renewal Option
Completed Needs-Q and effective case management policy implementation trainings (DJJ)	The Effective Case Management and Needs-Q training curriculum was created in 2017. A training on NEEDS-Q was conducted in April 2017. Case planning policies were released in September 2017 and training with JSWs on effective case management was completed in August and September 2017. A Train- the-Trainer event was held in November 2017 to support sustainability.	April 2017	Nov 2017

Event	Description	Start Date	End Date
Awards made for Incentive Fund (to Provide Alternatives to Out-of-Home Placement for Youth)	Solicitation released in October 2017 and closed on November 2017. Awards (~$900,000) were made to 7 agencies in January.	Oct 2017	Jan 2018

Appendix B. Technical Documentation for ITS Modeling

Each outcome explored in the interrupted time series models is time series data, as suggested by the name of the model. Time series data can be more challenging to work with, since time series outcomes at neighboring time points are often highly correlated. This dependence across time points can be referred to as *autocorrelation*. Time series data may also display seasonal trends (e.g., an outcome that increases during the summer months but decreases every winter).

Autocorrelation violates the assumption of independent outcome observations that is made in standard linear regression, and failing to control for seasonality may result in misleading inference. However, standard time series models that control for these factors, such as ARIMA or ETS, can be complex to fit and difficult to interpret.

Finally, for ITS models in particular, the ITS trend can take different forms. For this report, we considered two potential types of ITS trend: either a change in intercept (shift up or down) or a change in slope (change in trend over time). A change in intercept is modeled by adding a main effect term for the ITS indicator variable, while a change in slope is modeled by adding an interaction between the time variable and the ITS indicator variable.

It is important to remember that in ITS models, there is not a reference level for covariates as one would typically use in individual-level modeling. However, with multi-category variables entering all categories into the model would result in multicollinearity issues, since within a given domain (e.g., gender) the counts will always sum to a monthly total that will be equal across all domains. That is, the sum of Male and Female counts will equal the sum of White and youth of color counts in each month, and similarly for all other variables. To prevent this we leave one category out of each domain—that is, when entering covariates in the model, we enter the monthly count for Males and omit the monthly count for Females. All models also include an interaction term between the SB 200 indicator variable and monthly count of youth of color to explore racial and ethnic disparities. The specific variables entered for each ITS outcome model are presented in later appendices.

For each ITS outcome, we followed a four-step procedure to select the final model:

1. Visually inspect outcome plots for seasonality, and test indicator terms for each month in a linear regression model including all other covariates to identify which, if any, months should be included in the model as indicator variables.

2. Find the time-series model (ARIMA or ETS) that best fits the outcome, including all covariates (and any seasonal terms identified in the previous step) but excluding the ITS indicator variable.
3. Determine whether a linear regression model including lagged and/or seasonal terms approximates the more-complicated time-series model well. If so, use this simpler linear regression model.
4. Test whether an ITS slope effect is significant.[1] If so, include it in the model; if not, use only the ITS main effect.

Step 1 used F-tests in R's lm() function to determine whether models with one or more monthly indicator terms had significantly better model fit than a model with no seasonal variables, as measured by model R-squared.

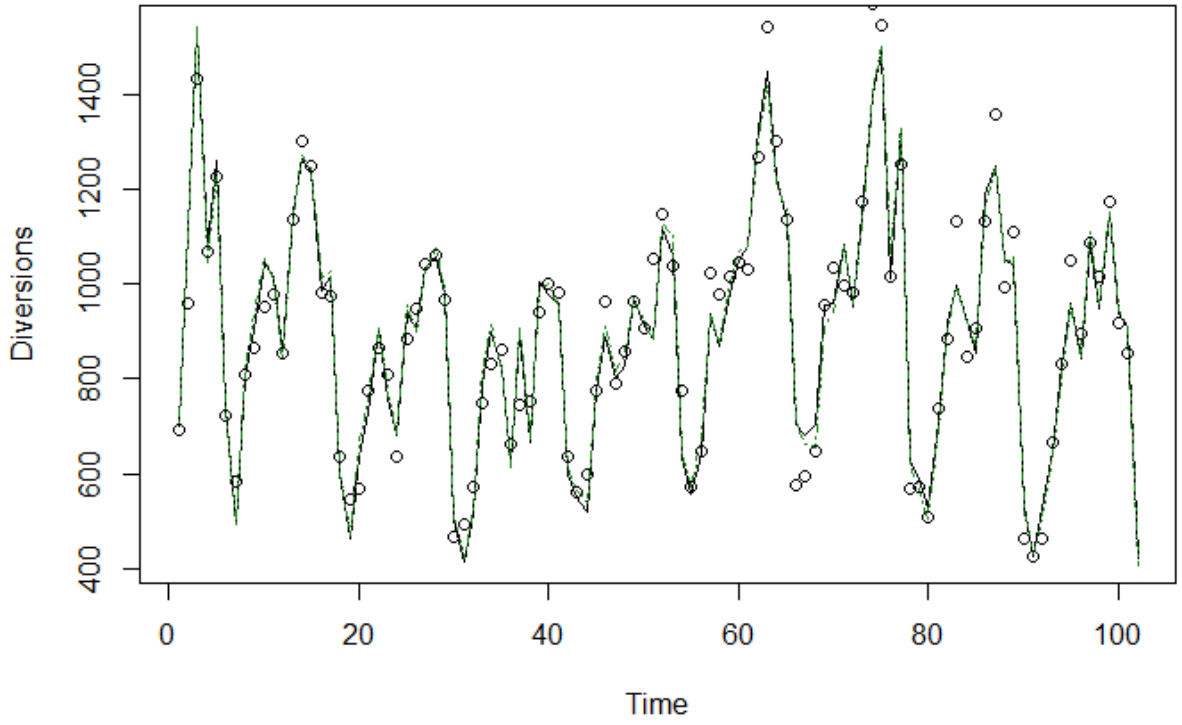
For step 2, we used the R functions auto.arima() and ets() from the forecast package to identify the ARIMA or ETS model with the smallest cross-validation error for each outcome. We used the acf() function to produce autocorrelation plots and visually inspect the autocorrelation trends in each outcome. In each case, an ARIMA model performed best.

