
Supplementary Materials: Impact of Cannabis and Cannabis Legalization on US Atrial Septal Defect Rates

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Table S1.: 12 Periods of Analysis and Mean ASD Rates

Period	Year	Group	Mean ASD Rate
1989-1990	1990	1	27.4
1995-1999	1997	2	33.9
2003-2007	2005	3	51.2
2004-2008	2006	4	59.2
2005-2009	2007	5	58.2
2007-2011	2009	6	56.3
2008-2012	2010	7	67.1
2009-2012	2011	8	69.3
2010-2014	2012	9	75.9
2011-2015	2013	10	86.5
2012-2016	2014	11	90.3
2016-2020	2018	12	116.0

Table S2.: Cannabis and Cannabinoid Exposure Data

Year	Δ^9 THC	CBD	CBC	CBN	CBG	THCV	High Potency	Monthly Cannabis	THC * HiPo-tency * Monthly Use
2007	9.58	0.46	0.24	0.31	0.44	0.1	-	5.89	-
2008	8.9	0.41	0.25	0.32	0.37	0.1	-	6.33	-
2009	8.3	0.39	0.24	0.37	0.33	0.1	28.16	6.71	1,567.78
2010	10	0.28	0.25	0.43	0.34	0.08	33.52	6.87	2,301.18
2011	12.3	0.22	0.25	0.45	0.42	0.09	40.31	6.81	3,374.11
2012	14.1	0.2	0.24	0.56	0.43	0.09	47.00	7.09	4,697.88
2013	13.4	0.17	0.27	0.63	0.47	0.1	44.91	7.43	4,469.76
2014	14.6	0.15	0.23	0.65	0.46	0.09	43.53	8.04	5,109.03
2015	13.4	0.18	0.22	0.75	0.47	0.08	33.97	8.45	3,847.70
2016	13.2	0.19	0.23	0.73	0.46	0.08	41.15	8.79	4,775.64
2017	14.13	0.56	0.28	0.62	0.54	0.09	58.82	9.51	7,903.35
2018	14.88	0.71	0.29	0.7	0.58	0.19	68.27	10.16	10,320.50

Table S3.: Introductory Mixed Effects Regression Final Model Results

Parameter			Model	
Parameter	Estimate (C.I.)	P-Value	Metric	Value
Simple			AIC	3,327
<i>ASD ~ LM.Cannabis</i>			BIC	3,349
LM.Cannabis	0.62 (0.48, 0.76)	1.41E-17	LogLik	-1,659
			S.D.	3.870
<i>ASD ~ Δ9THC</i>			AIC	3,356
Δ9THC	0.39 (0.28, 0.50)	3.36E-11	BIC	3,378
			LogLik	-1,674
			S.D.	3.900
<i>ASD ~ LM.Cannabis + Δ9THC</i>			AIC	3,328
Δ9THC	0.14 (0.00, 0.28)	0.0454	BIC	3,356
LM.Cannabis	0.52 (0.34, 0.69)	9.91E-09	LogLik	-1,659
			S.D.	3.870
Interactive in Cannabis				
<i>ASD ~ LM.Cannabis * Δ9THC</i>			AIC	3,331
LM.Cannabis	0.65 (0.51, 0.80)	1.91E-18	BIC	3,365
Δ9THC: LM.Cannabis	-0.05 (-0.10, 0.00)	0.0422	LogLik	-1,660
			S.D.	3.870
Interactive in Cannabinoids			AIC	3,327
<i>ASD ~ LM.Cannabis * Δ9THC * CBG</i>			BIC	3,355
LM.Cannabis	0.52 (0.35, 0.69)	4.06E-09	LogLik	-1,659
Cannabigerol	0.21 (0.01, 0.41)	0.0414	S.D.	3.870
Additive in Ethnic Drugs, Income and Race				
<i>ASD ~ eCigarettes + eCannabis + eBnge.Alcohol + eAnalgesics + eCocaine + Med.Income + Race</i>				
eCigarettes	-0.55 (-1.09, -0.01)	4.77E-02	AIC	33,593
eCannabis	9.62 (8.04, 11.20)	1.26E-31	BIC	33,660
eAnalgesics	19.4 (16.77, 22.03)	6.52E-45	LogLik	-16,785
sCocaine	-27.8 (-32.25, -23.35)	2.77E-33	S.D.	1,484
Race.NHBlack	0.35 (0.24, 0.46)	1.49E-09		
Race.NHWhite	-0.66 (-0.78, -0.55)	3.92E-28		
Race.Total	-0.23 (-0.33, -0.13)	8.46E-06		

Interactive				
Interactive in Drugs + Income and Race : Cannabis Interaction				
<i>ASD ~ eCigarettes * eCannabis + eBng.Alcohol + eAnalgesics + eCocaine + Med.Income + Race + Race: Cannabis</i>				
eCigarettes	-18.9 (-20.41, -17.39)	8.53E-115	AIC	32,860
eCannabis	-15.8 (-24.4, -7.2)	0.0003	BIC	32,971
eAnalgesics	13.5 (10.09, 16.91)	1.22E-14	LogLik	-16,410
eBng.Alcohol	-1.76 (-2.86, -0.66)	0.0018	S.D.	1,223
eCocaine	-24.5 (-28.36, -20.64)	3.50E-34		
Median.Income	0.53 (0.25, 0.81)	2.38E-04		
Race.Hispanic	1.96 (1.70, 2.22)	1.55E-46		
Race.NHAIAN	3.98 (3.47, 4.49)	1.11E-49		
Race.NHBlack	3.45 (3.17, 3.73)	2.06E-109		
Race.NHWhite	2.74 (2.42, 3.06)	7.63E-60		
Race.Total	2.57 (2.28, 2.86)	1.16E-62		
eCannabis: eCigarettes	290 (267.66, 312.34)	1.72E-122		
eCannabis: RaceHispanic	-15.60 (-22.21, -8.99)	3.81E-06		
eCannabis: Race.NHAIAN	-50.4 (-58.87, -41.93)	1.84E-30		
eCannabis: Race.NHBlack	-35.6 (-42.58, -28.62)	5.65E-23		
eCannabis: Race.NHWhite	-38.5 (-45.54, -31.46)	4.33E-26		
eCannabis: Race.Total	-29.8 (-36.74, -22.86)	7.16E-17		

Table S4.: Variable Importance Table S from Full Interactive Mixed Effects Model

Group	Term	Estimate	CI_lower	CI_upper
Cannabis	Eth.Cannabis	0.0234	0.0080	0.0536
Cannabis	Eth.Cannabis + Eth.Cigarettes:Eth.Cannabis + Eth.Cannabis:Race	0.0193	0.0039	0.0489
Cannabis	Eth.Cigarettes:Eth.Cannabis + Eth.Cannabis:Race	0.0155	0.0001	0.0443
Cannabis	Eth.Cannabis:Race	0.0149	0.0000	0.0436
Cannabis	Eth.Cannabis + Eth.Cannabis:Race	0.0111	0.0000	0.0396
Race	Race	0.0121	0.0000	0.0396
Ciga- rettes	Eth.Cigarettes + Eth.Cigarettes:Eth.Cannabis	0.0108	0.0000	0.0371
Cannabis	Eth.Cigarettes:Eth.Cannabis	0.0030	0.0000	0.0313
Cannabis	Eth.Cannabis + Eth.Cigarettes:Eth.Cannabis	0.0030	0.0000	0.0313
Ciga- rettes	Eth.Cigarettes	0.0031	0.0000	0.0292
Ciga- rettes	Eth.Cigarettes:Eth.Cannabis	0.0030	0.0000	0.0292
Bngalc	Eth.Binge.Alcohol	0.0000	0.0000	0.0256
MHY	Median.Income	0.0000	0.0000	0.0237
Cocaine	Eth.Cocaine	0.0000	0.0000	0.0197

Table S5.: Summary Variable Importance Table from Full Interactive
Mixed Effects Model by main covariate

Group	total_partial_R2	max_CI_upper	n_terms
Cannabis	0.0903	0.0536	7
Cigarettes	0.0169	0.0371	3
Race	0.0121	0.0396	1
Binge Alcohol	0	0.0256	1
Median Income	0	0.0237	1
Cocaine	0	0.0197	1

Table S6.: Final Survey regression models

Parameter			Model	
Parameter	Estimate (C.I.)	P-Value	Metric	Value
Simple				
ASD ~ LM.Cannabis			AIC	5744
LM.Cannabis	0.5 (0.38, 0.62)	2.01E-17	BIC	2344
			Deviance	2329
ASD ~ Δ9THC		4.46E-20	AIC	5760
Δ9THC	0.58 (0.36, 0.79)	1.68E-07	BIC	2363
			Deviance	2348
ASD ~mrjmon + Δ9THC				
LM.Cannabis	0.41 (0.29, 0.53)	3.25E-11	AIC	5739
Δ9THC	0.33 (0.1, 0.56)	4.91E-03	BIC	2343
			Deviance	2320
ASD ~mrjmon x Δ9THC			AIC	5737
Δ9THC x LM.Cannabis	0.38 (0.29, 0.47)	1.93E-15	BIC	2335
			Deviance	2320
ASD ~mrjmon * Δ9THC				
LM.Cannabis	-2.26 (-3.77, -0.75)	0.0033	AIC	5731
Δ9THC	3.24 (1.57, 4.91)	0.0001	BIC	2339
LM.Cannabis: Δ9THC	1.07 (0.44, 1.7)	0.0008	Deviance	2309
ASD ~ mrjmon * d9THC * CBG				
Δ9THC	1.5 (0.83, 2.17)	1.29E-05	AIC	5733
Cannabigerol	2.33 (0.74, 3.92)	0.0041	BIC	2346
LM.Cannabis: Δ9THC	0.44 (0.22, 0.67)	0.0001	Deviance	2309
LM.Cannabis: Cannabigerol	0.86 (0.24, 1.48)	0.0064		
Additive				
ASD ~Cigarettes + mrjmon x d9THC + bngalc + anlyr + cocyr + Med.Income + Race				
Cigarettes	4.97 (3.72, 6.22)	9.04E-15	AIC	5391
Δ9THC x LM.Cannabis	0.84 (0.75, 0.93)	2.76E-68	BIC	1985
Median.Income	-1.72 (-2.02, -1.42)	1.37E-28	Deviance	1917
Race.NHAIAN	0.6 (0.44, 0.76)	2.51E-13		

Race.NHBlack	0.42 (0.25, 0.59)	2.02E-06		
Interactive				
ASD ~Cigarettes + mrjmon * d9THC * CBG + bngalc + anlyr + cocyr + Med.Income + Race				
Cigarettes	5.16 (3.87, 6.45)	6.69E-15	AIC	5362
LM.Cannabis	-2.29 (-3.76, -0.82)	2.18E-03	BIC	1986
Δ9THC	6.52 (4.4, 8.64)	1.88E-09	Deviance	1880
Cannabigerol	-6.57 (-10.47, -2.67)	9.97E-04		
Analgesics	0.42 (0.16, 0.68)	1.44E-03		
Median.Income	-1.62 (-1.93, -1.31)	9.68E-25		
Race.NHAIAN	0.6 (0.44, 0.76)	2.84E-13		
Race.NHBlack	0.42 (0.25, 0.59)	1.60E-06		
Race.NHWhite	0.11 (-0.05, 0.27)	0.1540		
Race.Total	0.2 (0.04, 0.36)	0.0131		
LM.Cannabis: Δ9THC	1.24 (0.64, 1.84)	5.63E-05		
Δ9THC: Cannabigerol	2.88 (1.28, 4.48)	0.0004		
Interactive Including Race: Cannabis				
ASD ~ Cigarettes + mrjmon * d9THC * CBG + bngalc + anlyr + cocyr + Med.Income + Race + Race: Cannabis				
Cigarettes	117 (17.43, 216.57)	0.0216	AIC	5351
LM.Cannabis	-15.5 (-23.99, -7.01)	0.0003	BIC	2008
Δ9THC	14.5 (4.99, 24.01)	0.0028	Deviance	1858
Cannabigerol	0.6 (0.14, 1.06)	0.0100		
Median.Income	-1.85 (-2.16, -1.54)	6.73E-31		
Race.Hispanic	1.53 (0.17, 2.89)	0.0276		
Race.NHAIAN	1.4 (0.05, 2.75)	0.0413		
Cigarettes: LM.Cannabis	49 (13.92, 84.08)	0.0064		
LM.Cannabis: Δ9THC	6.07 (2.66, 9.48)	0.0005		
LM.Cannabis: Race.Hispanic	0.51 (0.01, 1.01)	0.0466		
Cigarettes: LM.Cannabis: Δ9THC	-17.6 (-31.85, -3.35)	0.0156		

Table S7.: Final Generalized Additive Model Regressions

Term	Coefficients				Model	
	EDF	Ref.DF	Statistic	P-Value	Index	Value
Cannabis Models					DF	164
ASD ~ Ethnic.Cannabis.Exp					LogLik	-9418
s(eCannabis)	1	1	7.93	0.0049	AIC	19164
s(Year,State)	162	325	1968	0.0000	Dev.Expl.	89.6%
ASD ~ THC.Exp					DF	76.8
s(d9THC)	4.98	5	155	0.0000	LogLik	-9433
s(Year,State)	70.8	323	1904	0.0000	AIC	19020
					Dev.Expl.	92.3%
ASD ~ Ethnic.Cannabis.Exp + THC.Exp					DF	77.2
s(eCannabis)	1	1	8.46	0.0036	LogLik	-9383
s(Δ 9THC)	8.82	8.92	256	0.0000	AIC	18921
s(Year,State)	66.4	323	1784	0.0000	Dev.Expl.	92.3%
ASD ~ teIR (Ethnic.Cannabis.Exp : THC)					DF	79.8
teIR (eCannabis, Δ 9THC))	8.25	8.71	42.2	3.83E-07	LogLik	-9474
s(Year,State)	70.5	323	1818	0.0000	AIC	19107
					Dev.Expl.	85.2%
ASD ~ teIR (Ethnic.Cannabis.Exp : THC : Cigarettes)					DF	167
teIR (eCannabis : THC : Cigarettes)	3	3	7.91	0.0480	LogLik	-9417
s(Year,State)	163	325	1930	0.0000	AIC	19168
					Dev.Expl.	89.7%
Full Model - Time Interactions						
ASD ~ Cigarettes + Cannabis + Bng.Alcohol + Analgesics + Cocaine + Med.Income + Race + tiIR (Cigarettes: Time) + tiIR (Cannabis: Time)						
Parametric Terms					DF	79.8
	Estimate	Std.Error	z-Value	P-Value	LogLik	-9484
Race.Hispanic	-0.1938	0.0861	-2.251	0.0244	AIC	19128
Race.NHAIAN	0.1923	0.0979	1.964	0.0495	Dev.Expl.	84.4%
Smoothened Terms						
	EDF	Ref.DF	Chi.Squ	P-Value		
s(Cannabis)	1.000	1.001	11.281	0.0008		

tiIR (Cigarettes : Time)	1.000	1.000	9.069	0.0026		
tiIR (Cannabis : Time)	1.502	1.817	9.895	0.0087		
s(Med.Income)	7.243	8.064	21.757	0.0051		
s(Year,State)	63.060	323.000	1595.549	0.0000		
Full Model - Cannabis: Ethnicity Interaction						
ASD ~ Cigarettes + Cannabis + Bng.Alcohol + Analgesics + Cocaine + Med.Income + Race + tiIR(Cannabis: Race)						
Parametric Terms						
	Estimate	Std.Error	z-Value	P-Value	DF	56.6
Hispanic	-0.2329	0.1061	-2.195	0.0282	LogLik	-9490
					AIC	19094
Smoothened Terms					Dev.Expl.	83.9%
	EDF	Ref.DF	Chi.Squ	P-Value		
s(eCannabisj	2.33	3.01	29.5	2.07E-06		
ti(Year, eCannabis)	2.31	2.73	7.78	0.0256		
s(Median.Income)	7.22	8.1	26.1	0.0010		
s(eCocaine)	1.07	1.14	20.8	2.16E-05		
s(State)	37.7	41	1550	0.0000		

Table Key: * - Interaction; eCannabis – Ethnic Cannabis

Table S8.: Legal status analysis

Data		Tests		
Legal Status	ASD Rates (Mean, C.I.)	Test	Value	P-Value
<i>Legal Status</i>				
Illegal	67.82 (63.8, 71.84)			
Medical / Decriminalized	94.74 (86.37, 103.11)			
Legal	190.19 (141.33, 239.05)	Chi.Squ.Trend	2,724	0.0023
Legal v Illegal		Student's t	9.07	1.51E-13
<i>Legal Status - Dichotomized</i>				
Not Legal	74.28 (70.6, 77.96)	Student's t	7.47	1.27E-07
Legal	178.15 (131.68, 224.62)	Chi.Squ.	22,194	Zero
		O.R.	1.82 (1.81, 1.84)	
		R.R.	1.79 (1.77, 1.80)	
		AFE	44.92% (44.48%, 45.35%)	
		E-Values	3.04, 3.02	
		NNH	1 in 48 (48, 49)	

Table S9.: Pairwise Comparison of Cohen's D by Legal Status

Contrast	Cohens D (C.I.)	Adj.P.Value
Decriminalized - Illegal	0.20 (0.31, 0.70)	0.8642
Legal - Illegal	1.29 (0.96, 1.62)	2.23E-11
Medical - Illegal	0.50 (0.31, 0.70)	1.98E-06
Legal - Decriminalized	1.10 (0.54, 1.66)	5.59E-04
Medical - Decriminalized	0.31 (0.22, 0.84)	0.6417
Legal - Medical	0.79 (0.51, 1.07)	1.38E-07

Table S10.: Within- and Between- States Results from Final Hybrid Mixed Effects Regression Model.

