SUPPLEMENTARY INFORMATION

Genetic Association of Attention-Deficit/Hyperactivity Disorder and Major Depression With Suicidal Ideation and Attempts in Children: The ABCD Study

SUPPLEMENTARY TABLES

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Table S1. Summary of lifetime suicide risk outcome measures. KSADS-5: Kiddie schedule for affective disorders and schizophrenia for diagnostic and statistical manual for mental disorders 5th version. Youth and caregiver reports were used to calculate the number of cases using the listed KSADS-5 items. Total number of the participants was 11,878 for the baseline and 11,235 for the year 1.

Ourcome Measure	Case Numbers (%)				Concordant Case Numbers (Baseline)	ABCD KSADS-5 Items
	Youth Report (KSADS-5)		Parent Report (KSADS-5)			
	Baseline	Year 1	Baseline	Year 1		
Non-Suicidal Self Injury (NSSI)	715 (6.02)	1097 (9.24)	466 (3.92)	NA	110	ksads_23_945_t
						ksads_23_956_t
Suicide Attempts (SA)	156 (1.31)	257 (2.16)	52 (0.44)	NA	14	ksads_23_952_t
						ksads_23_953_t
						ksads_23_954_t
						ksads_23_963_t
						ksads_23_964_t
						ksads_23_965_t
Suicidal Ideation (SI)	1025 (8.63)	1604 (13.50)	891 (7.50)	NA	255	ksads_23_946_t
						ksads_23_947_t
						ksads_23_948_t
						ksads_23_949_t
						ksads_23_950_t
						ksads_23_951_t
						ksads_23_957_t
						ksads_23_958_t
						ksads_23_959_t
						ksads_23_960_t
						ksads_23_961_t
						ksads_23_962_t

Table S2. Summary of eight psychiatric disorder GWAS datasets. ASD: autism spectrum disorder; ANX: anxiety disorder; ANO: anorexia nervosa; BIP: bipolar disorder; MD: major depression; SCZ: schizophrenia disorder

Disorder	# Cases	# Controls	# All Study Samples	Pubmed ID	Download Source
ADHD	19,099	34,194	53,293	30478444	https://doi.org/10.6084/m9.figshare.14671965
ASD	18,381	27,969	46,350	30804558	https://doi.org/10.6084/m9.figshare.14671989
ANX	NA	NA	175,163	31906708	https://doi.org/10.6084/m9.figshare.14102594
ANO	16,992	55,525	72,517	31308545	https://doi.org/10.6084/m9.figshare.14671980
BIP	41,917	371,549	413,466	31043756	https://doi.org/10.6084/m9.figshare.14102594
MD	170,756	329,443	500,199	30718901	https://datashare.ed.ac.uk/handle/10283/3203
PTSD	23,212	151,447	174,659	31594949	https://doi.org/10.6084/m9.figshare.14672133
SCZ	40,675	64,643	105,318	29483656	https://doi.org/10.6084/m9.figshare.14681220

Table S3. Comparison of the full cohort and the genetics sample of European ancestry. To assess distinct characteristics of suicide risk factors between the two groups, we used Welch's two-sample t-test for quantitative measures and proportion tests for categorial variables in R (v4.0.5).

Variable	N (Full Cohort)	N (Genetics Cohort)	mean (Full Cohort)	sd (Full Cohort)	mean (Genetics Cohort)	sd (Genetics Cohort)	test	statistic	p.value
Sex	11878	4344	0.38	NA	0.36	NA	prop.test	2.16	1.41E-01
Age			118.98	7.38	119.30	7.50	t.test	-2.42	1.55E-02
Family history of suicide			0.36	NA	0.41	NA	prop.test	17.28	3.23E-05
parental.education			0.04	NA	0.13	NA	prop.test	1107.24	2.05E-238
marital.status			0.20	NA	0.45	NA	prop.test	666.21	6.66E-147
household.income			0.16	NA	0.37	NA	prop.test	1080.34	2.55E-235
poverty			0.42	NA	0.09	NA	prop.test	621.32	3.86E-137
CBCL Total Problem T-score			45.85	10.66	46.09	11.34	t.test	-1.23	2.20E-01