Next, in step 3 we compared the mean square error (MSE) of the selected ARIMA model vs. the MSE from a linear regression model including either one or two lagged terms. "Lagged" means the outcome at the previous timepoint; so for example, when modeling the outcome at timepoint 2, we would use the outcome at timepoint 1 as a predictor. The number of lagged terms in the linear regression model depended on the number of autoregressive (AR) terms identified in the ARIMA model—an AR(2) model would imply 2 lagged terms in the linear regression model. Model coefficients and AIC were also compared, along with a visual inspection of model fit. For each outcome, the linear regression model with lagged and seasonal terms approximated the more complicated ARIMA models very well, with negligible increases (and in some cases, decreases) in MSE and AIC.

Figure 1 below shows an example of the comparison between model fit for the diversion outcome; the solid black line is the model fit for the ARIMA model, while the dashed green line is the linear regression model fit. The lines are virtually indistinguishable, suggesting that the simpler linear regression model is reasonable here.

[1] In this step we also checked whether a negative binomial model performed better than the selected linear regression model. Negative binomial models are often used in modeling count data and can sometimes provide better model fit when linear regression assumptions are not met, but are much more complicated to fit and interpret. We found for all outcomes tested that negative binomial models did not perform significantly better than the linear regression models, and often performed worse.

Figure 1. Comparison of ARIMA vs. Linear Regression Model Fit, Diversion Outcome



The final step in model fitting was to test an interaction (ITS slope) term. We used F-tests to test whether adding the time vs. ITS interaction term significantly improved model fit over using the ITS main effect term only. If so, the interaction term was retained in the final model; if not, only the ITS main effect was used in the final model.

Appendix C: Interrupted Time Series, Linear Regression Model, Monthly Diversion Count

Note that all covariates listed below, with the exception of Time and SB 200 Time Period, are in terms of monthly counts. For example, Race: youth of color is the number of referrals involving youth of color in that month. A category in parentheses, such as (White), indicates the complimentary category of a factor that was excluded from the model to avoid multicollinearity issues. See the Appendix B – Technical Documentation for ITS Modeling for more details

Table 1. Coefficients for ITS Model, Monthly Diversion Count

	Coefficient	Standard Error	t-statistic	p-value
Intercept	-309.74	95.89	-3.23	0.0018
Diversion Count in Previous Month	0.13	0.04	3.05	0.0031
Diversion Count Two Months Prior	0.07	0.04	2.01	0.0481
Race				
Youth of color (White)	0.07	0.21	0.34	0.7378
Gender				
Male (Female)	1.09	0.16	6.86	<0.0001
Prior Complaint				
One or More Prior Complaints (Any)	0.02	0.39	0.04	0.9693
One or More Prior Public Complaints	-0.08	0.41	-0.20	0.8386
Severity of Referral Offense				
Felony[1] (Misdemeanor/Other)	-0.24	0.19	-1.26	0.2129
Referral Group				
Public Offense (Status)[2]	-0.30	0.12	-2.51	0.0141
Seasonal Indicator				
Month in April, May, or June	-60.66	22.05	-2.75	0.0072
Time, in Months, since January 2011	2.71	0.60	4.56	<0.0001
SB 200 Time Period				
Post-SB 200 (Pre-SB 200)	-171.54	79.92	-2.15	0.0346
SB 200 x Race: Youth of color	0.46	0.14	3.38	0.0011

[1] Both monthly misdemeanor and monthly other severity counts are excluded from the model. This is because the correlation between monthly other severity counts and monthly status offense (referral group) counts is extremely high (r=0.99). Including either monthly misdemeanor or other severity counts in the model led to unstable model fitting; including both monthly felony and misdemeanor counts causes multicollinearity issues as well, since the monthly sum of felony and misdemeanor counts is nearly identical to the monthly count of public offense referrals.

[2] In 39 out of 102 months, there were one or more cases with an unknown referral group. On average, there were 1.6 cases with unknown referral group in such months. These cases are collapsed into status offenses because they are too rare to enter in the model separately.