Parameter			Model	
Parameter	Estimate (C.I.)	P-Value	Parameter	Value
<i>Bivariate Model</i>				
ASD ~ Legal Status				
StatusLegal	0.50 (0.38, 0.63)	4.23E-15	AIC	2002
StatusDecriminalized	0.08 (-0.12, 0.27)	0.4350	BIC	2035
StatusMedical	0.20 (0.12, 0.27)	3.19E-07	LogLik	-995
			S.D.	0.389
			Conditional Variance	0.692
			Marginal Variance	0.028
			State S.D.	0.572
			Residual S.D.	0.389
<i>Additive Model</i>				
ASD ~ Within_Cannabis + Between_Cannabis + Legal Status				
Between_Cannabis	0.14 (0.11, 0.167)	2.56E-19	AIC	1884
Within_Cannabis	0.31 (0.23, 0.386)	8.25E-14	BIC	1928
StatusLegal	0.16 (0.01, 0.309)	0.0351	LogLik	-934
StatusDecriminalized	-0.04 (-0.23, 0.146)	0.6680	S.D.	0.376
StatusMedical	0.05 (-0.04, 0.127)	0.2740	Conditional Variance	0.713
			Marginal Variance	0.046
			State S.D.	0.573
			Residual S.D.	0.376
<i>Interactive Model</i>				
ASD ~ Within_Cannabis * Between_Cannabis * Legal Status				
Between_Cannabis	0.12 (0.08, 0.16)	5.90E-08	AIC	1868
Within_Cannabis	0.29 (0.18, 0.4)	1.07E-07	BIC	1967
StatusLegal	0.03 (-0.2, 0.25)	0.8130	LogLik	-916
StatusDecriminalized	0.00 (-0.19, 0.2)	0.9790	S.D.	0.371
StatusMedical	0.13 (0.03, 0.22)	0.0089	Conditional Variance	0.719
Between_Cannabis: Within_Cannabis	-0.26 (-0.53, 0.01)	0.0604	Marginal Variance	0.068
Between_Cannabis: StatusLegal	0.19 (0.01, 0.37)	0.0398	State S.D.	0.564
Between_Cannabis: StatusDecriminalized	0.11 (0.00, 0.22)	0.0408	Residual S.D.	0.371
Between_Cannabis: StatusMedical	0.04 (-0.03, 0.10)	0.2690		
Within_Cannabis: StatusLegal	0.83 (0.45, 1.20)	0.0000		
Within_Cannabis: StatusDecriminalized	0.65 (0.29, 1.01)	0.0004		
Within_Cannabis: StatusMedical	-0.19 (-0.38, 0.01)	0.0589		
Between_Cannabis: Within_Cannabis: StatusLegal	-0.65 (-1.13, -0.16)	0.0094		
Between_Cannabis: Within_Cannabis: StatusDecriminalized	-1.14 (-1.95, -0.34)	0.0054		
Between_Cannabis: Within_Cannabis: StatusMedical	0.45 (0.11, 0.80)	0.0100		

Table S11.: Cohen's D Pairwise Contrasts from models of Table S 10

Pairwise Contrast	Cohen's D (C.I.)
<i>Bivariate Model</i>	
Legal - Illegal	1.29 (0.96, 1.62)
Decriminalized - Illegal	0.20 (-0.31, 0.070)
Medical - Illegal	0.50 (0.31, 0.70)
Legal - Decriminalized	1.10 (0.54, 1.66)
Legal - Medical	0.79 (0.51, 1.07)
Medical - Decriminalized	0.31 (- 0.22, 0.84)
<i>Additive Model</i>	
Legal - Illegal	0.43 (0.02, 0.83)
Decriminalized - Illegal	-0.11 (-0.62, 0.40)
Illegal - Medical	0.12 (-0.10, 0.34)
Legal - Decriminalized	0.54 (-0.04, 1.11)
Legal - Medical	0.31 (-0.01, 0.62)
Medical - Decriminalized	0.23 (-0.30, 0.76)
<i>Interactive Model</i>	
Legal - Illegal	0.06 (-0.57, 0.69)
Decriminalized - Illegal	0.00 (0.55, -0.55)
Illegal - Medical	0.33 (0.08, 0.59)
Legal - Decriminalized	0.06 (-0.72, 0.84)
Legal - Medical	-0.28 (-0.86, 0.31)
Medical - Decriminalized	0.34 (-0.24, 0.91)

Table S12.: E-Values from models and comparisons presented

Parameter	E-Value Estimate and 97.5% Lower Bounds
Mixed Effects Models	
eCannabis	7.77E63, 1.97E50
cigmon : LM.Cannabis	723.65, 102.63
LM.Cannabis	118.62, 38.39
LM.Cannabis	117.00, 24.69
Cigarettes : LM.Cannabis	15.61, 7.22
Cannabigerol	3.60, 2.85
$\Delta 9$ THC	4.12, 3.78
$\Delta 9$ THC	3.39, 2.80
$\Delta 9$ THC : LM.Cannabis	3.60, 3.44
LM.Cannabis	4.88, 4.42
LM.Cannabis	4.53, 3.99
LM.Cannabis	4.54, 4.10
LM.Cannabis	4.54, 4.01
LM.Cannabis	4.54, 3.09
LM.Cannabis	5.14, 4.52
LM.Cannabis	4.78, 4.15
LM.Cannabis	5.00, 4.34
LM.Cannabis : Race.Hispanic	4.10, 3.33
LM.Cannabis : Race.NHAIAN	3.97, 3.15
eCannabis	3239.32, 10.65
Survey Models	
$\Delta 9$ THC	1356.66, 162.4
$\Delta 9$ THC	50.56, 9.08
$\Delta 9$ THC	8.43, 4.02
$\Delta 9$ THC	2.97, 2.22
LM.Cannabis	2.68, 2.28
$\Delta 9$ THC	2.13, 1.45
Cannabigerol	20.04, 3.61
LM.Cannabis	24.82, 16.97
LM.Cannabis	2.38, 2.01
$\Delta 9$ THC : Cannabigerol	35.12, 6.65
$\Delta 9$ THC $\times$ LM.Cannabis	2.28, 2.01
$\Delta 9$ THC $\times$ LM.Cannabis	4.06, 3.65
LM.Cannabis : Cannabigerol	4.16, 1.86
LM.Cannabis : $\Delta 9$ THC	5.28, 2.48

LM.Cannabis : Δ^9 THC	2.48, 1.8
LM.Cannabis : Δ^9 THC	6.37, 3.2
eCannabis	2.14E+09, 5.74E+06
Polynomial Models	
eCannabis	4.90E+39, 3.00E+06
eCannabis	2.77E+03, 673.22

Table S13.: Variance Inflation Factors (VIF's) from Table 2

Table S 13A – VIF's for Additive Models

Term	VIF	VIF 95% CI	adj. VIF	Tolerance	Tolerance 95% CI
Model 1 - Additive in Drugs					
Cigarettes	2.51	[2.34, 2.70]	1.58	0.4	[0.37, 0.43]
LM.Cannabis	1.73	[1.62, 1.85]	1.31	0.58	[0.54, 0.62]
Analgesics	2.08	[1.95, 2.23]	1.44	0.48	[0.45, 0.51]
Cocaine	1.13	[1.08, 1.20]	1.06	0.88	[0.83, 0.92]
Model 2 - Additive in Drugs & Income					
Cigarettes	2.74	[2.55, 2.96]	1.66	0.36	[0.34, 0.39]
LM.Cannabis	1.99	[1.87, 2.14]	1.41	0.5	[0.47, 0.54]
Bng.Alcohol	1.12	[1.08, 1.19]	1.06	0.89	[0.84, 0.93]
Analgesics	2.18	[2.04, 2.34]	1.48	0.46	[0.43, 0.49]
log(MHY)	2.24	[2.09, 2.41]	1.5	0.45	[0.42, 0.48]
Model 3 - Additive in Drugs, Income and Race					
Cigarettes	2.79	[2.60, 3.01]	1.67	0.36	[0.33, 0.39]
LM.Cannabis	2.07	[1.94, 2.22]	1.44	0.48	[0.45, 0.52]
Bng.Alcohol	1.13	[1.08, 1.20]	1.06	0.89	[0.83, 0.92]
Analgesics	2.24	[2.09, 2.41]	1.50	0.45	[0.42, 0.48]
Cocaine	1.14	[1.09, 1.21]	1.07	0.88	[0.83, 0.92]
Median.Income	2.24	[2.09, 2.41]	1.50	0.45	[0.42, 0.48]
Race	1.00	[1.00, Inf]	1.00	1.00	[0.00, 1.00]

Table S13B – VIF's for Interactive Model 4

Model 4 – Interactive in Drugs and Race

Term	GVIF	DF	$GVIF^{1/(2*DF)}$
eCigarettes	598.71	3	2.90
eCannabis	15.73	13	1.11
eBng.Alcohol	5.74	1	2.40
eCocaine	2.49	1	1.58
Median.Income	2.31	1	1.52
Race	125.90	11	1.25