Table S4. Comparison of the case groups identified from the full cohort and from the genetic sample with respect to demographic, socioeconomic, and child psychopathology measures. Cases include samples with SI and/or SA. To assess distinct characteristics of suicide risk factors between the two groups, we used Welch's two-sample t-test for quantitative measures and proportion tests for categorial variables in R (v4.0.5).

variable	Case # (Full Cohort)	Case # (Genetics Cohort)	mean (Full)	mean (Genetics Cohort)	test	statistic	p.value
Age	1040	376	9.91	9.89	t.test	0.43	6.64E-01
Sex			0.37	0.35	prop.test	0.11	7.45E-01
CBCL Total Problem score			51.21	52.09	t.test	-1.30	1.92E-01
family suicide history			0.35	0.41	prop.test	2.51	1.13E-01
parental.education			0.09	0.18	prop.test	52.19	1.26E-10
marital.status			0.25	0.43	prop.test	31.54	1.96E-08
household.income			0.23	0.37	prop.test	41.55	9.48E-10
poverty			0.40	0.13	prop.test	39.33	3.57E-10

Table S5. Results of logistic regression analysis for eight psychiatric disorder PRSs on the youth-report-based lifetime suicide risk outcome measures. To examine association of PRSs and lifetime suicide risk, we used multiple logistic regression *glm* in R. Each outcome measure was used as a binary dependent variable, while PRS was used as a predictor variable along with age, sex, ten principal components of genetic ancestry as covariates. To measure the unique proportion of variance explained by PRSs, we calculated *Nagelkerke*'s pseudo-R^2.Associations with FDR q less than 0.05 are highlighted in bold.