Table 2. Contrasts from ITS Monthly Diversion Count Model, Pre- vs. Post-SB 200

	Pre-SB 200	Post-SB 200	Difference	t-statistic	p-value
Overall estimated mean, Monthly diversion count	856	960	104	3.68	0.0004
Estimated slope coefficient, Monthly youth of color count	0.07	0.53	0.46	3.38	0.0011

Appendix D. Descriptive Characteristics of All Referred Youth and Youth without Any Prior Complaints, 2011-2019

	All Referred Youth (N = 103, 130)		Youth without Any Prior Complaints (n=79,542)	
	N	%	n	%
Race				
White	75,205	72.9%	58,599	73.7%
Youth of color	27,925	27.1%	20,943	26.3%
Gender				
Female	39,438	38.2%	31,808	40.0%
Male	63,591	61.7%	47,643	59.9%
(Missing)	101	0.1%	91	0.1%
Age				
15 and under	60,172	58.3%	48,112	60.5%
16 and older	42,235	41.0%	30,729	38.6%
(Missing)	723	0.7%	701	0.9%
Severity of Referral Offense				
Felony	15,578	15.1%	12,066	15.2%
Misdemeanor	50,319	48.8%	38,099	47.9%
Other*	37,233	36.1%	29,377	36.9%
Any Priors				
Yes	23,588	22.9%	--	--
No	79,542	77.1%	--	--
Diversion Status				
Yes	64,603	62.6%	52,569	66.1%
No	38,527	37.4%	26,973	33.9%
SB 200 Time Period				
Pre-SB 200	52,503	62.6%	35,091	66.1%
Post-SB 200	50,627	37.4%	44,451	33.9%

*"Other" type of offenses includes: no classification, violation, status, and other offenses.

Appendix E. Cox Regression Model

Table 3. Coefficients for Cox Regression Model, Predictors of Subsequent Complaint (n = 78,713)

	Hazard Ratio	p-value	95% CI
Race			
Youth of color (White)	1.35	.000	1.27, 1.44
Gender			
Male (Female)	1.25	0.000	1.21, 1.29
Age			
15 and under	2.33	0.000	2.24, 2.42
Severity of Referral Offense			
Misdemeanor (Felony)	0.96	0.062	0.91, 1.00
Other (Felony)	1.13	0.000	1.08, 1.19
Diversion Status			
Yes (No)	0.66	0.000	0.63, 0.70
SB 200 Time Period			
Post-SB 200 (Pre-SB 200)	0.83	0.000	0.78, 0.88
***SB 200 x Diversion Status (yes)**	1.15	0.000	1.07, 1.23
***SB 200 x Race**	0.99	0.781	0.92, 1.06
***Diversion Status x Race**	0.89	0.002	0.83, 0.96

*See Table 4 for simple slope tests for the interaction effects

Note. Reference categories are in the parentheses.

Table 4. Simple Slope Tests for Interactions in the Cox Regression Model

	Pre-SB 200	Post-SB 200	Difference	t-statistic	p-value	95% CI
SB 200 x Diversion Status *(See Figure 10)*						
No Diversion	2.34	1.93	-.41	-7.74	0.000	-.512, -.305
Diversion	1.50	.1.42	-.08	-2.39	0.017	-.137, -.014
SB 200 x Race *(see Figure 12)*						
White	1.66	1.49	-.17	-5.56	0.000	-.226, -.108
Youth of color	2.11	1.87	-.24	-3.86	0.000	-.360, -.117
Diversion Status x Race *(see Figure 13)*						
White	1.94	1.38	-.56	-15.07	0.000	-.632, -.487
Youth of color	2.61	1.66	-.95	-12.45	0.000	-1.10, -.801

Appendix F. Interrupted Time Series, Linear Regression Models, Probated Cases

Note that all covariates listed below, with the exception of Time and SB 200 Time Period, are in terms of monthly counts. For example, Race: youth of color is the number of referrals involving youth of color in that month. A category in parentheses, such as (White), indicates the complimentary category of a factor that was excluded from the model to avoid multicollinearity issues. See the Appendix B – Technical Documentation for ITS Modeling for more details.

Table 5. Coefficients for ITS model, Monthly Probated Cases Count, Post-SB 200

	Coefficient	Standard Error	t-statistic	p-value
Intercept	41.21	11.97	3.44	0.0009
Probated Count in Previous Month	-0.17	0.06	-2.67	0.0090
Race				
Youth of color (White)	-0.23	0.13	-1.77	0.0805
Gender				
Male (Female)	0.34	0.09	3.97	0.0001
Severity of Adjudicated Offense				
Misdemeanor (Felony)	0.17	0.09	2.01	0.0472
Other (Felony)	0.32	0.13	2.39	0.0187
Weapons Status				
Weapons Involved (No Weapons)	-0.16	0.20	-0.80	0.4288
Time, in Months, since January 2011	-0.35	0.13	-2.76	0.0070
SB 200 Time Period				
Post-SB 200 (Pre-SB 200)	-34.79	14.40	-2.42	0.0176
Post-SB 200 x Time	0.32	0.15	2.09	0.0396
SB 200 x Race: Youth of color	0.16	0.14	1.16	0.2475

Table 6. Contrasts from ITS Monthly Probated Cases Count Model, Pre- vs. Post-SB 200

	Pre-SB 200	Post-SB 200	Difference	t-statistic	p-value
Overall estimated mean, Monthly probated count	68.6	62.0	-6.7	-1.71	0.0913
Estimated slope coefficient, Monthly youth of color count	-0.23	-0.07	0.16	1.16	0.2475

Table 7. Coefficients for ITS model, Monthly Probated Cases Count, Post-SB 200 Full Implementation