Figure S1.: Log ASD Rate by Ethnicity

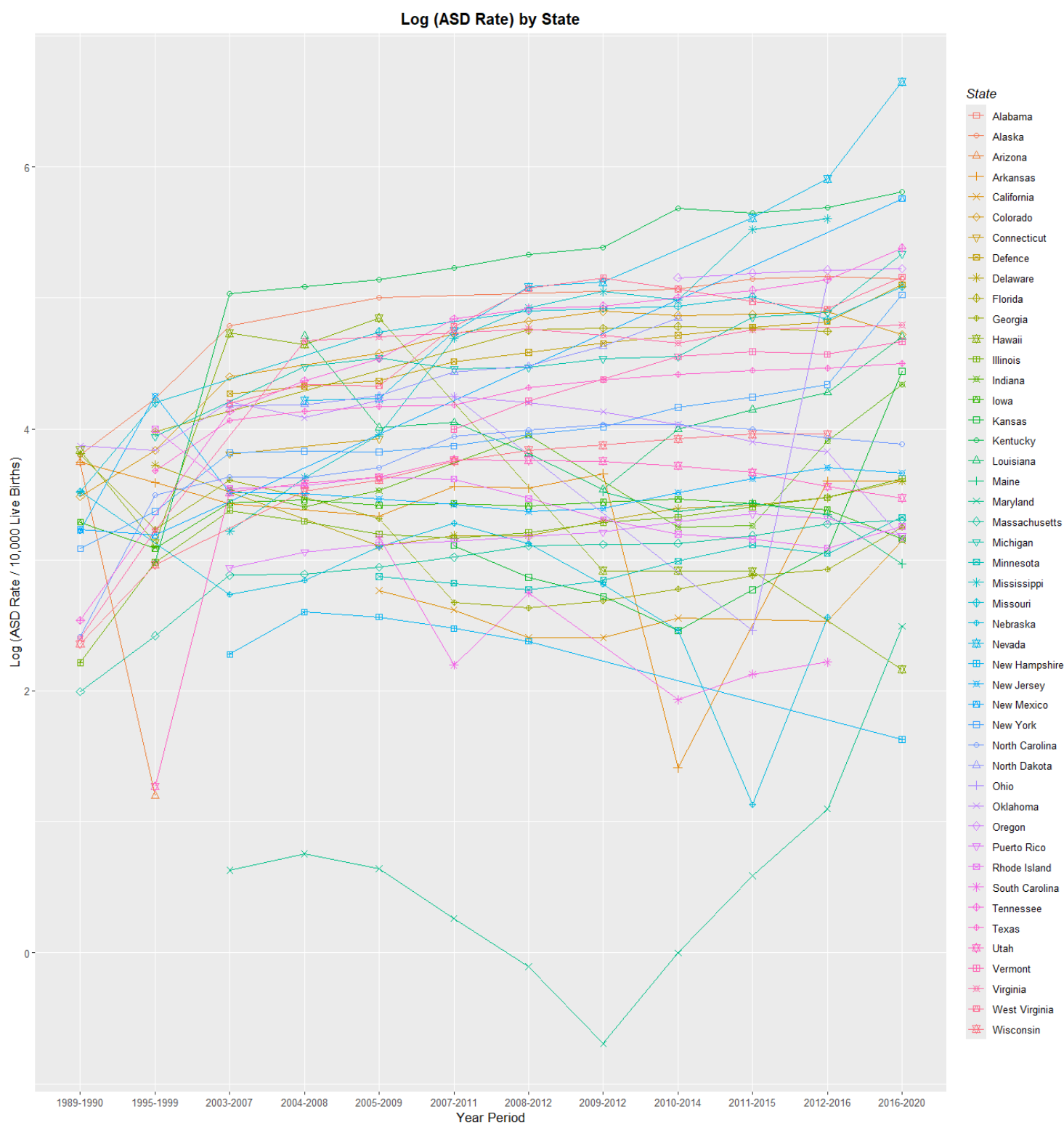


Figure S2.: ASD Rates by Ethnicity by State x 23 A-M

ASD Rate by State by Ethnicity

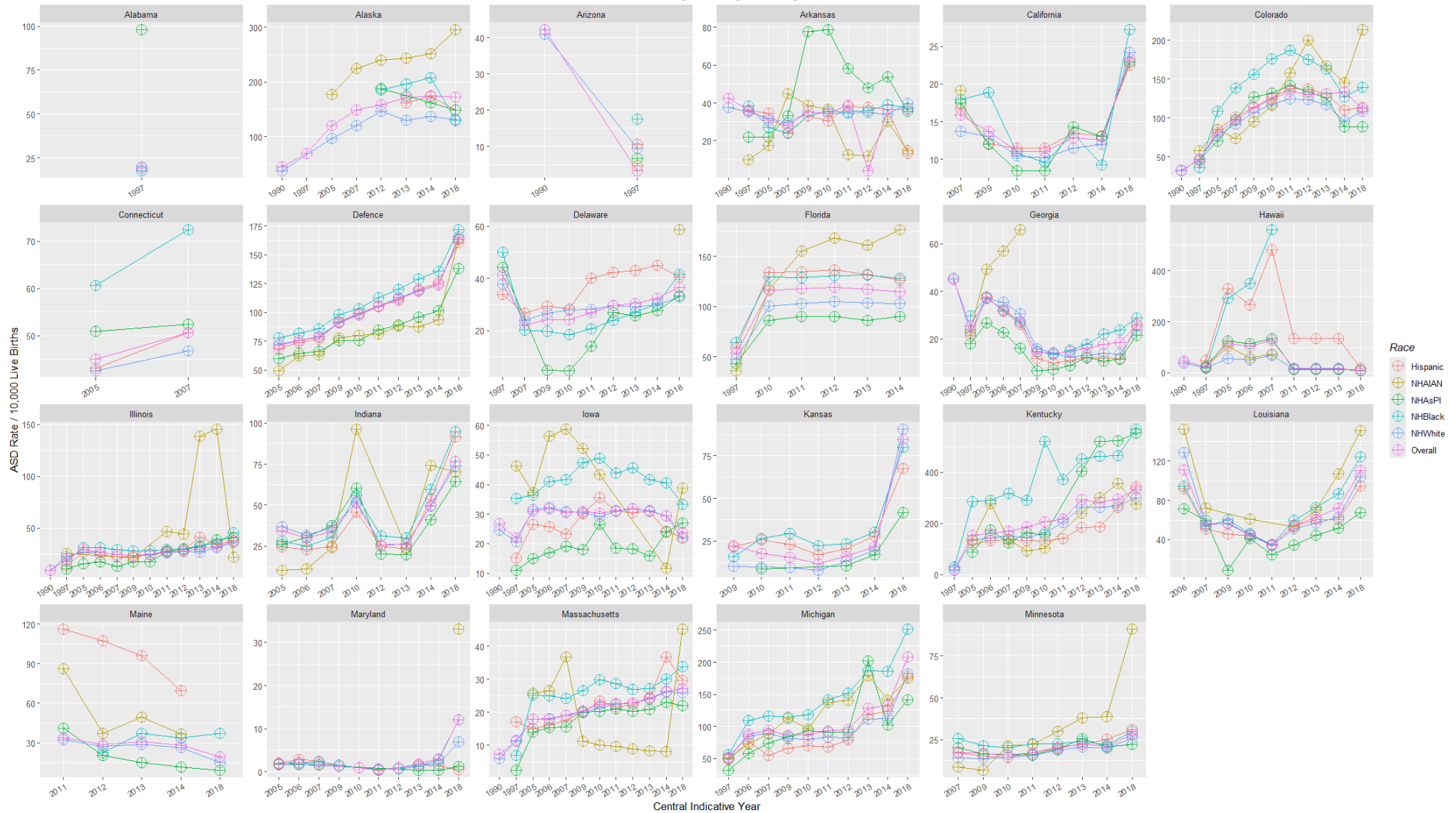


Figure S3.: ASD Rates by Ethnicity by State x 23 M-W

ASD Rate by State by Ethnicity

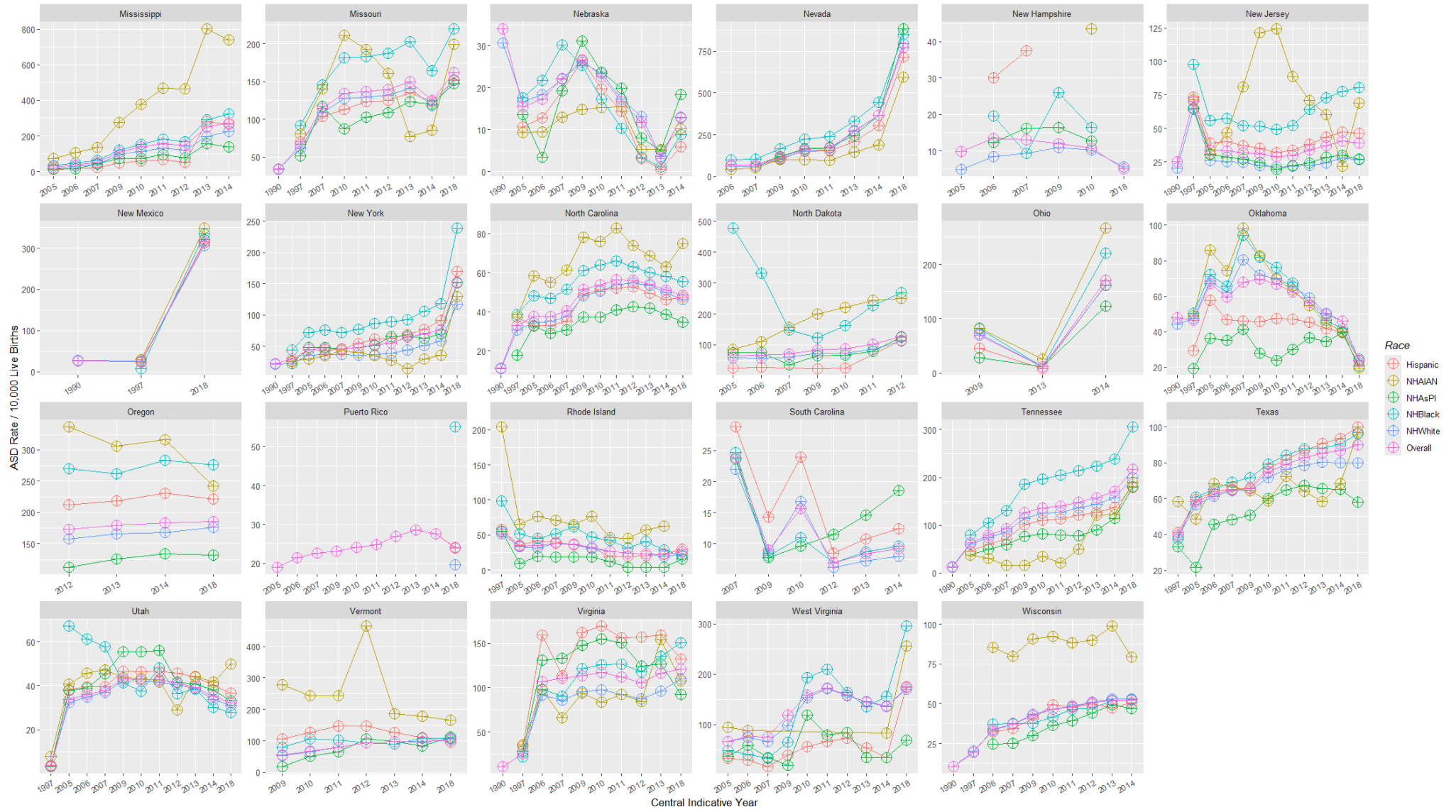


Figure S4.: ASD Rates in Nevada by Ethnicity

ASD Rate in Nevada, USA by Ethnic Background, 2004-2020

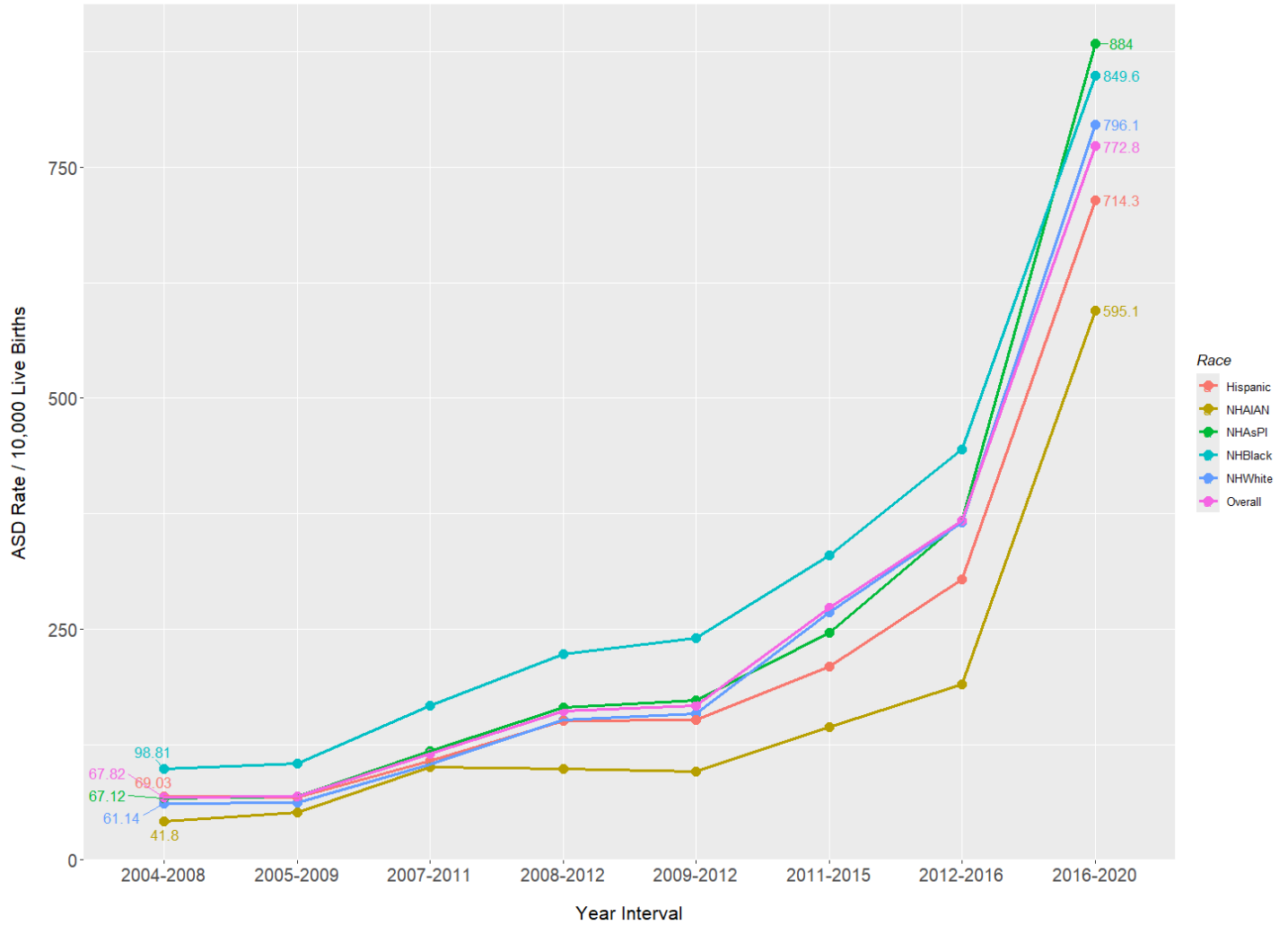


Figure S5.: ASD Rates in New York by Ethnicity

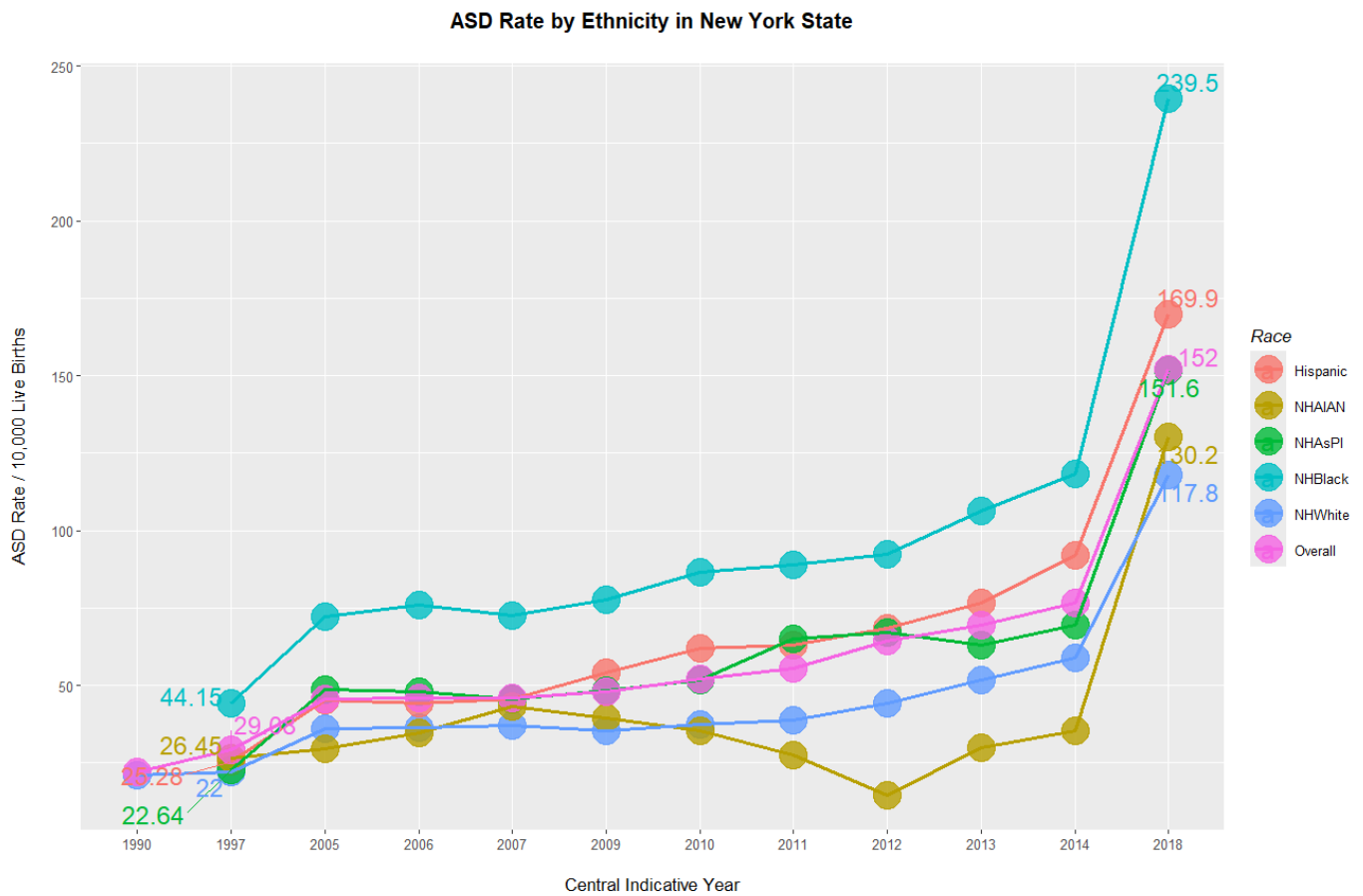


Figure S6.: ASD Rates in New York (More Details) by Ethnicity

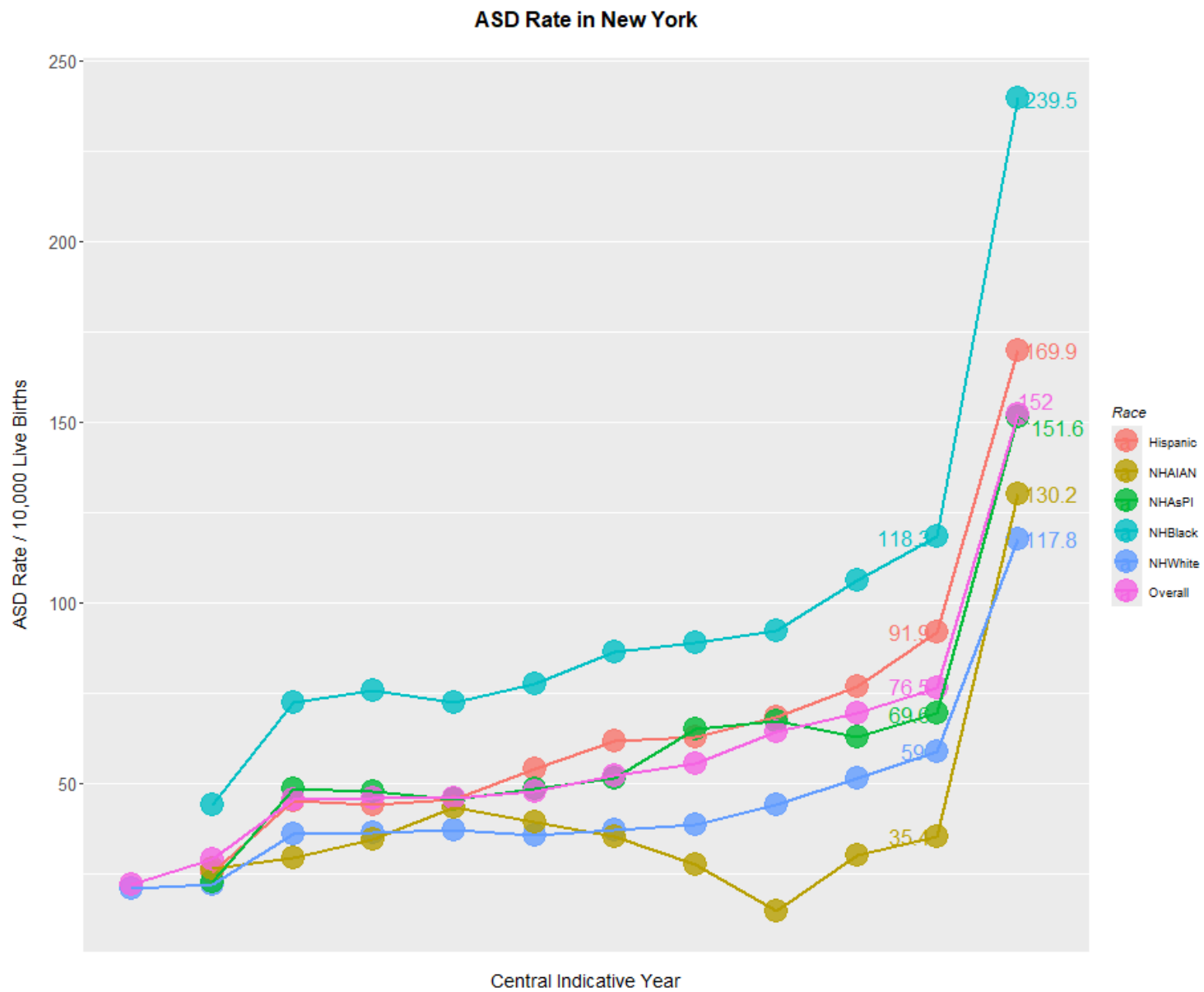


Figure S7.: ASD Rates in Department of Defence by Ethnicity

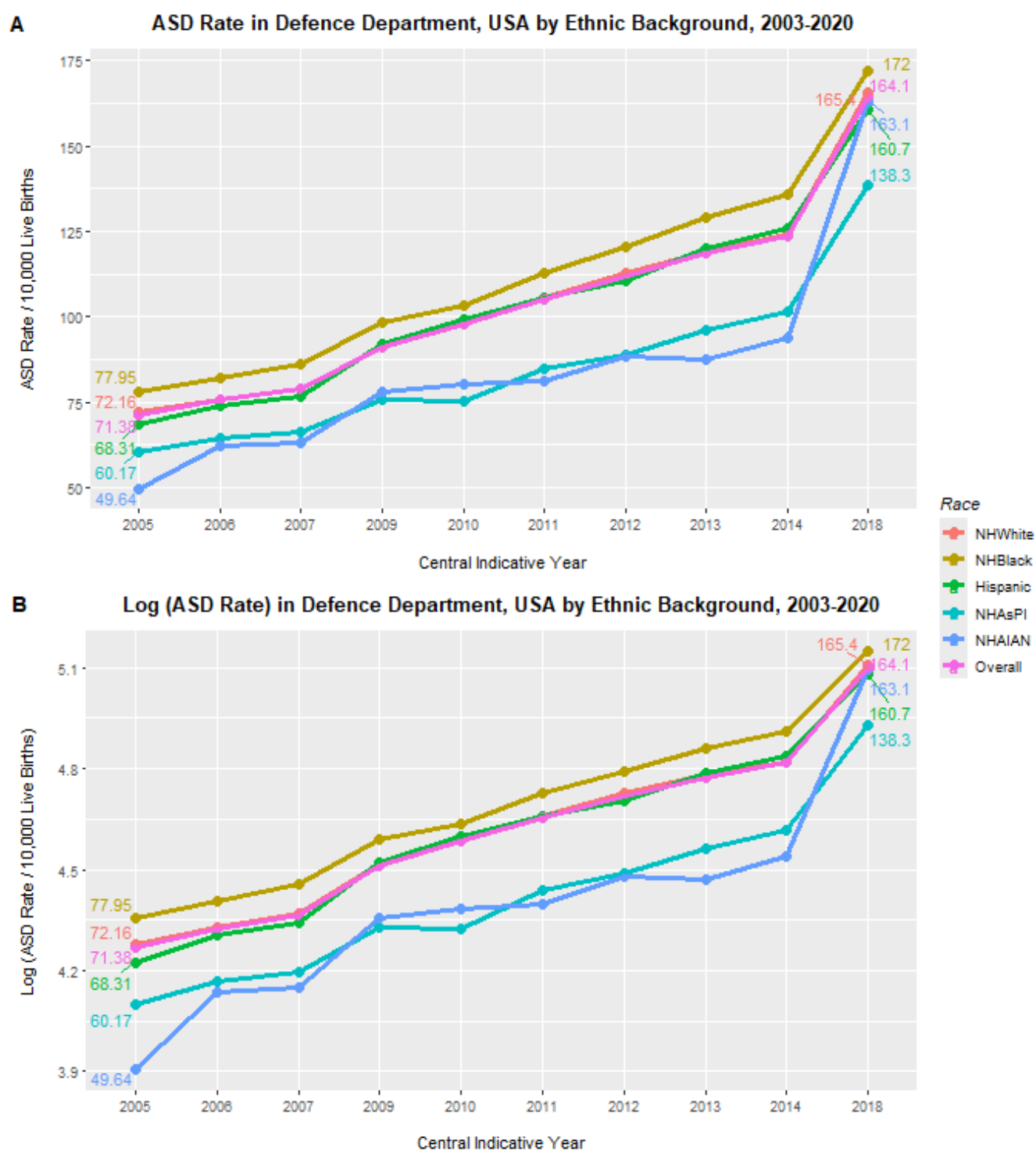


Figure S8.: ASD Rates in Kentucky by Ethnicity

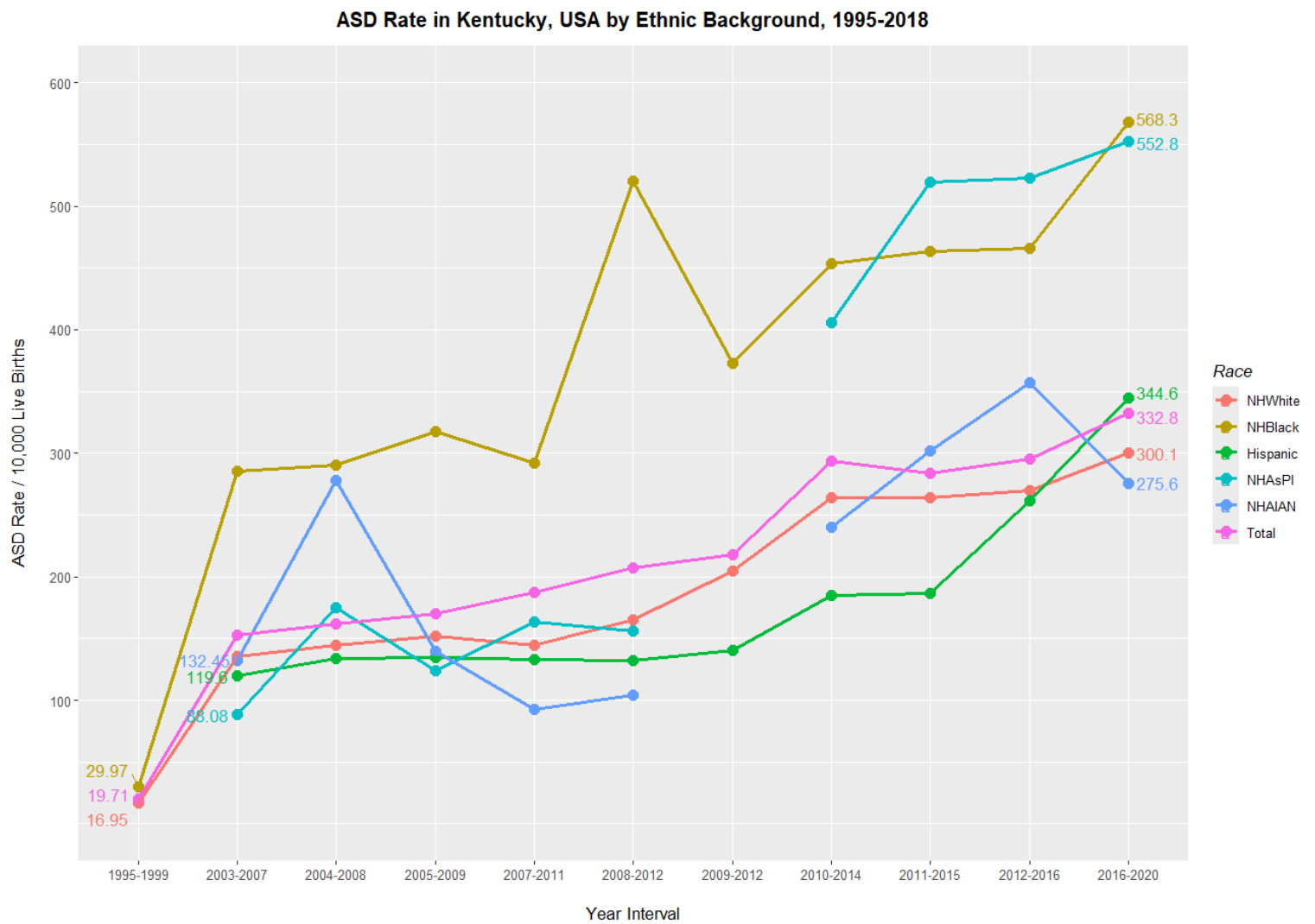


Figure S9.: ASD Rates in Michigan by Ethnicity

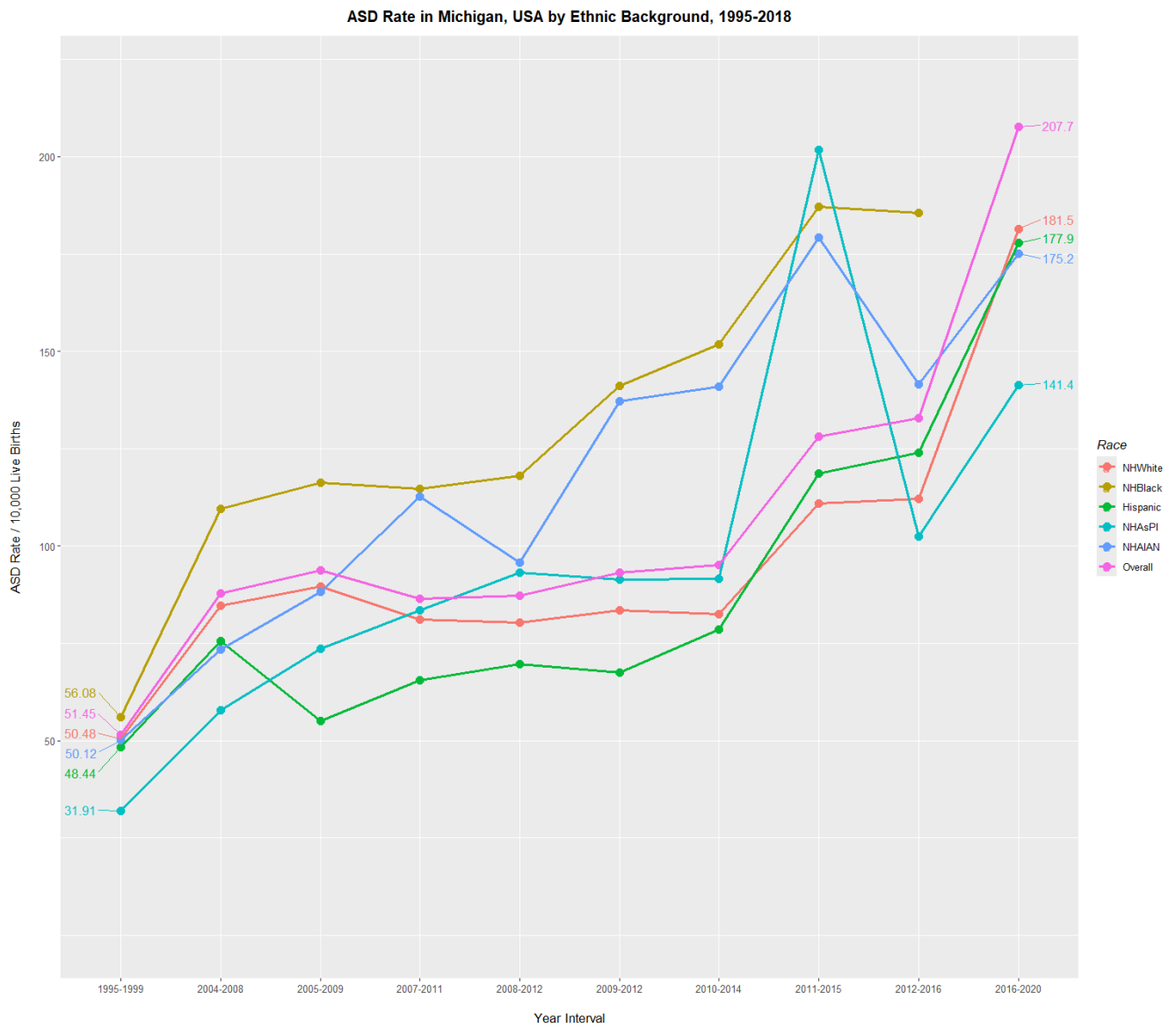


Figure S10.: ASD Rates in Colorado by Ethnicity

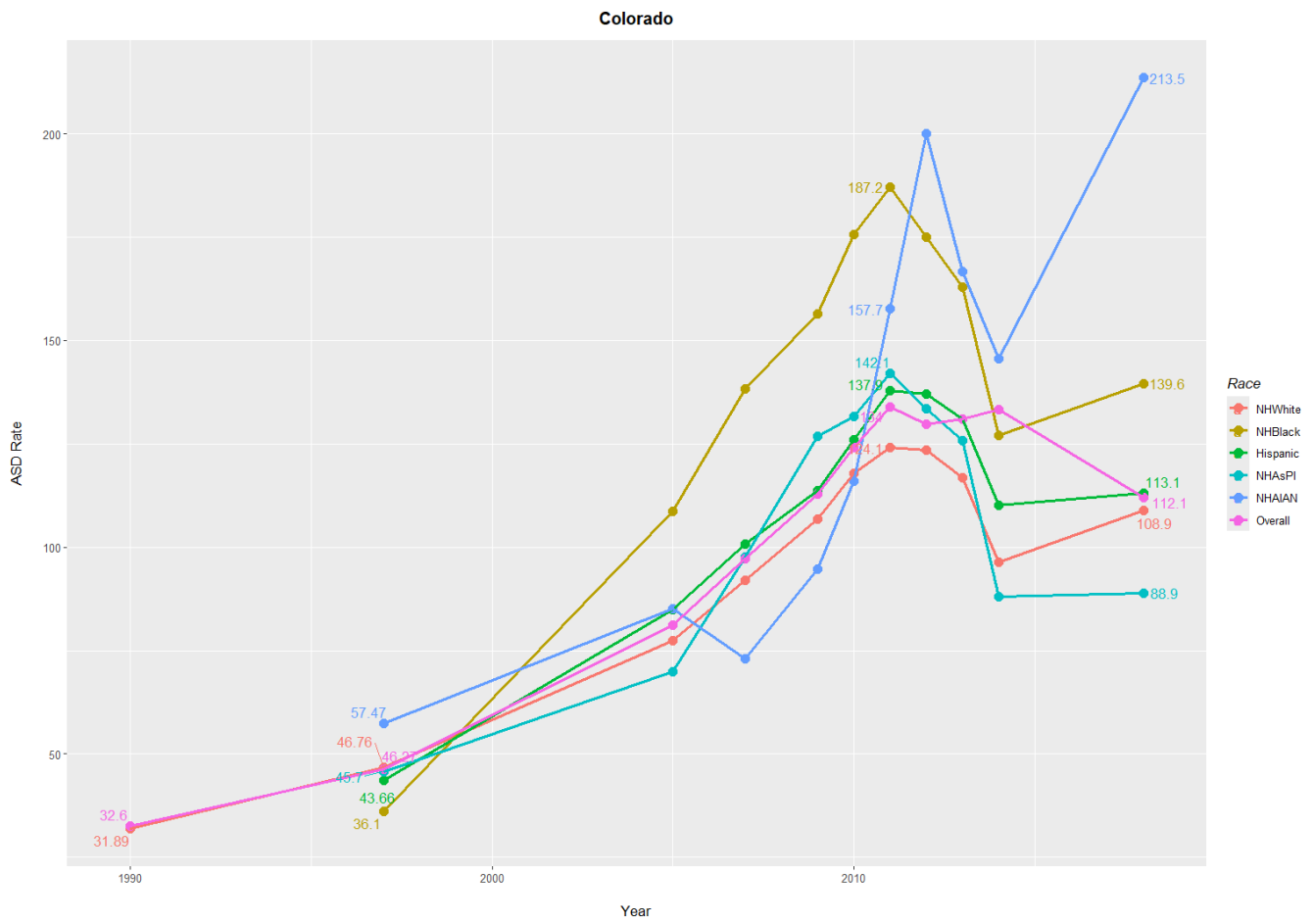


Figure S11.: ASD Rates in Tennessee by Ethnicity