	Coefficient	Standard Error	t-statistic	p-value
Intercept	52.86	16.08	3.29	0.0021
Probated Count in Previous Month	-0.28	0.10	-2.84	0.0071
Race				
Youth of color (White)	-0.32	0.19	-1.67	0.1020
Gender				
Male (Female)	0.39	0.14	2.80	0.0078
Severity of Adjudicated Offense				
Misdemeanor (Felony)	0.19	0.15	1.25	0.2197
Other (Felony)	0.19	0.22	0.88	0.3834
Weapons Offense Status				
Weapons Involved (No Weapons)	-0.10	0.37	-0.26	0.7953
Time, in Months, since January 2011	-0.37	0.16	-2.32	0.0255
SB 200 Time Period				
Post-SB 200 Full Implementation (Pre-Full Implementation)	-159.58	84.76	-1.88	0.0670
Post-SB 200 Full Implementation x Time	1.44	0.75	1.91	0.0636
SB 200 x Race: Youth of color	0.25	0.35	0.72	0.4787

Table 8. Contrasts from ITS Monthly Probated Cases Count Model, Pre- vs. Post-SB 200 Full Implementation

	Pre-SB 200	Post-SB 200 Full Implementation	Difference	t-statistic	p-value
Overall estimated mean, Monthly probated count	84.6	1.0	-83.7	-1.96	0.0568
Estimated slope coefficient, Monthly youth of color count	-0.32	-0.07	0.25	0.71	0.4787

Appendix G. Interrupted Time Series, Linear Regression Models, Committed Cases

Note that all covariates listed below, with the exception of Time and SB 200 Time Period, are in terms of monthly counts. For example, Race: youth of color is the number of referrals involving youth of color in that month. A category in parentheses, such as (White), indicates the complimentary category of a factor that was excluded from the model to avoid multicollinearity issues. See the Appendix B – Technical Documentation for ITS Modeling for more details.

Table 9. Coefficients for ITS model, Monthly Commitments Count, Post-SB 200

	Coefficient	Standard Error	t-statistic	p-value
Intercept	-11.08	6.69	-1.65	0.1013
Commitment Count in Previous Month	0.16	0.08	2.04	0.0439
Race				
Youth of color (White)	0.12	0.09	1.36	0.1759
Gender				
Male (Female)	0.11	0.06	1.78	0.0782
Severity of Adjudicated Offense				
Felony (Misdemeanor)	-0.04	0.06	-0.58	0.5617
Other (Misdemeanor)	0.16	0.09	1.72	0.0889
Weapons Status				
Weapons Involved (No Weapons)	0.32	0.14	2.24	0.0274
Time, in Months, since January 2011	0.27	0.08	3.21	0.0018
SB 200 Time Period				
Post-SB 200 (Pre-SB 200)	1.81	9.91	0.18	0.8557
Post-SB 200 x Time	-0.24	0.11	-2.20	0.0300
SB 200 x Race: Youth of color	-0.01	0.10	-0.14	0.8914

Table 10. Contrasts from ITS Monthly Commitment Count Model, Pre- vs. Post-SB 200

	Pre-SB 200	Post-SB 200	Difference	t-statistic	p-value
Overall estimated mean, Monthly commitment count	36.6	24.5	-12.1	-4.12	0.0001
Estimated slope coefficient, Monthly youth of color count	0.12	0.11	-0.01	0.14	0.8914

Table 11. Coefficients for ITS model, Monthly Commitments Count, Post-SB 200 Full Implementation

	Coefficient	Standard Error	t-statistic	p-value
Intercept	-17.40	8.24	-2.11	0.0411
Commitment Count in Previous Month	0.20	0.12	1.64	0.1100
Race				
Youth of color (White)	-0.01	0.12	-0.11	0.9118
Gender				
Male (Female)	0.16	0.09	1.65	0.1071
Severity of Adjudicated Offense				
Felony (Misdemeanor)	0.03	0.10	0.26	0.7966
Other (Misdemeanor)	0.10	0.14	0.66	0.5142
Weapons Offense Status				
Weapons Involved (No Weapons)	0.22	0.24	0.92	0.3653
Time, in Months, since January 2011	0.35	0.10	3.68	0.0007
SB 200 Time Period				
Post-SB 200 (Pre-SB 200)	-43.13	54.50	-0.79	0.4334
Post-SB 200 x Time	0.16	0.48	0.33	0.7404
SB 200 x Race: Youth of color	0.03	0.22	0.12	0.9056

Table 12. Contrasts from ITS Monthly Commitment Count Model, Pre- vs. Post-SB 200 Full Implementation

	Pre-SB 200	Post-SB 200 Full Implementation	Difference	t-statistic	p-value
Overall estimated mean, Monthly commitment count	36.7	2.1	-34.7	-1.26	0.2167
Estimated slope coefficient, Monthly youth of color count	-0.01	0.01	0.03	0.12	0.9056

Appendix H. Interrupted Time Series, Linear Regression Models, Out-of-Home Placement Outcomes

Note that all covariates listed below, with the exception of Time and SB 200 Time Period, are in terms of monthly counts. For example, Race: youth of color is the number of referrals involving youth of color in that month. A category in parentheses, such as (White), indicates the complimentary category of a factor that was excluded from the model to avoid multicollinearity issues. See the Appendix B – Technical Documentation for ITS Modeling for more details.