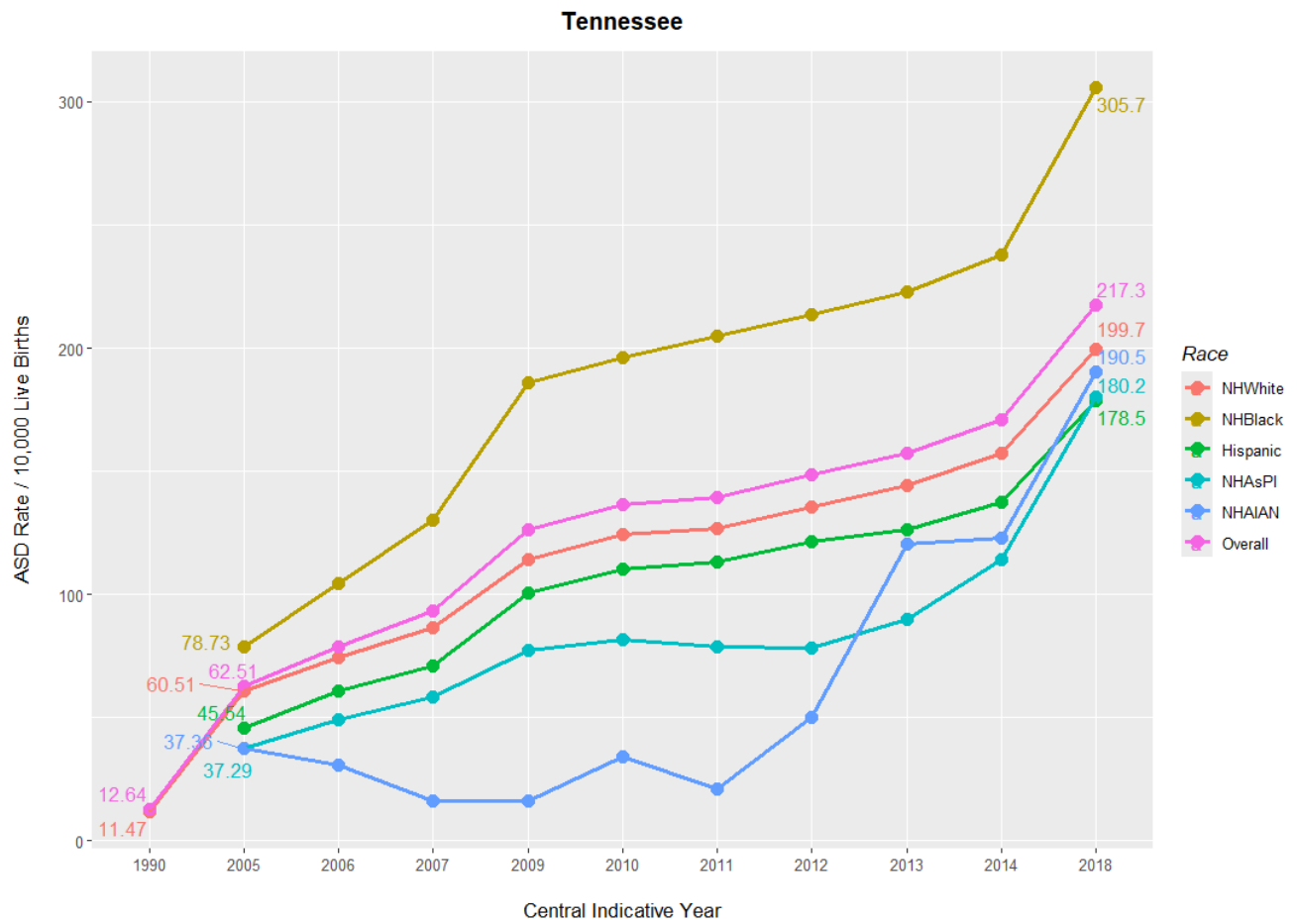


Figure S12.: ASD Rates in Alaska by Ethnicity

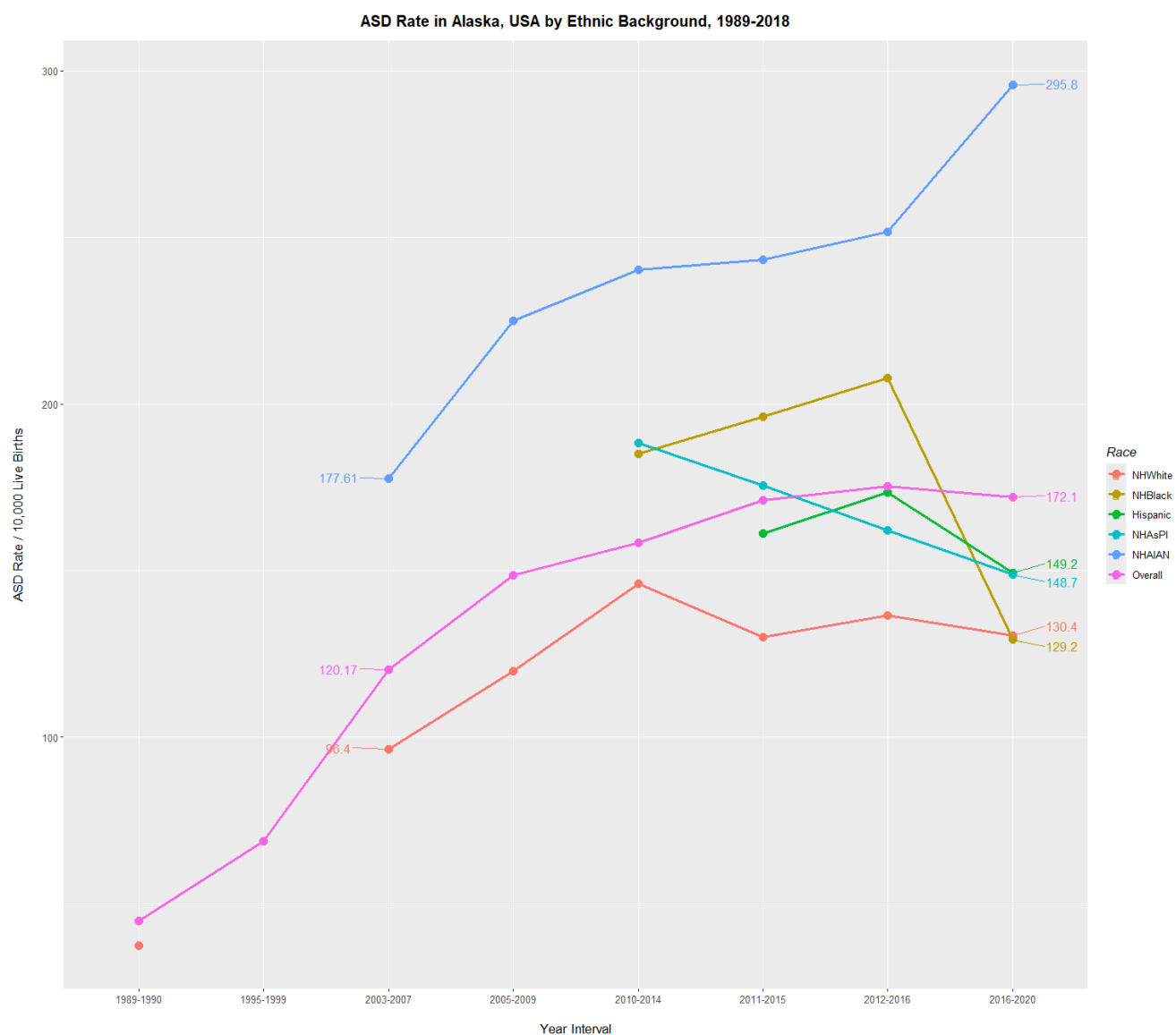


Figure S13.: ASD Rates in Mississippi by Ethnicity

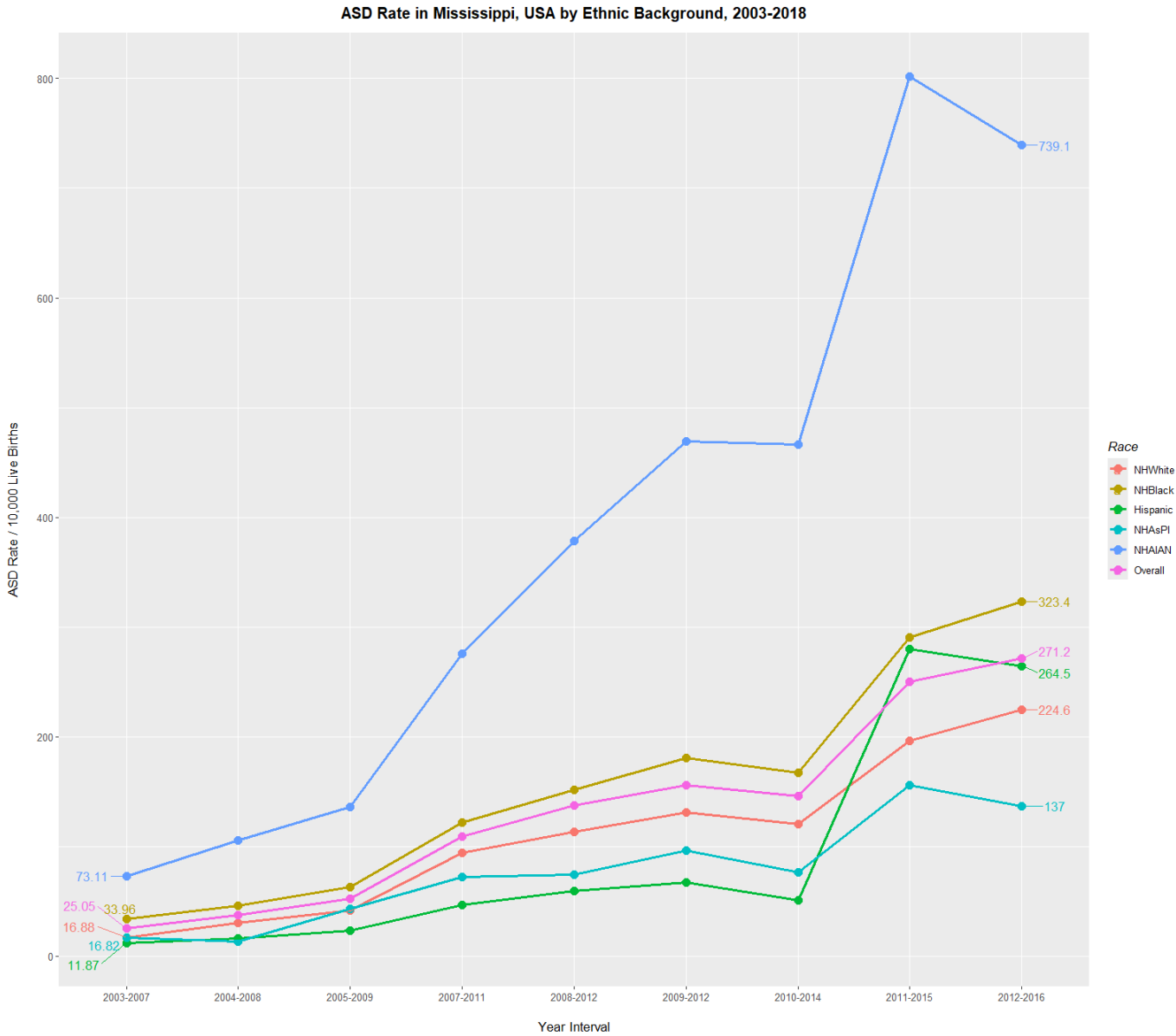


Figure S14.: ASD Rates in Missouri by Ethnicity

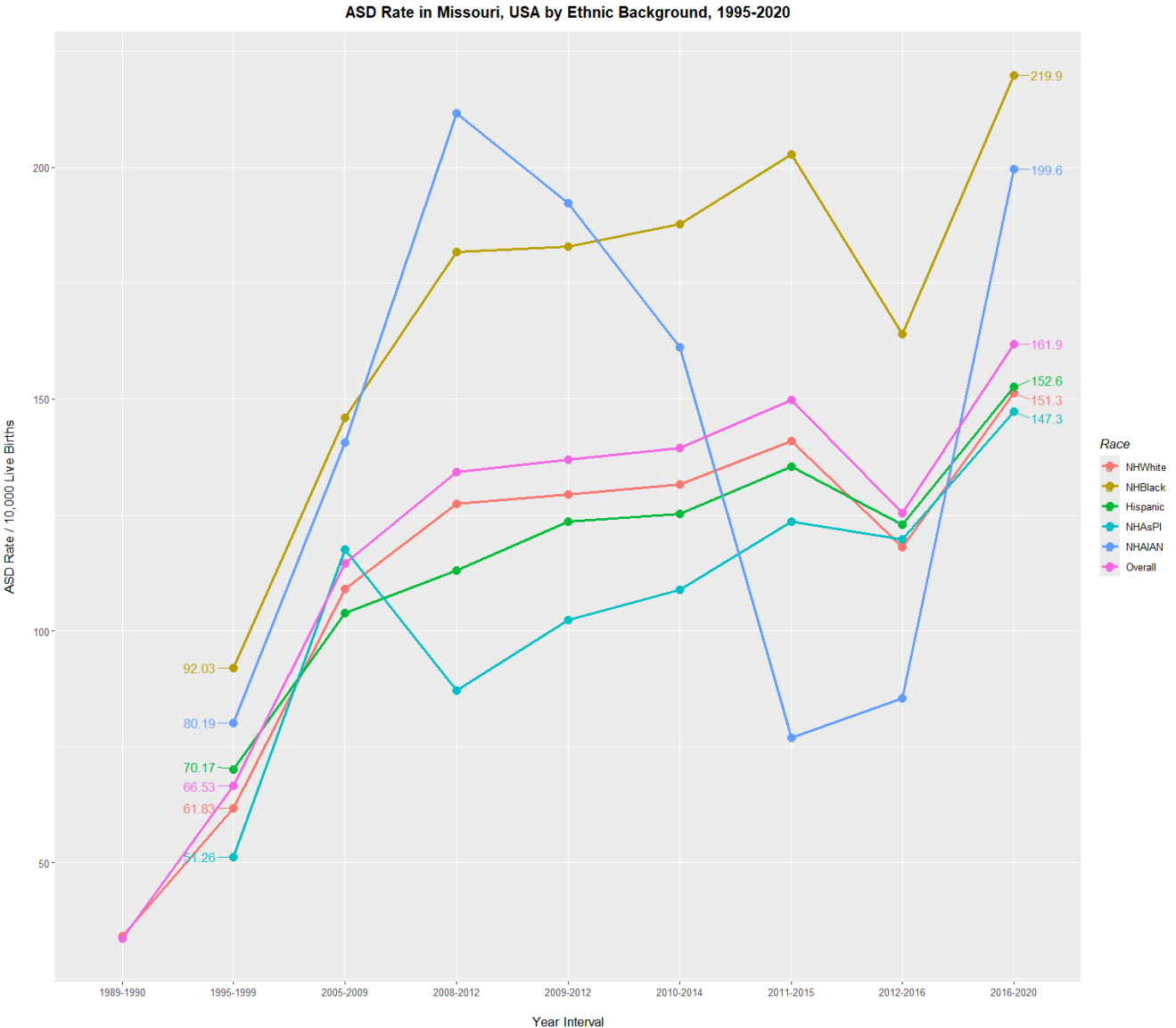


Figure S15.: ASD Rates in New Mexico by Ethnicity

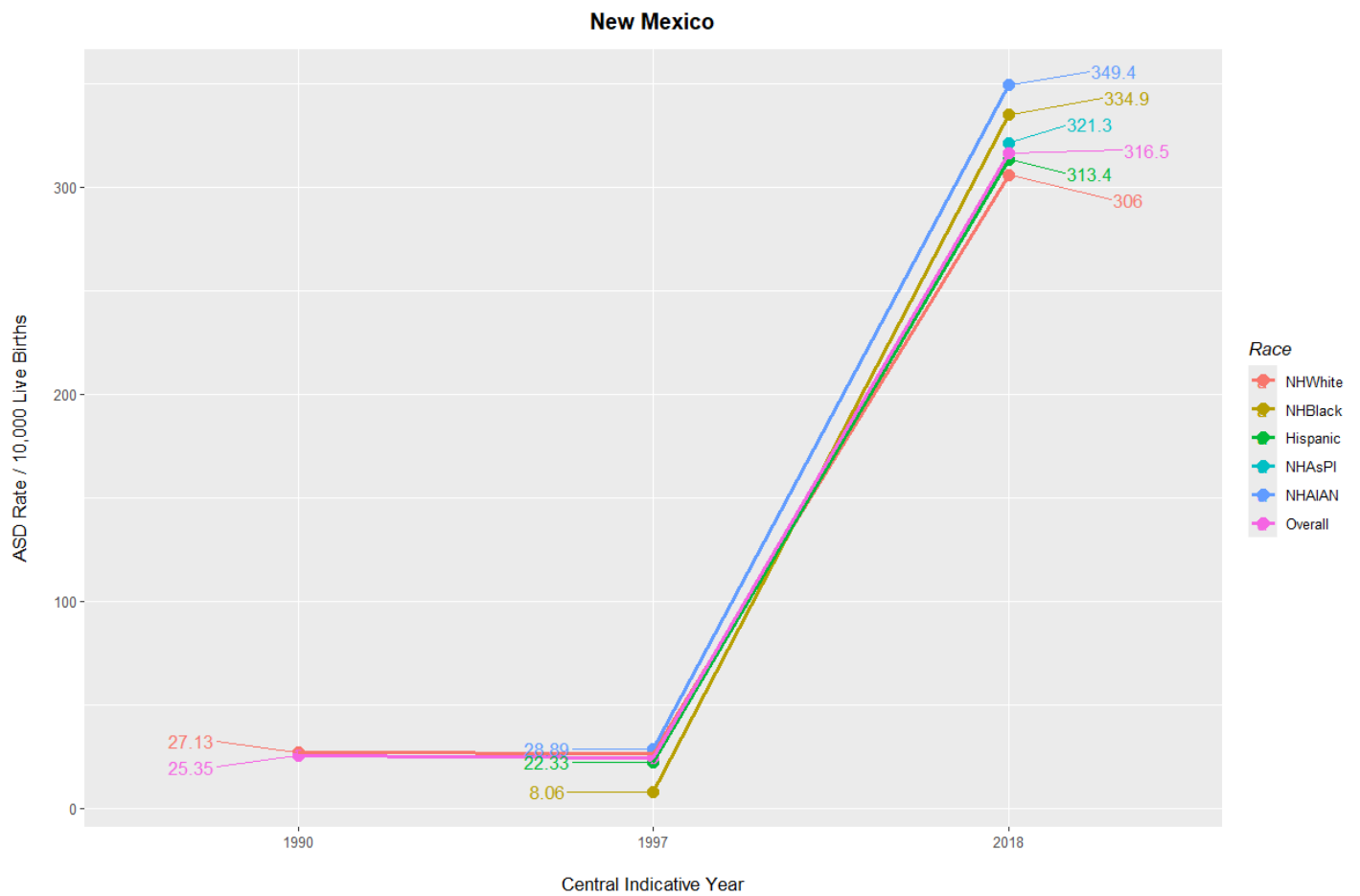


Figure S16.: ASD Rates in Oregon by Ethnicity

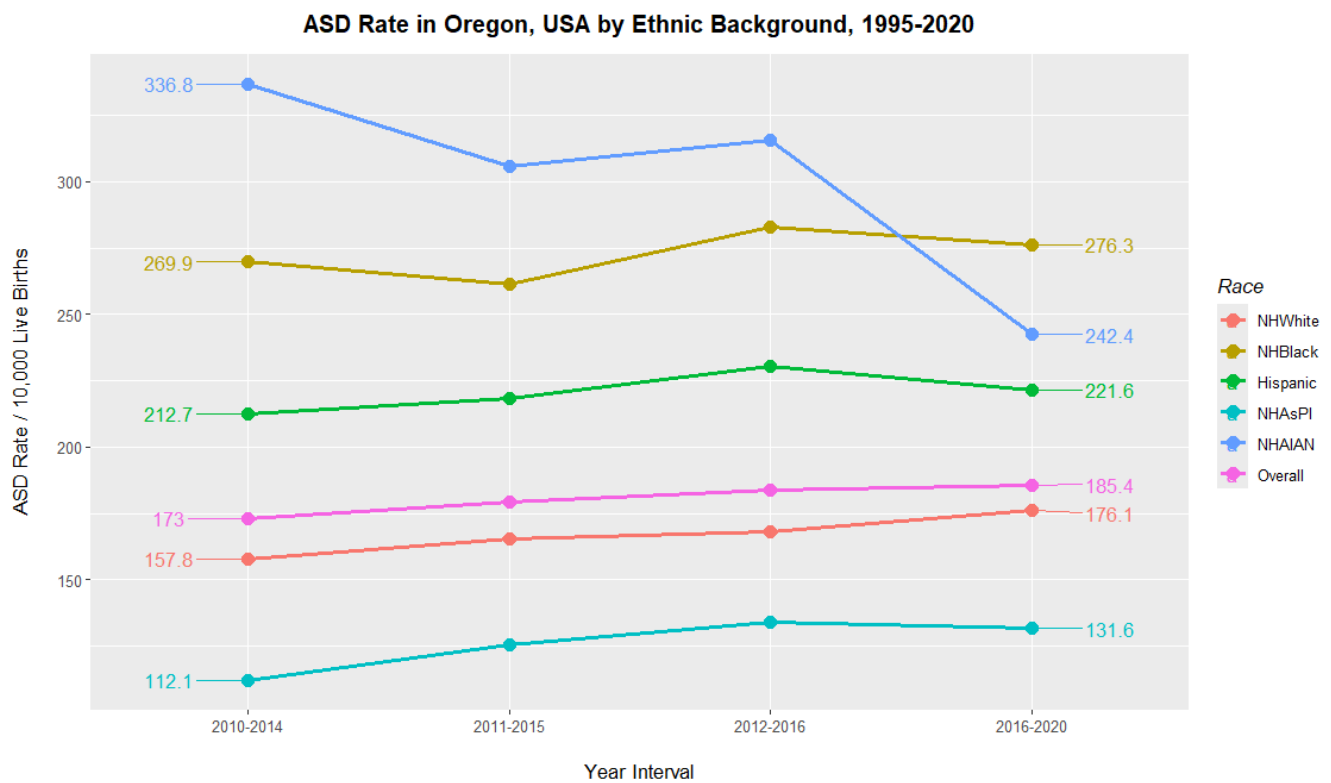


Figure S17.: ASD Rates in Florida by Ethnicity

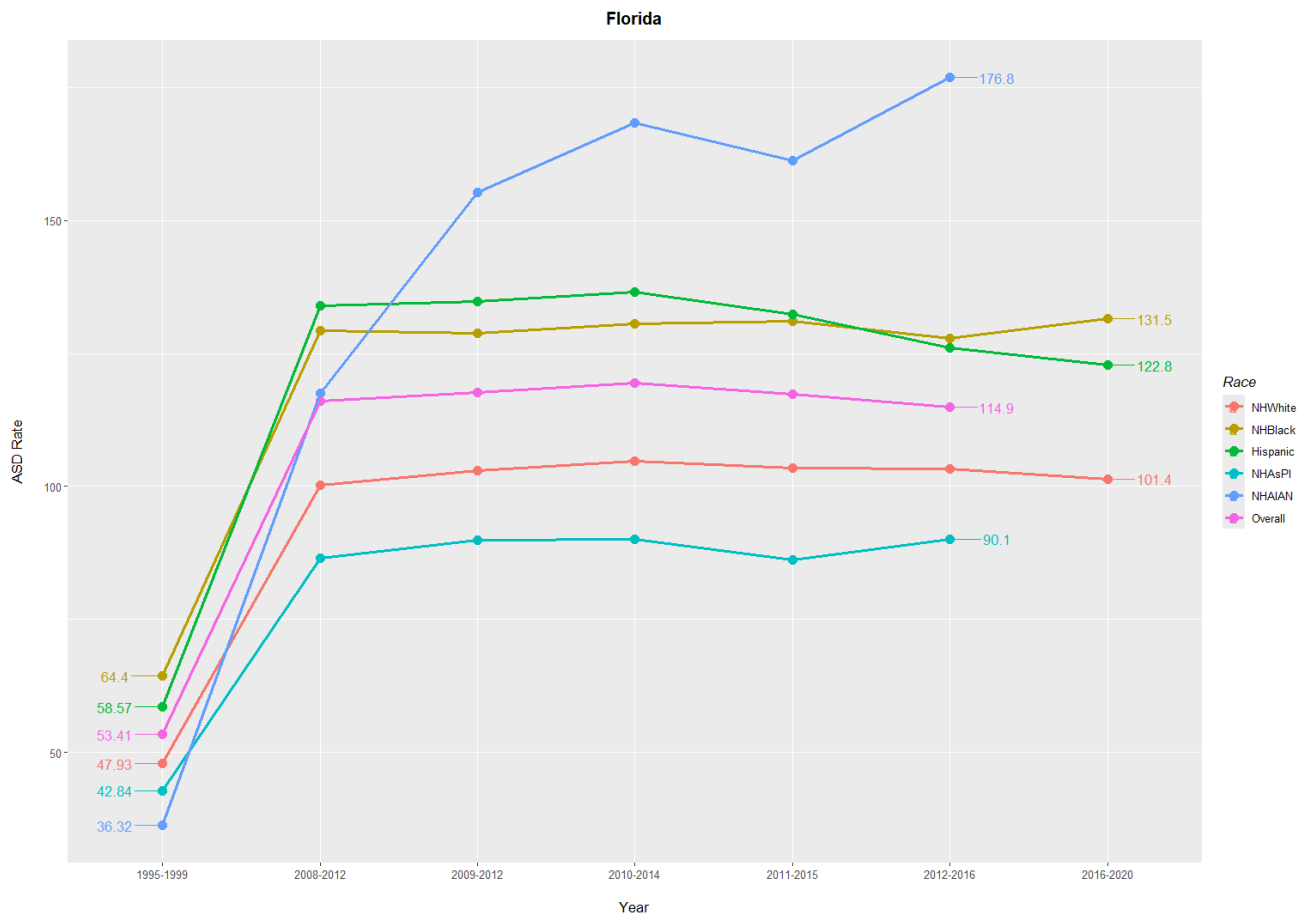


Figure S18.: ASD Rates in Utah by Ethnicity

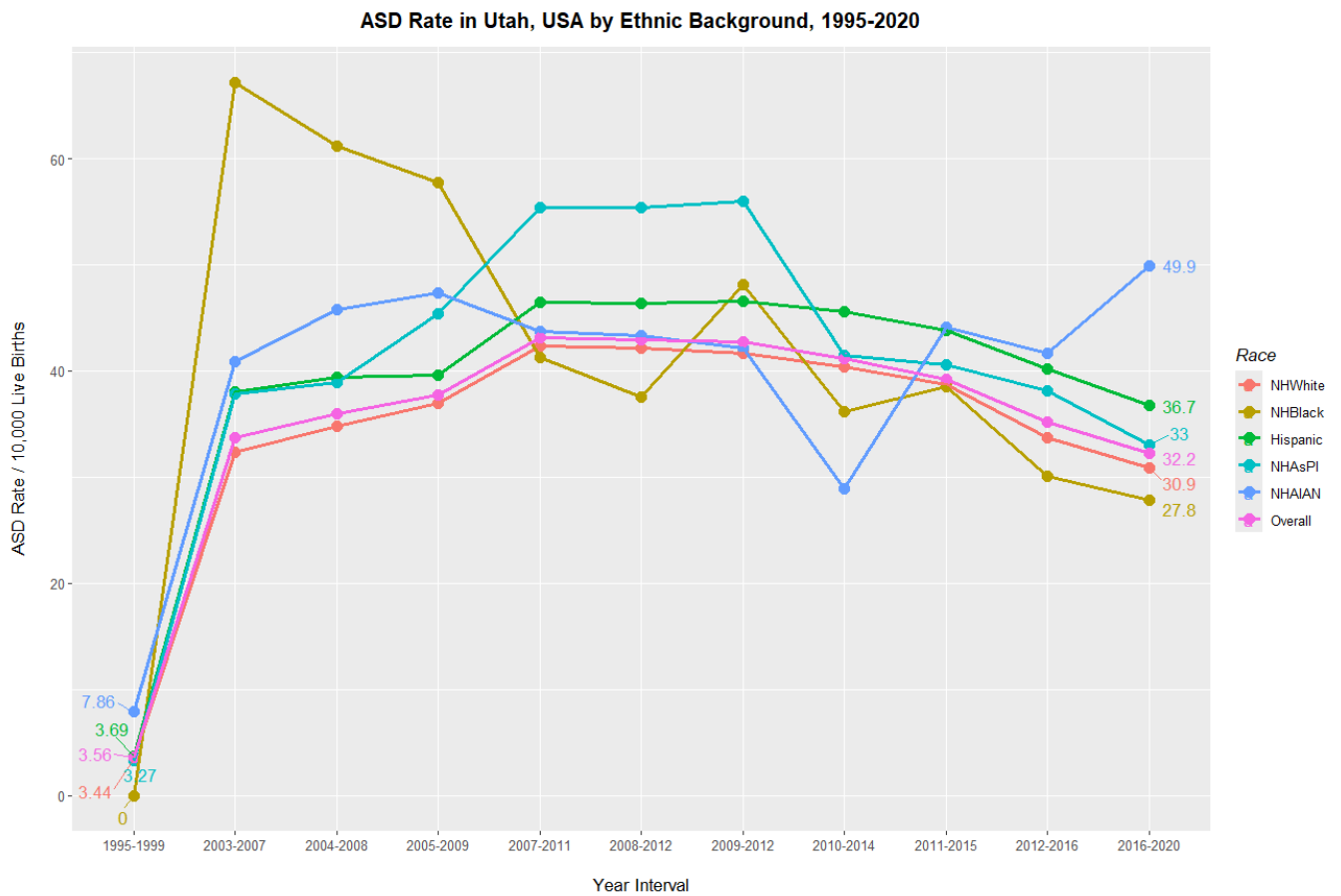


Figure S19.: ASD Rates in Texas by Ethnicity

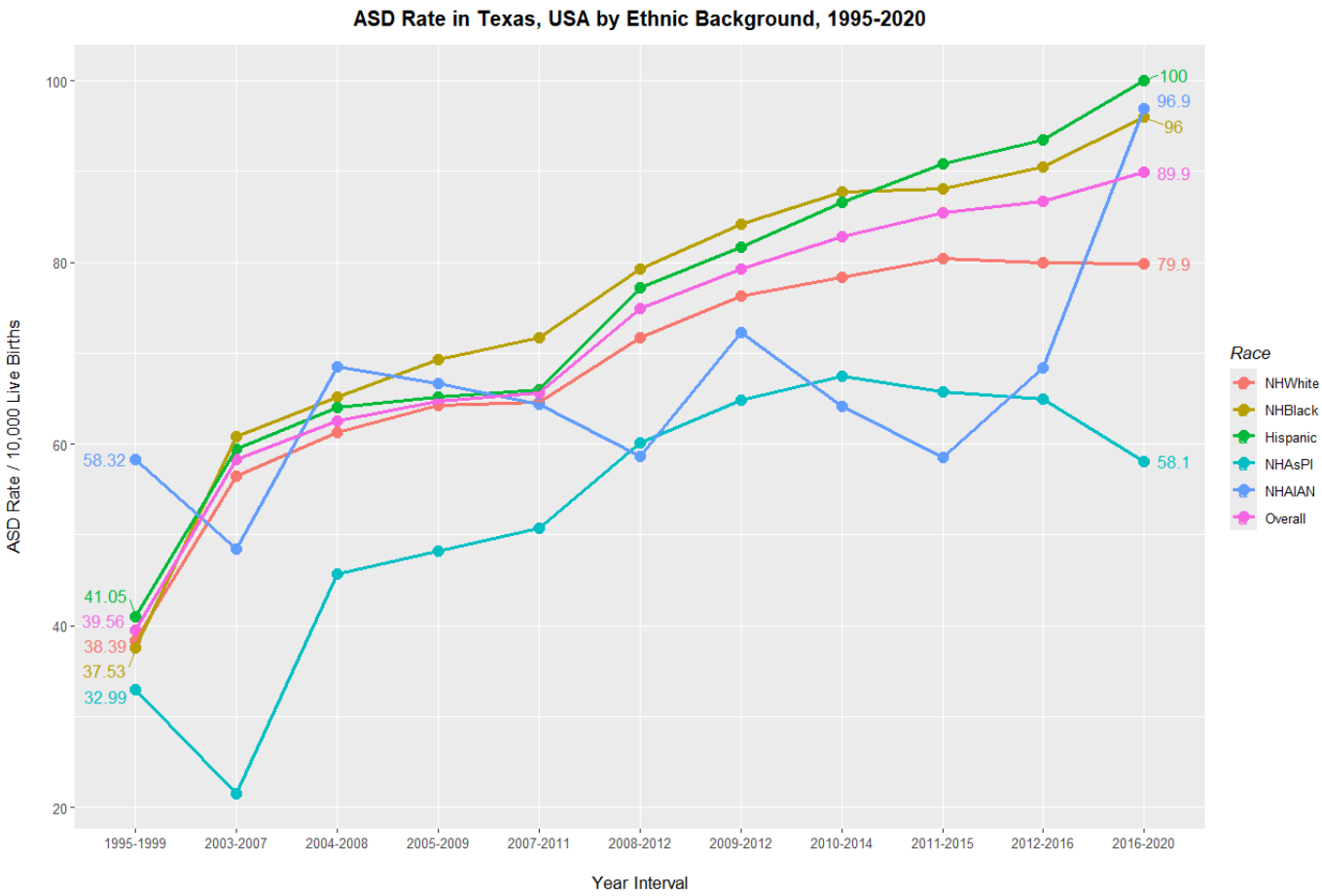


Figure S20.: ASD Rates in Georgia by Ethnicity

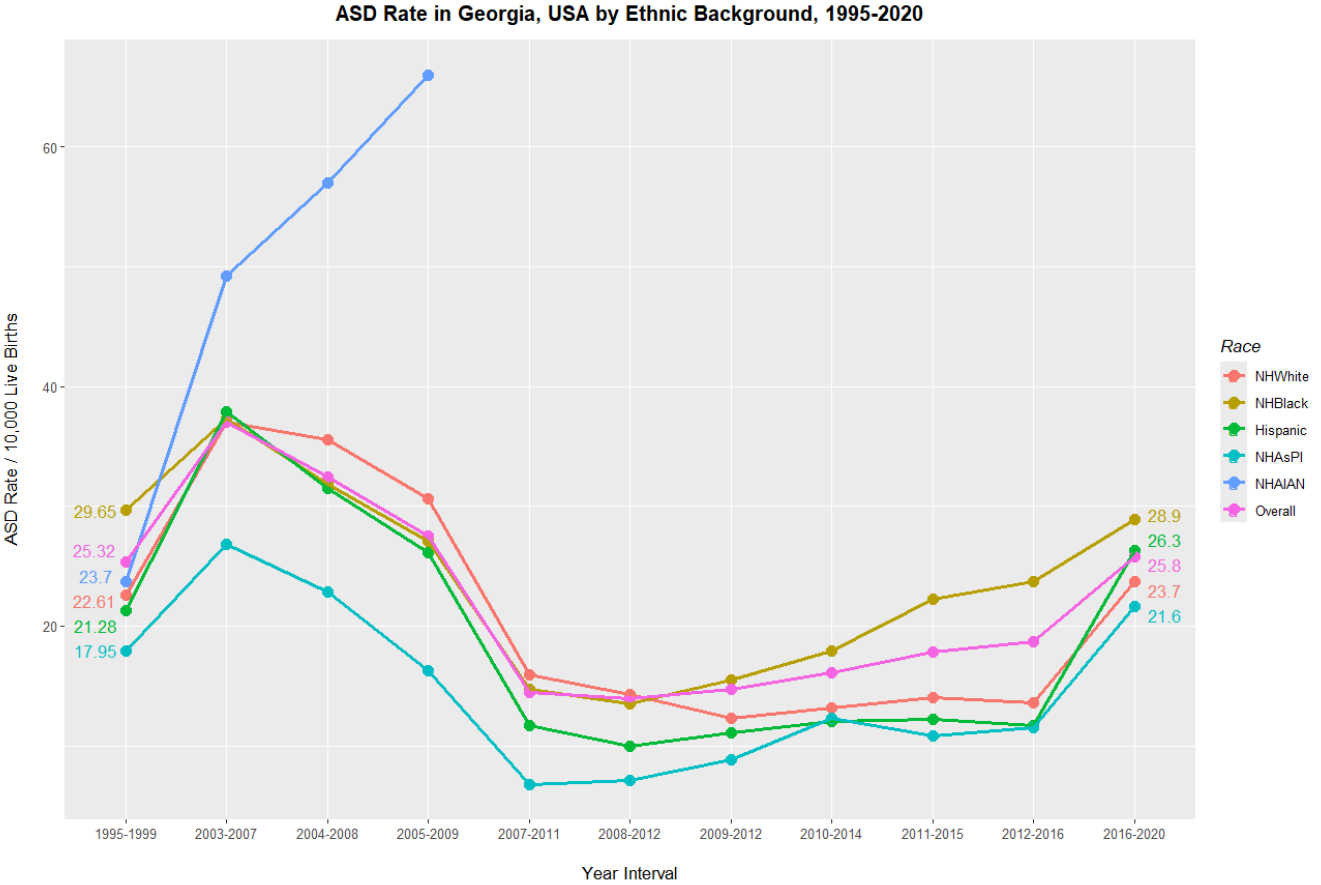


Figure S21.: ASD Rates in Maryland by Ethnicity

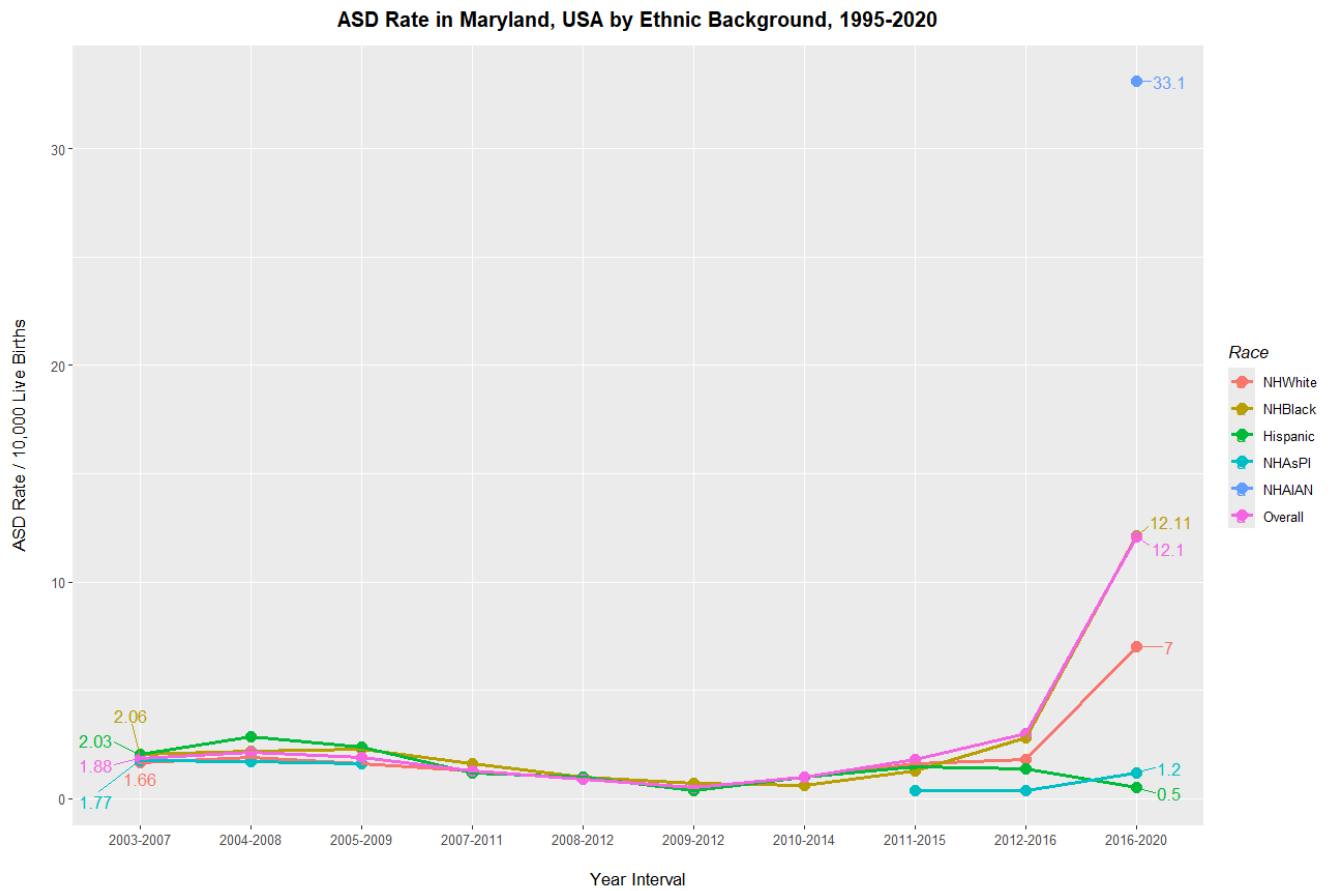


Figure S22.: ASD Rates in Minnesota by Ethnicity

ASD Rate in Minnesota, USA by Ethnic Background, 2005-2020