Detention Centers

Table 13. Coefficients for ITS model, Monthly Detention Count, Post-SB 200

	Coefficient	Standard Error	t-statistic	p-value
Intercept	-85.64	24.62	-3.48	0.0008
Detention Center Count in Previous Month	-0.04	0.04	-1.06	0.2939
Race				
Youth of color (White)	0.15	0.15	1.01	0.3132
Gender				
Male (Female)	0.66	0.07	9.56	0.0000
Seasonal Indicator				
Month in June, July, August	-19.47	3.77	-5.16	0.0000
Month of December	-13.10	5.79	-2.26	0.0258
Time, in Months, since January 2011	0.46	0.13	3.60	0.0005
SB 200 Time Period				
Post-SB 200 (Pre-SB 200)	43.06	26.55	1.62	0.1080
SB 200 x Race: Youth of color	-0.18	0.11	-1.55	0.1248

Table 14. Contrasts from ITS Monthly Detention Count Model, Pre- vs. Post-SB 200

	Pre-SB 200	Post-SB 200	Difference	t-statistic	p-value
Overall estimated mean, Monthly detention center count	260	265	4.5	0.58	0.5624
Estimated slope coefficient, Monthly youth of color count	0.15	-0.03	-0.18	-1.55	0.1248

Table 15. Coefficients for ITS model, Monthly Detention Count, Post-SB 200 Full Implementation

	Coefficient	Standard Error	t-statistic	p-value
Intercept	-102.50	30.96	-3.31	0.0019
Detention Center Count in Previous Month	-0.08	0.06	-1.31	0.1961
Race				
Youth of color (White)	0.01	0.21	0.03	0.9781
Gender				
Male (Female)	0.76	0.11	7.15	0.0000
Seasonal Indicator				
Month in June, July, August	-16.59	6.11	-2.72	0.0096
Month of December	-9.52	9.42	-1.01	0.3182
Time, in Months, since January 2011	0.45	0.30	1.50	0.1412
SB 200 Time Period				
Post-SB 200 Full Implementation (Pre-SB 200)	60.90	55.90	1.09	0.2822
SB 200 x Race: Youth of color	-0.21	0.29	-0.72	0.4746

Table 16. Contrasts from ITS Monthly Detention Count Model, Pre- vs. Post-SB 200 Full Implementation

	Pre-SB 200	Post-SB 200 Full Implementation	Difference	t-statistic	p-value
Overall estimated mean, Monthly detention center count	271	288	17	0.69	0.4916
Estimated slope coefficient, Monthly youth of color count	0.01	-0.20	-0.21	-0.72	0.4746

Youth Development Centers

Table 17. Coefficients for ITS model, Monthly YDC Count, Post-SB 200

	Coefficient	Standard Error	t-statistic	p-value
Intercept	-8.41	12.12	-0.69	0.4894
YDC Count in Previous Month	0.10	0.09	1.10	0.2738
Race				
Youth of color (White)	-0.03	0.07	-0.36	0.7181
Gender				
Male (Female)	0.03	0.08	0.46	0.6462
Seasonal Indicator				
Month in June, July, August	5.42	1.87	2.90	0.0046
Time, in Months, since January 2011	0.02	0.07	0.25	0.8016
SB 200 Time Period				
Post-SB 200 (Pre-SB 200)	-1.96	13.38	-0.15	0.8839
SB 200 x Race: Youth of color	-0.01	0.06	-0.17	0.8675

Table 18. Contrasts from ITS Monthly YDC Count Model, Pre- vs. Post-SB 200

	Pre-SB 200	Post-SB 200	Difference	t-statistic	p-value
Overall estimated mean, Monthly YDC count	34.8	30.7	-4.1	-1.05	0.2984
Estimated slope coefficient, Monthly youth of color count	-0.03	-0.04	-0.01	0.17	0.8675

Table 19. Coefficients for ITS model, Monthly YDC Count, Post-SB 200 Full Implementation

	Coefficient	Standard Error	t-statistic	p-value
Intercept	-8.86	17.77	-0.50	0.6210
YDC Count in Previous Month	0.08	0.15	0.54	0.5920
Race				
Youth of color (White)	0.00	0.12	0.02	0.9840
Gender				
Male (Female)	0.03	0.13	0.22	0.8280
Seasonal Indicator				
Month in June, July, August	7.88	3.17	2.49	0.0170
Time, in Months, since January 2011	0.11	0.16	0.64	0.5240
SB 200 Time Period				
Post-SB 200 Full Implementation (Pre-SB 200)	-14.67	29.16	-0.50	0.6180
SB 200 x Race: Youth of color	0.02	0.15	0.15	0.8840

Table 20. Contrasts from ITS Monthly YDC Count Model, Pre- vs. Post-SB 200 Full Implementation

	Pre-SB 200	Post-SB 200 Full Implementation	Difference	t-statistic	p-value
Overall estimated mean, Monthly YDC count	40.3	30.3	-10.0	-0.76	0.4492
Estimated slope coefficient, Monthly Youth of color count	0.01	0.02	0.02	0.15	0.8840

Group Homes

Table 21. Coefficients for ITS model, Monthly Group Home Count, Post-SB 200

	Coefficient	Standard Error	t-statistic	p-value
Intercept	9.68	5.87	1.65	0.1020
Group Home Count in Previous Month	-0.05	0.10	-0.46	0.6470
Race				
Youth of color (White)	0.01	0.02	0.69	0.4940
Gender				
Male (Female)	-0.01	0.04	-0.20	0.8390
Time, in Months, since January 2011	-0.01	0.03	-0.38	0.7040
SB 200 Time Period				
Post-SB 200 (Pre-SB 200)	-4.20	6.82	-0.62	0.5390
SB 200 x Race: Youth of color	0.02	0.03	0.71	0.4800

Table 22. Contrasts from ITS Monthly Group Home Count Model, Pre- vs. Post-SB 200

	Pre-SB 200	Post-SB 200	Difference	t-statistic	p-value
Overall estimated mean, Monthly group home count	12.1	12.5	0.4	0.17	0.5624
Estimated slope coefficient, Monthly youth of color count	-0.01	0.01	0.02	0.71	0.4798

Table 23. Coefficients for ITS model, Monthly Group Home Count, Post-SB 200 Full Implementation

	Coefficient	Standard Error	t-statistic	p-value
Intercept	14.62	6.15	2.38	0.0219
Group Home Count in Previous Month	-0.27	0.14	-1.86	0.0700
Race				
Youth of color (White)	0.02	0.04	0.42	0.6733
Gender				
Male (Female)	0.00	0.02	-0.22	0.8245
Time, in Months, since January 2011	0.04	0.06	0.68	0.4986
SB 200 Time Period				
Post-SB 200 Full Implementation (Pre-SB 200)	-21.63	11.67	-1.86	0.0704
SB 200 x Race: Youth of color	0.08	0.06	1.35	0.1827

Table 24. Contrasts from ITS Monthly Group Home Count Model, Pre- vs. Post-SB 200 Full Implementation

	Pre-SB 200	Post-SB 200 Full Implementation	Difference	t-statistic	p-value
Overall estimated mean, Monthly group home count	14.5	9.9	-4.6	-0.90	0.3729
Estimated slope coefficient, Monthly youth of color count	0.02	0.10	0.08	1.35	0.1827

Appendix I. Supplemental Analyses and Documentation on Measurement of Race and Ethnicity

Given the focus of this report on racial and ethnic disparities, we carefully considered how to define racial and ethnic categories based on the available data. We were limited in part because the data provided is collapsed across race and ethnicity, meaning that we cannot identify non-Hispanic White vs. Hispanic White, for example. Hispanic youth in particular may be underrepresented using these data. Sample sizes also limit our ability to analyze the detailed race categories that rarely occur in Kentucky's juvenile justice population, such as Native American or multiracial youth.

Ultimately, to present the strongest possible analyses and to maximize the power for analyses of youth of color, we made the decision to primarily use a collapsed version of race/ethnicity: White vs. youth of color, which included Black, Hispanic, Asian, Native American, multiracial, and youth who identified as other or unknown racial or ethnic group. The following sections provide more context for the data and analytic issues that led us to make this decision. Wherever possible in the report, we presented descriptive statistics by detailed racial and ethnic groups, collapsing very small groups to avoid compromising data confidentiality for youth in the rarest racial/ethnic groups.

Individual-Level Analysis

Table 25 shows the breakdown of racial and ethnic categories for all referred youth and youth without any prior complaints. As shown in the table, the racial and ethnic breakdown of the subset of youth without any prior complaints mirrors the racial and ethnic breakdown of all referred youth in 2011-2019. We also see that for both populations of youth, Black youth made up a majority of racial and ethnic minority youth (71% and 69% for all referred and youth without any priors, respectively).

Table 25. Racial and Ethnic Categories for All Referred Youth and Youth without Any Prior Complaints, 2011-2019

	All Referred Youth (N = 103, 130)		Youth without Any Prior Complaints (n=79,542)	
	N	%	n	%
White	**75,205**	**72.9**	**58,599**	**73.7**
Black	19,736	19.1	14,402	18.1
Hispanic	3,571	3.5	2,957	3.7
Asian	343	0.3	286	.4
Native American	224	0.2	177	.2
multiracial	794	0.8	420	.5
other	1,065	1.0	822	1.0
unknown	2,192	2.1	1,879	2.4
Total: Youth of color	**27,925**	**27.1**	**20,943**	**26.3**
Overall Total	103,130	100%	79,542	100%

Similar to the analyses reported in the full report, we focus on youth without any prior complaints to examine the effects of SB 200 on youth outcomes. The descriptive statistics in Table 26 shows the proportion of youth with diversion agreement and those who received a subsequent complaint pre- and post- SB 200 among youth without any prior complaints. For this and the remaining supplemental analyses, we created four categories of race and ethnicity—(1) White (74%), (2) Black (18%), (3) Hispanic (4%), and (4) other (4%; which includes Asian, Native American, multiracial, other, and unknown race/ethnicity). These very small groups were collapsed into an other category because they are too small to model individually.