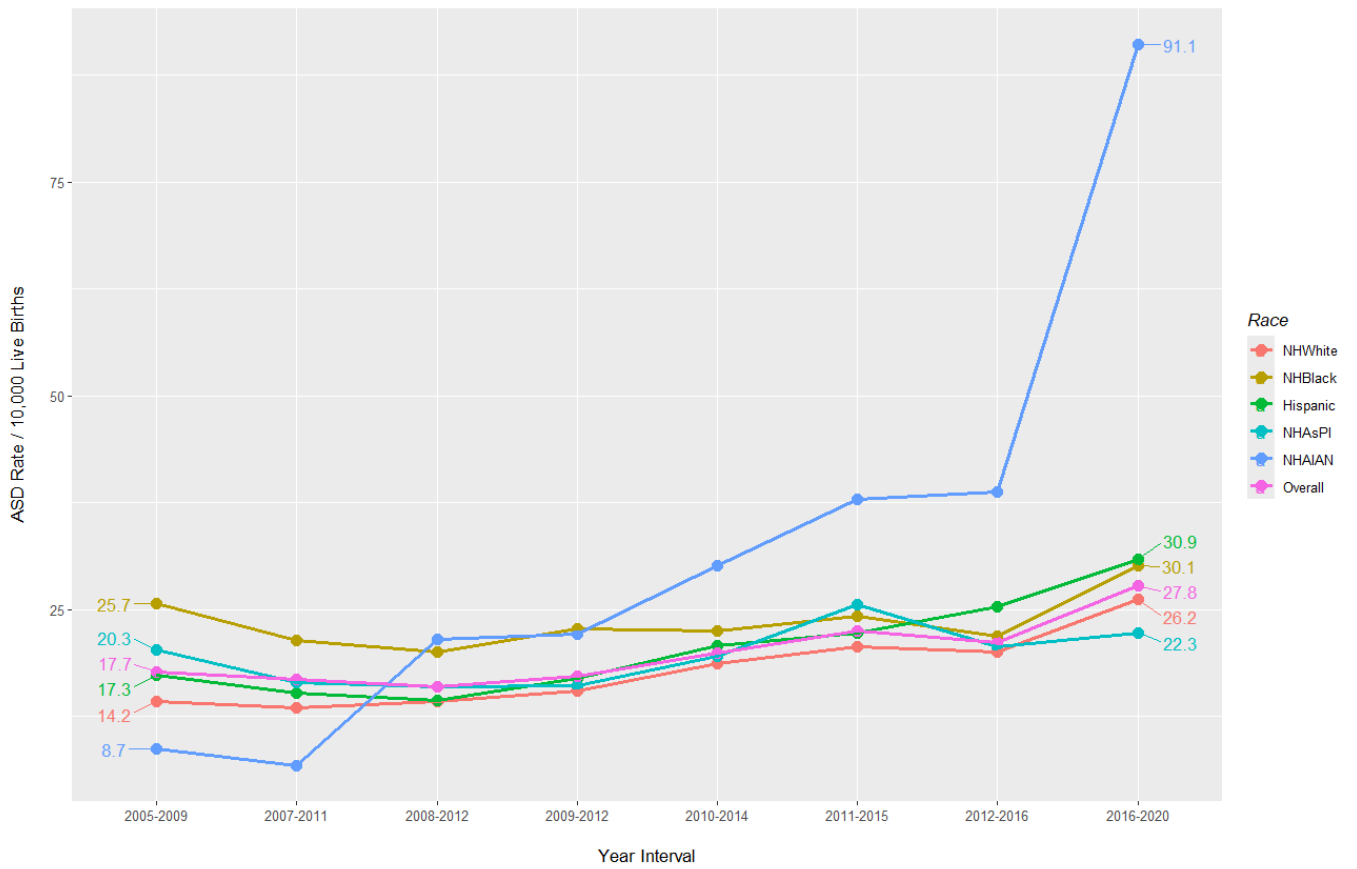


Figure S23.: ASD Rates in Iowa by Ethnicity

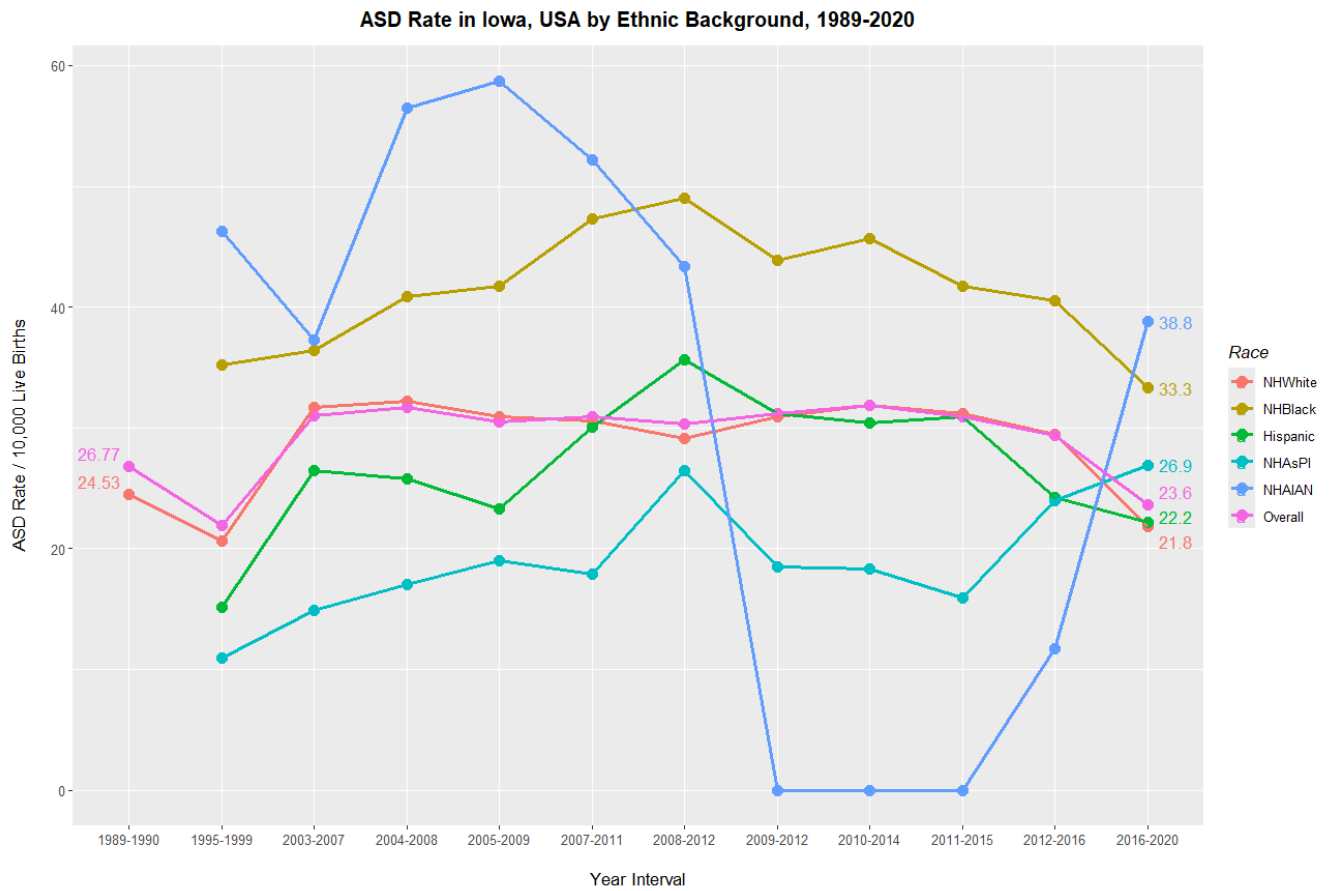


Figure S24.: ASD Rates in South Carolina by Ethnicity

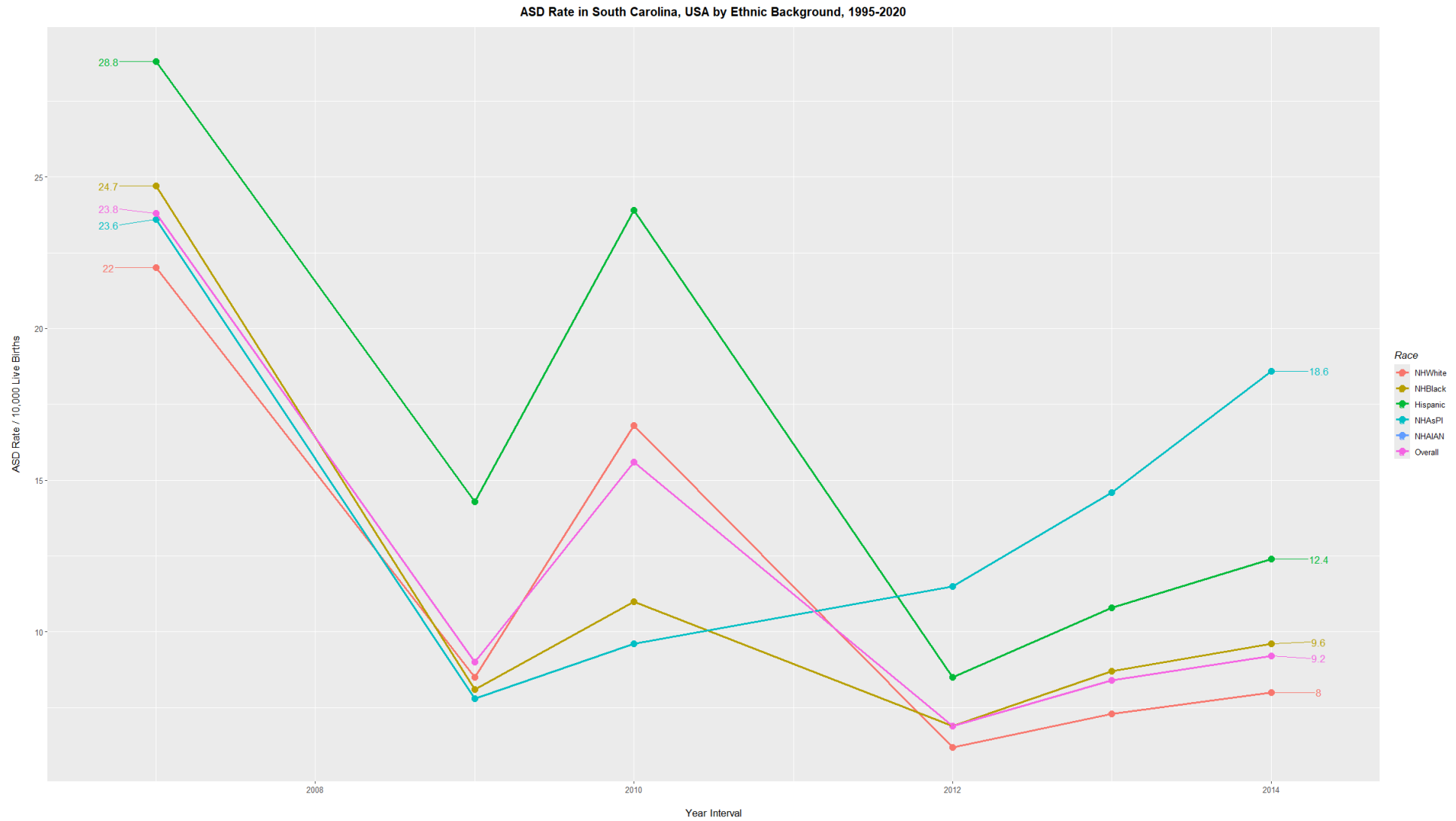


Figure S25.: ASD Rates in New Jersey by Ethnicity

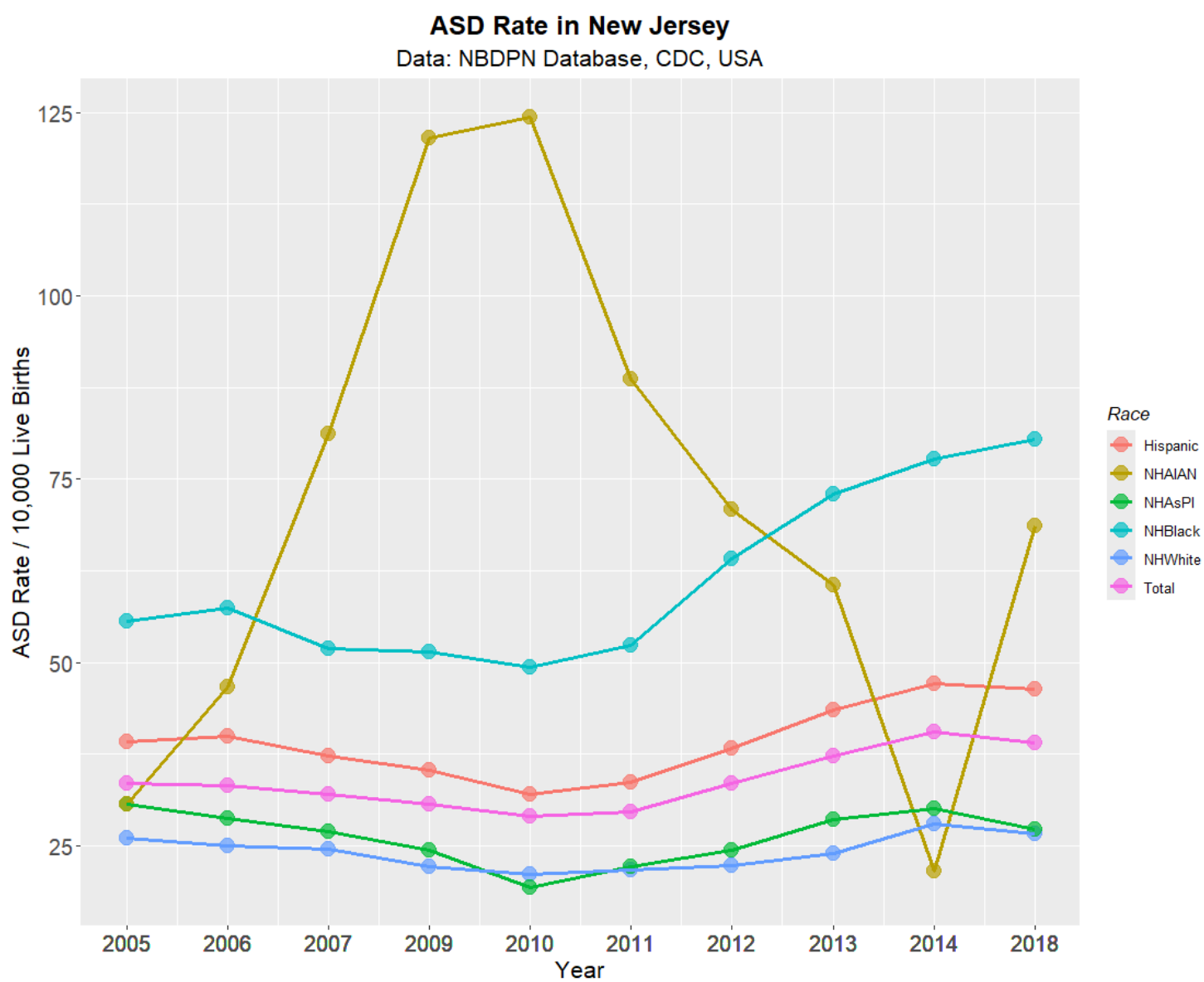


Figure S26.: Rates of Substance Exposure in USA

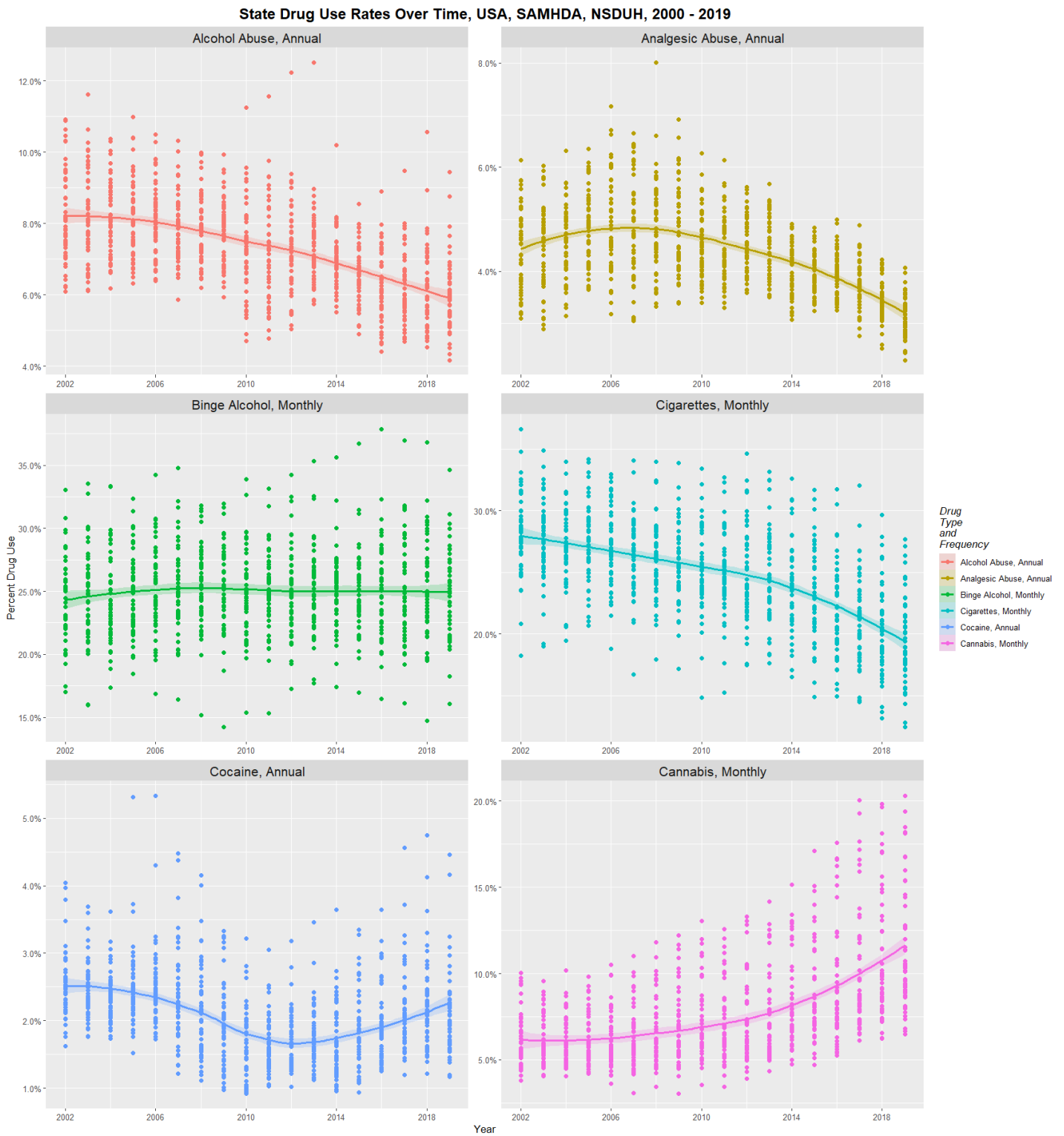


Figure S27.: ASD Rates by Selected Substances, Loess Lines

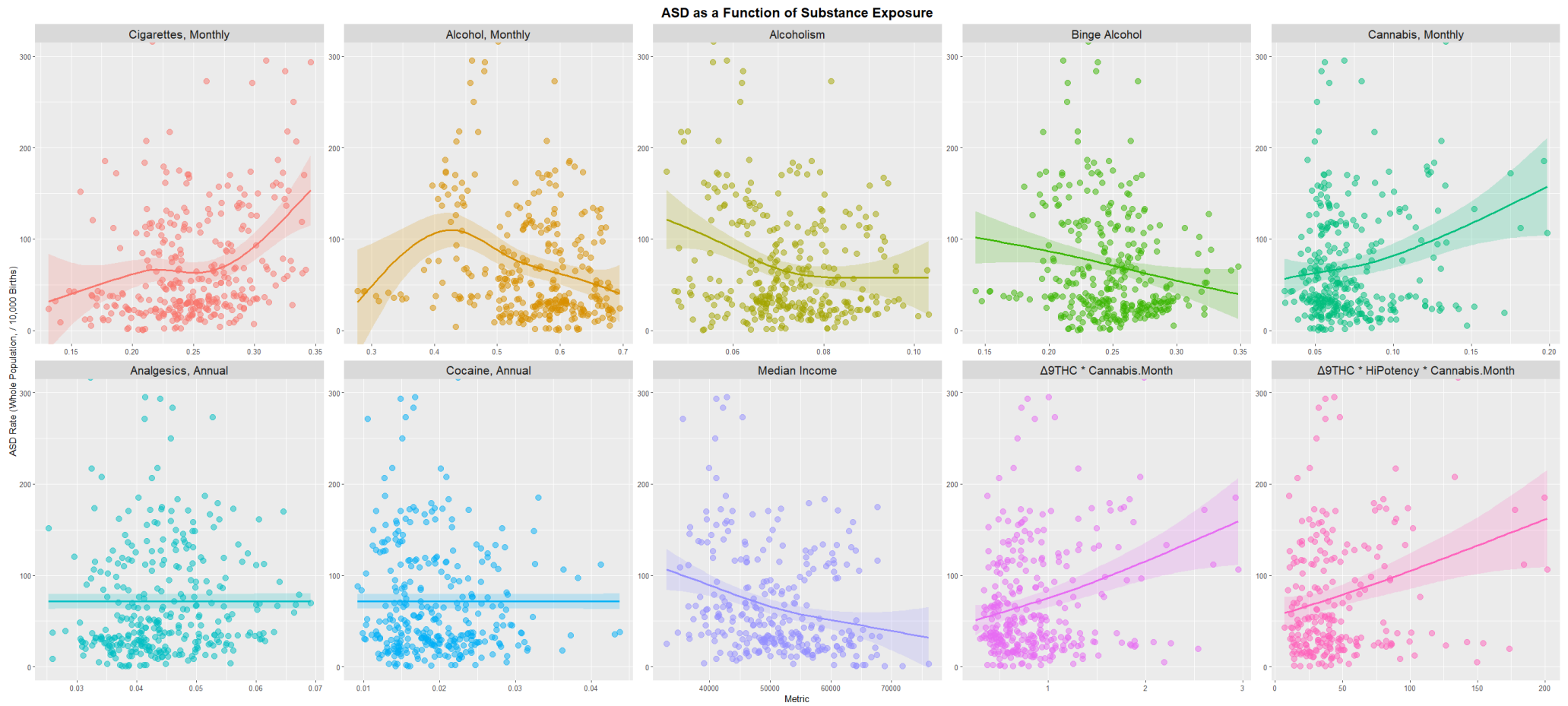