Table 26. Proportion of Diverted Youth and with Subsequent Complaints, Pre- and Post-SB 200

	With Diversion Agreement			Had a Subsequent Complaint		
	Pre- SB 200	Post-SB 200	Difference (percentage pts)	Pre-SB 200	Post-SB 200	Difference (percentage pts)
White	16,820 (63%)	23,648 (74%)	+11	4,638 (17%)	5,898 (19%)	+2
Black	3,092 (48%)	4,682 (59%)	+11	1,532 (24%)	2,017 (25%)	+1
Hispanic	556 (61%)	1,521 (74%)	+13	182 (20%)	415 (20%)	0
other	597 (53%)	1,653 (67%)	+14	219 (19%)	427 (17%)	-2
Total	21,065 (60%)	31,504 (71%)	+11	6,571 (19%)	8,757 (20%)	+1

Next, we ran the same Cox regression model shown in Appendix E, but using the four categories of race/ethnicity. The findings are consistent with findings shown in Appendix E. Specifically, youth who received referrals post-SB 200 had lower risk of receiving subsequent complaints than youth who received referrals pre-SB 200. Diversion was also associated with lower risk of subsequent complaints and there was a significant interaction between diversion status and SB 200. The risk of subsequent complaint was lower post-SB 200 compared to pre-SB 200 for youth placed on diversion and youth not on diversion. In addition, there was a significant decline from pre- to post-SB 200 in risk of subsequent complaints and this decline was greater for youth not on diversion (average decrease of .40 points) than for youth on diversion (average decrease of .03 points)

Youth and case characteristics were also significant predictors of subsequent complaints. Focusing on race and ethnicity in particular, Black and Hispanic youth were significantly at greater risk for subsequent complaints compared to White youth. However, White youth and youth of other racial/ethnic background did not differ statistically on risk of subsequent complaint. Also consistent with the Cox regression model in Appendix E, the interaction between SB 200 and race/ethnicity was not statistically significant; that is, regardless of SB 200 time period, youth of color had greater risk of subsequent complaint than White youth. However, the interaction between diversion status and race was statistically significant. Specifically, Black and White youth placed on diversion had lower risk of receiving subsequent complaints compared to Black and White youth not placed on diversion. In addition, the difference in predicted risk for subsequent complaint for youth placed and not placed on diversion was greater among Black youth (-.1.03) than White youth (-.58), suggesting that diversion seemed to have a greater positive effect on Black youth than White youth.

Table 27. Coefficients for Cox Regression Model (4 Categories of Race/Ethnicity), Predictors of Subsequent Complaint (n = 78,713)

	Hazard Ratio	p-value	95% CI
Race			
Black (White)	1.41	.001	1.31, 1.51
Hispanic (White)	1.25	.014	1.05, 1.50
other (White)	1.07	.421	.91, 1.26
Gender			
Male (Female)	1.25	.001	1.21, 1.30
Age			
15 and under	2.33	.001	2.24, 2.42
Severity of Referral Offense			
Misdemeanor (Felony)	.96	.085	.91, 1.01
Other (Felony)	1.15	.001	1.09, 1.20
Diversion Status			
Yes (No)	.66	.001	.62, .70
SB 200 Time Period			
Post-SB 200 (Pre-SB 200)	.83	.001	.78, .88
***SB 200 x Diversion Status (yes)**	1.15	.001	1.08, 1.23
***SB 200 x Race**			
SB 200 x Black	1.04	.293	.96, 1.13
SB 200 x Hispanic	.98	.862	.82, 1.18
SB 200 x other	.86	.073	.72, 1.01
***Diversion Status x Race**			
yes x Black	.89	.004	.82, .96
yes x Hispanic	.88	.146	.73, 1.05
yes x other	1.09	.329	.92, 1.29

*See Table 28 for simple slope tests for the interaction effects

Note. Reference categories are in the parentheses.

Table 28. Simple Slope Tests for Interactions in the Cox Regression Model

	Pre- SB 200	Post-SB 200	Difference	t-statistic	p-value	95% CI
SB 200 x Diversion Status						
No Diversion	2.35	1.95	-.40	-7.50	.001	-.503, -.295
Diversion	1.50	1.44	-.06	-2.10	.036	-.129, -.005
SB 200 x Race						
White	1.67	1.50	-.17	-5.54	.001	-.226, -.108
Black	2.19	2.05	-.14	-1.90	.058	-.289, -.005
Hispanic	1.94	1.71	-.23	-1.36	.175	-.563, .102
other	1.87	1.44	-.43	-2.90	.004	-.714, -.139
Diversion Status x Race						
White	1.95	1.38	-.58	-15.13	.001	-.639, -.492
Black	2.80	1.77	-1.03	-11.28	.001	-1.21, -.849
Hispanic	2.42	1.50	-.92	-4.75	.001	-1.30, -.538
other	1.93	1.48	-.45	-3.03	.002	-.739, -.158

As shown in Table 29, we also ran a similar Cox regression model on a subset population of referred youth that included only Black and White youth. Overall, the findings are consistent with the findings in the Cox regression model shown in Appendix E and the model shown in Table 27.

Table 29. Coefficients for Cox Regression Model (Black and White youth), Predictors of Subsequent Complaint (n = 72,285)

	Hazard Ratio	p-value	95% CI
Race			
Black (White)	1.41	.001	1.31, 1.51
Gender			
Male (Female)	1.26	.001	1.21, 1.30
Age			
15 and under	2.34	.001	2.25, 2.44
Severity of Referral Offense			
Misdemeanor (Felony)	.96	.088	.91, 1.01
Other (Felony)	1.15	.001	1.09, 1.21
Diversion Status			
Yes (No)	.66	.001	.63, .70
SB 200 Time Period			
Post-SB 200 (Pre-SB 200)	.83	.001	.78, .88
***SB 200 x Diversion Status (yes)**	1.14	.001	1.07, 1.23
***SB 200 x Race**			
SB 200 x Black	1.04	.313	.96, 1.13
***Diversion Status x Race**			
yes x Black	.89	.004	.82, .96

Table 30. Simple Slope Tests for Interactions in the Cox Regression Model

	Pre-SB 200	Post-SB 200	Difference	t-statistic	p-value	95% CI
SB 200 x Diversion Status						
No Diversion	2.34	1.97	-.37	-6.71	.001	-.48, -.26
Diversion	1.50	1.44	-.06	-1.81	.070	-.12, .00
SB 200 x Race						
White	1.67	1.51	-.17	-5.53	.001	-23, -.11
Black	2.21	2.06	-.15	-1.93	.053	-.29, .00
Diversion Status x Race						
White	1.96	1.39	-.57	-15.07	.001	-.65, -.50
Black	2.82	1.78	-1.04	-11.25	.001	-1.22, -.86

Population-Level Analysis

The concerns for population-level analysis are similar to those discussed for the individual-level analysis, but with two additional considerations. First, we are now modeling monthly data rather than an individual level data file. There are 108 monthly time points, meaning that even an overall sample size that seems large may be inadequate when divided among 108 months. This is magnified by the fact that the youth and case population is unevenly distributed among months, so that counts may be adequate for ITS modeling in some but not all months. A second related consideration is privacy and confidentiality. Youth involvement in the juvenile justice system is in itself sensitive information. A youth in a rare racial/ethnic group could potentially be identified in our dataset: for example, if someone knows a youth was not living at home for several months and is able to use our dataset to see that there was at least one youth in that same rare racial group in out-of-home placement over that exact same timeframe, they may correctly be able to guess that the youth was involved in the juvenile justice system.

Table 31 below shows the distribution of youth by race in the datasets used for ITS modeling. The other race/ethnicity group is not broken down further because many of the smaller groups have zero counts in some months. In all datasets both pre- and post-SB 200, note that Black and White youth make up 85% or more of the cases in an average month. The monthly average counts for the other race/ethnicity group are also quite low, as few as 20-24 cases per month on average among adjudicated youth. Both of these (low percentage and low counts) are a problem for ITS models; the ITS models are trying to model trends across time, which typically require more power to model and detect changes than simple contrasts (as in a standard linear model).

Table 31. Monthly Average Racial and Ethnic Categories for Referred Youth, Adjudicated Youth, and Youth in Out-of-Home Placements by SB 200 Status, 2011-2019

	Monthly Referrals		Monthly Adjudicated Youth		Monthly Out-of-Home Placements	
	Pre-SB n (%)	Post-SB n (%)	Pre-SB n (%)	Post-SB n (%)	Pre-SB n (%)	Post-SB n (%)
Monthly Average	2,131	1,593	233	144	628	466
Race						
White	1,512	1,048	151	84 (59%)	405 64%)	251 (54%)
Youth of color	620	545 (34%)	82 (35%)	60 (41%)	222	215 (46%)
*Black**	496	396 (25%)	58 (25%)	40 (28%)	158	151 (32%)
other	124 (6%)	149 (9%)	24 (10%)	20 (13%)	64 (11%)	64 (14%)

We ran an ITS model on monthly referrals, using monthly diversions as the outcome. This analysis is parallel to the analysis shown in Table 1 of Appendix C, except that we break youth of color into Black and other race/ethnicity.

	Coefficient	Standard Error	t-statistic	p-value
Intercept	-293.90	97.96	-3.00	0.0035
Diversion Count in Previous Month	0.12	0.04	2.81	0.0062
Diversion Count Two Months Prior	0.08	0.04	2.07	0.0418
Race				
Black (White)	0.04	0.25	0.18	0.8596
other race/ethnicity (White)	0.44	0.70	0.63	0.5302
Gender				
Male (Female)	1.04	0.17	6.29	0.0000
Prior Complaint				
One or More Prior Complaints (Any)	-0.09	0.42	-0.22	0.8267
One or More Prior Public Complaints	0.08	0.47	0.17	0.8691
Severity of Referral Offense				
Felony[1] (Misdemeanor/Other)	0.31	0.19	1.67	0.0992
Referral Group				
Public Offense (Status)[2]	-0.57	0.17	-3.32	0.0013
Seasonal Indicator				
Month in April, May, or June	-59.66	22.18	-2.69	0.0086
Time, in Months, since January 2011	1.94	0.82	2.36	0.0204
SB 200 Time Period				
Post-SB 200 (Pre-SB 200)	-127.56	84.58	-1.51	0.1352
SB 200 x Race: Black	0.40	0.23	1.70	0.0925
SB 200 x Race: Other race/ethnicity	0.42	0.69	0.61	0.5438

This model is more difficult to interpret due to the presence of two separate interaction terms, but the overall conclusion is similar: this model estimates an average of 111 additional diversions post-SB 200, compared to 104 in the original model. In this model, neither interaction term between SB 200 status and race is statistically significant. However, both SB 200 by race interaction terms have very similar coefficients (0.40 and 0.42), and when they were combined in the original model we did find a statistically significant impact at the p=0.05 level. This is an example of how separating out youth of color into fine categories can reduce the ability to detect racial and ethnic differences, even when the actual effect appears to be similar across different racial categories.

We could not fit stable ITS models to either the adjudicated youth or out-of-home placement populations using finer racial/ethnic classifications due to extremely small sample sizes (less than 5, and occasionally 0 cases) for some months, so results for these models are not presented.