Figure S28.: ASD Rates by Selected Substances, Regression Lines

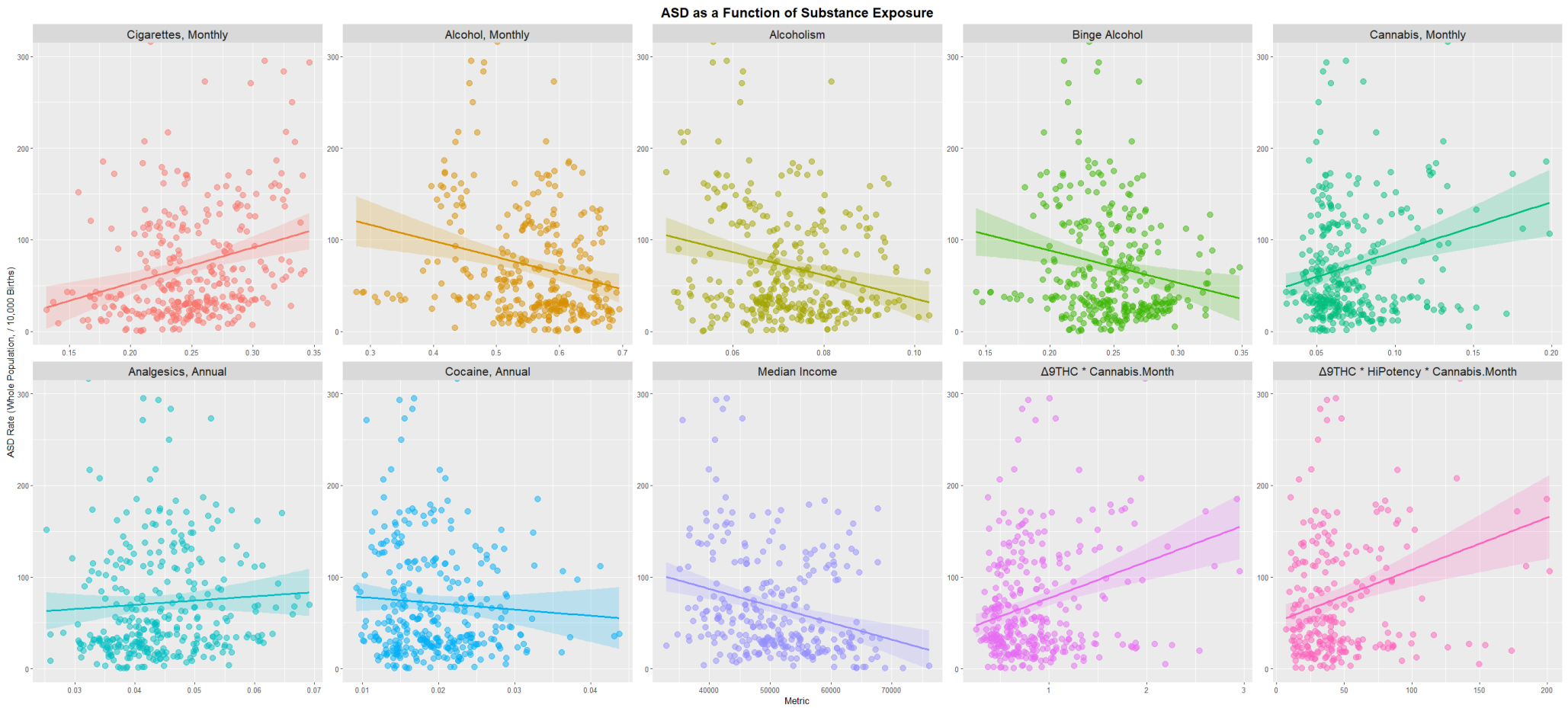


Figure S29.: Log (ASD Rates) by Selected Substances, Regression Lines

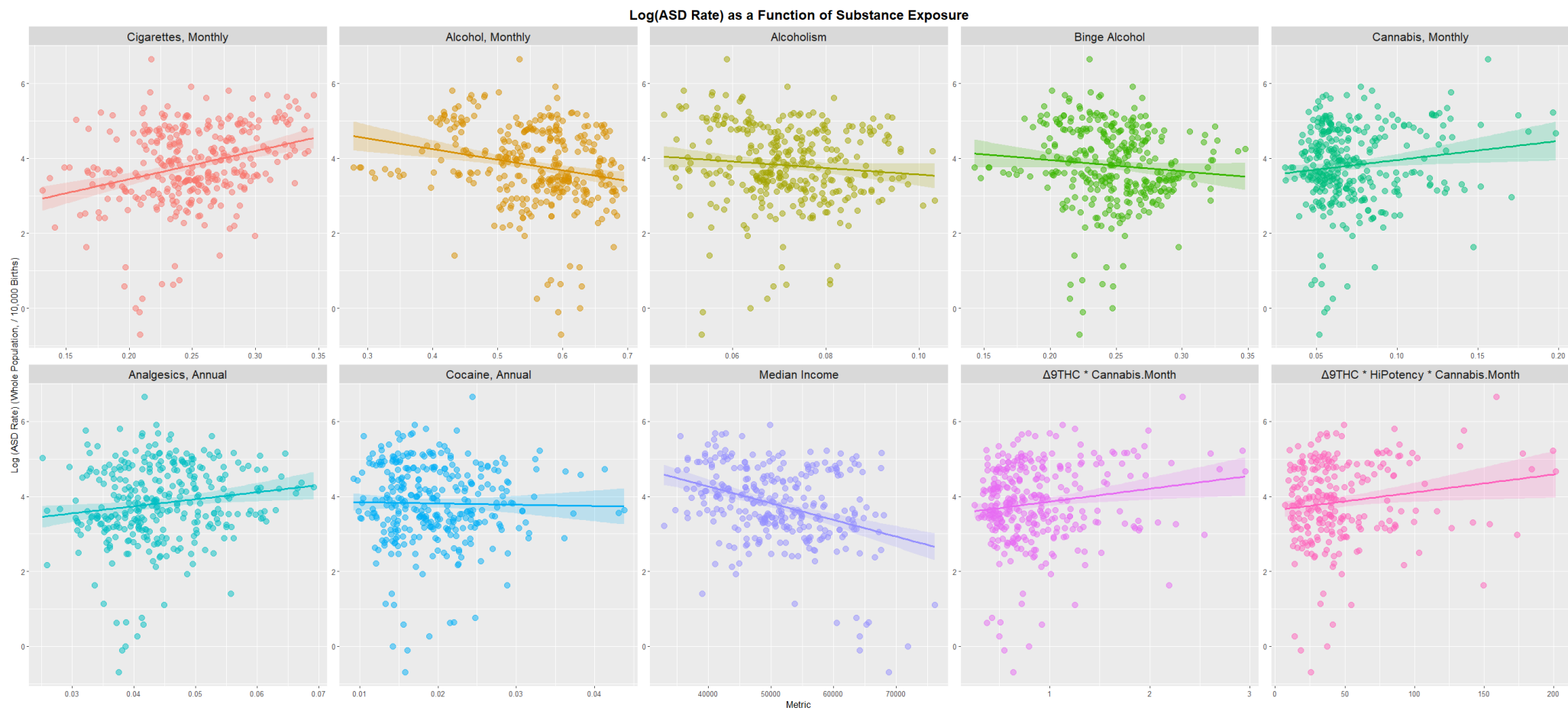


Figure S30.: Cannabinoid Exposure Trends Across USA

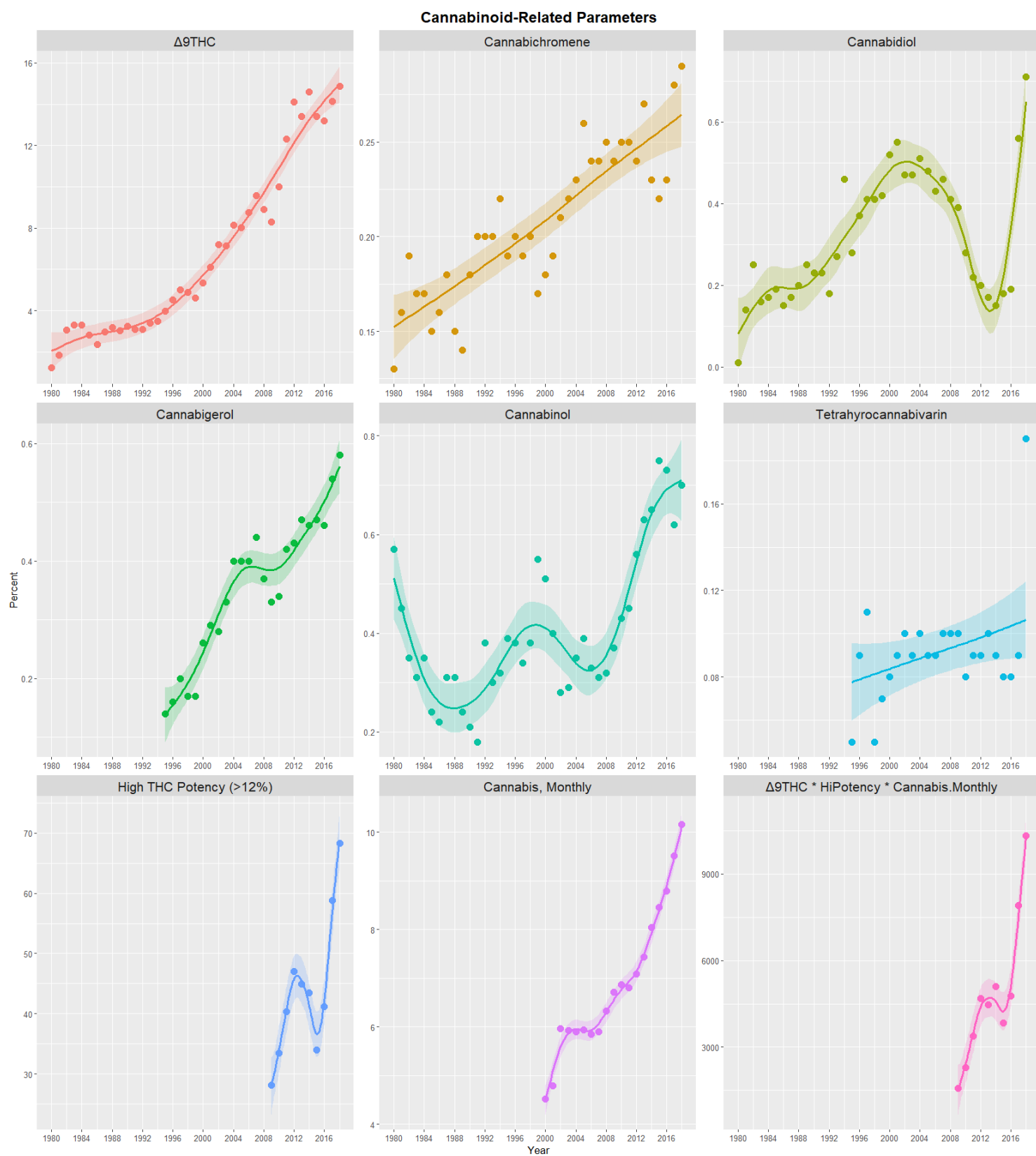


Figure S31.: Slopes ASD by Time v ASD by Cannabis Regression lines

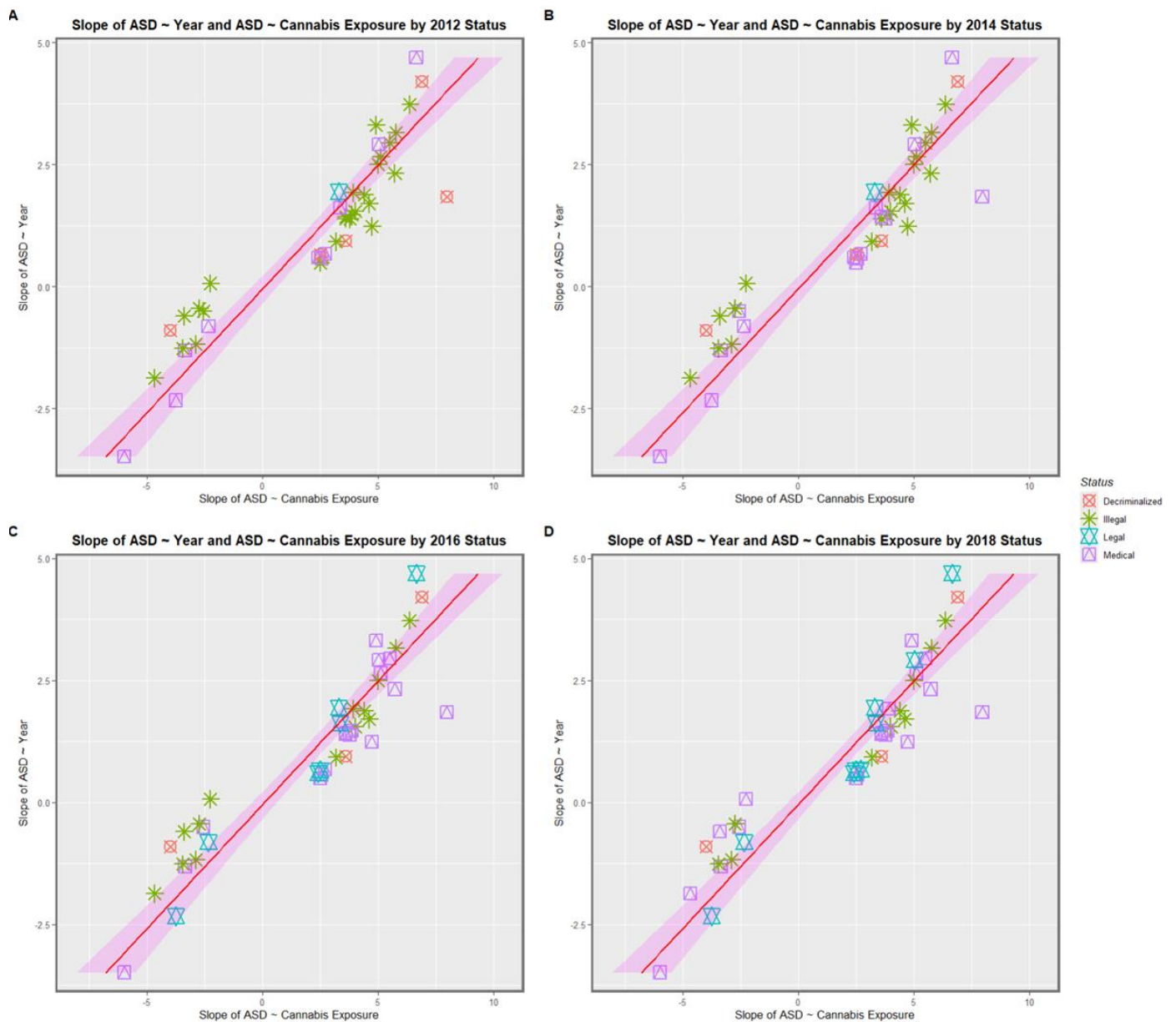


Figure S32.: Variable Importance Plot

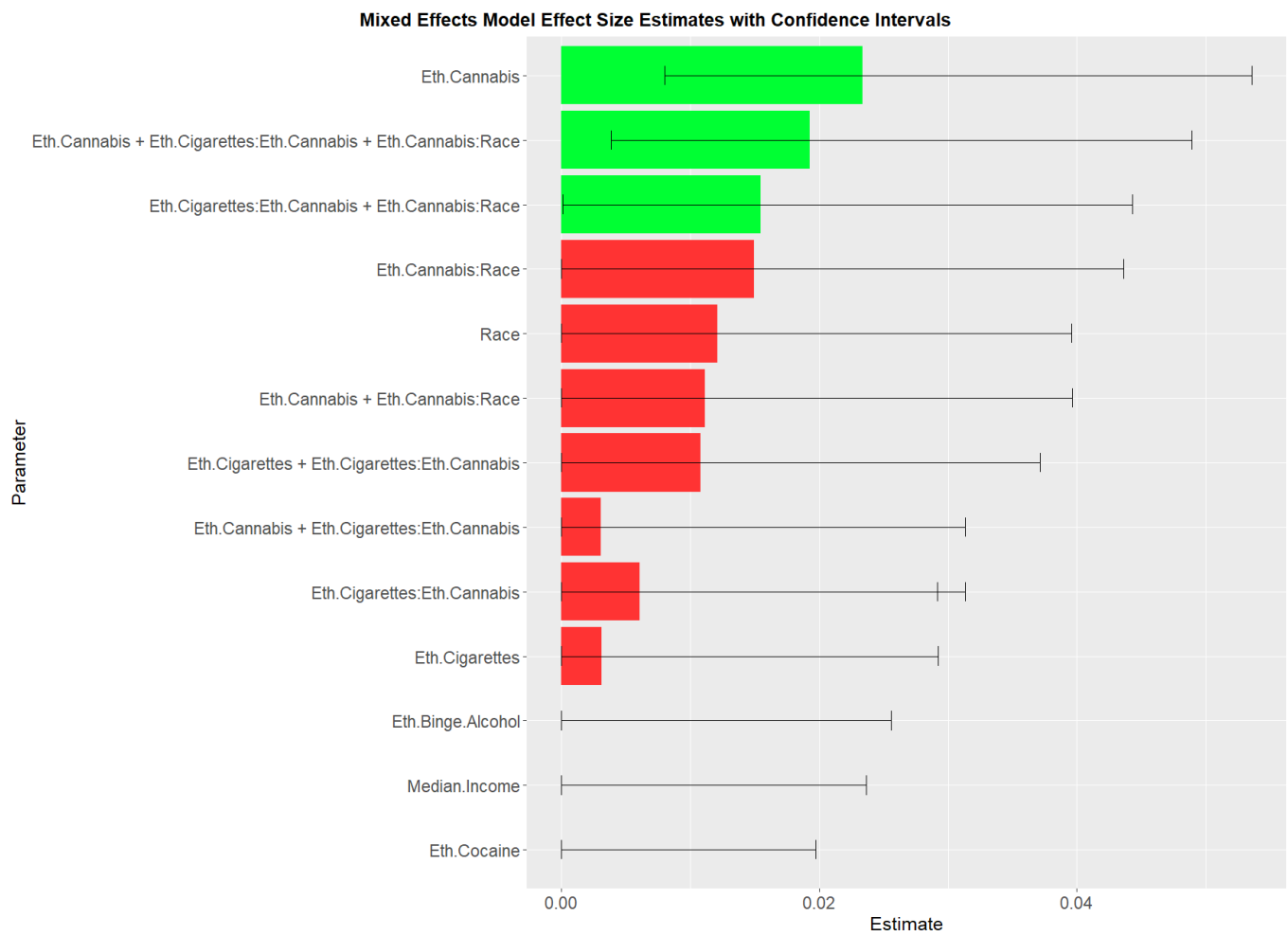


Figure S33.: Trends in Cannabis Legal Status Across USA States