PRS	PHENO	Event	Subject_No	Case_No	Case_Ratio	R2_DIFF	Estimate	SE	statistics	OR	L95	H95	Pvalue	cor.Pvalue	FDR q
ADHD	NSSI	baseline	4344	256	0.06	0.06%	0.06	0.06	0.98	1.07	0.94	1.21	3.26E-01	1.00E+00	5.74E-01
	NSSI	year1	4212	394	0.09	0.36%	0.14	0.05	2.63	1.15	1.04	1.28	8.50E-03	4.08E-01	5.83E-02
	SA	baseline	4344	37	0.01	0.32%	0.19	0.17	1.13	1.21	0.87	1.67	2.60E-01	1.00E+00	5.22E-01
	SA	**year1**	**4212**	**71**	**0.02**	**1.52%**	**0.38**	**0.12**	**3.15**	**1.47**	**1.16**	**1.86**	**1.61E-03**	**7.73E-02**	**1.64E-02**
	SI	**baseline**	**4344**	**367**	**0.08**	**0.42%**	**0.16**	**0.06**	**2.82**	**1.17**	**1.05**	**1.3**	**4.75E-03**	**2.28E-01**	**3.80E-02**
	SI	**year1**	**4212**	**546**	**0.13**	**0.87%**	**0.21**	**0.05**	**4.41**	**1.23**	**1.12**	**1.34**	**1.01E-05**	**4.85E-04**	**4.85E-04**
ANO	NSSI	baseline	4344	256	0.06	0.07%	0.07	0.07	1.07	1.07	0.94	1.22	2.83E-01	1.00E+00	5.22E-01
	NSSI	year1	4212	394	0.09	0.10%	0.08	0.05	1.42	1.08	0.97	1.2	1.57E-01	1.00E+00	4.43E-01
	SA	baseline	4344	37	0.01	0.29%	0.18	0.17	1.09	1.2	0.87	1.66	2.78E-01	1.00E+00	5.22E-01
	SA	year1	4212	71	0.02	0.19%	0.13	0.12	1.11	1.14	0.9	1.45	2.67E-01	1.00E+00	5.22E-01
	SI	baseline	4344	367	0.08	0.06%	-0.06	0.05	-1.09	0.94	0.85	1.05	2.78E-01	1.00E+00	5.22E-01
	SI	year1	4212	546	0.13	0.01%	-0.03	0.05	-0.56	0.97	0.89	1.07	5.73E-01	1.00E+00	7.43E-01
ANX	NSSI	baseline	4344	256	0.06	0.00%	0.01	0.06	0.11	1.01	0.89	1.14	9.12E-01	1.00E+00	9.12E-01
	NSSI	year1	4212	394	0.09	0.14%	0.09	0.05	1.67	1.09	0.98	1.21	9.53E-02	1.00E+00	3.52E-01
	SA	baseline	4344	37	0.01	0.01%	0.04	0.17	0.24	1.04	0.75	1.44	8.11E-01	1.00E+00	8.65E-01
	SA	year1	4212	71	0.02	0.06%	-0.08	0.12	-0.62	0.93	0.73	1.17	5.33E-01	1.00E+00	7.43E-01
	SI	baseline	4344	367	0.08	0.01%	-0.02	0.05	-0.34	0.98	0.88	1.09	7.31E-01	1.00E+00	8.35E-01
	SI	year1	4212	546	0.13	0.00%	0.01	0.05	0.27	1.01	0.93	1.11	7.83E-01	1.00E+00	8.65E-01
ASD	NSSI	baseline	4344	256	0.06	0.10%	0.08	0.06	1.25	1.08	0.96	1.23	2.10E-01	1.00E+00	4.89E-01
	NSSI	year1	4212	394	0.09	0.22%	0.11	0.05	2.06	1.12	1.01	1.24	3.92E-02	1.00E+00	1.71E-01
	SA	baseline	4344	37	0.01	0.12%	0.11	0.17	0.69	1.12	0.81	1.55	4.91E-01	1.00E+00	7.37E-01
	SA	year1	4212	71	0.02	0.05%	0.07	0.12	0.58	1.07	0.85	1.36	5.61E-01	1.00E+00	7.43E-01
	SI	baseline	4344	367	0.08	0.09%	0.07	0.05	1.29	1.07	0.96	1.19	1.96E-01	1.00E+00	4.89E-01
	SI	year1	4212	546	0.13	0.22%	0.1	0.05	2.21	1.11	1.01	1.21	2.70E-02	1.00E+00	1.44E-01
BIP	NSSI	baseline	4344	256	0.06	0.01%	0.02	0.07	0.38	1.02	0.9	1.16	7.07E-01	1.00E+00	8.35E-01
	NSSI	year1	4212	394	0.09	0.11%	0.08	0.05	1.47	1.08	0.97	1.2	1.41E-01	1.00E+00	4.43E-01
	SA	baseline	4344	37	0.01	0.03%	0.06	0.17	0.37	1.06	0.77	1.48	7.10E-01	1.00E+00	8.35E-01
	SA	year1	4212	71	0.02	0.31%	0.17	0.12	1.43	1.19	0.94	1.51	1.54E-01	1.00E+00	4.43E-01
	SI	baseline	4344	367	0.08	0.00%	-0.01	0.05	-0.13	0.99	0.89	1.11	8.99E-01	1.00E+00	9.12E-01
	SI	year1	4212	546	0.13	0.00%	0.01	0.05	0.25	1.01	0.92	1.11	8.04E-01	1.00E+00	8.65E-01
MD	NSSI	baseline	4344	256	0.06	0.13%	0.09	0.06	1.43	1.1	0.97	1.24	1.53E-01	1.00E+00	4.43E-01
	NSSI	year1	4212	394	0.09	0.34%	0.14	0.05	2.57	1.15	1.03	1.27	1.02E-02	4.90E-01	6.12E-02
	SA	**baseline**	**4344**	**37**	**0.01**	**3.30%**	**0.62**	**0.17**	**3.6**	**1.85**	**1.32**	**2.6**	**3.21E-04**	**1.54E-02**	**5.14E-03**
	SA	**year1**	**4212**	**71**	**0.02**	**2.45%**	**0.49**	**0.12**	**3.98**	**1.63**	**1.28**	**2.08**	**6.95E-05**	**3.34E-03**	**1.67E-03**
	SI	baseline	4344	367	0.08	0.24%	0.12	0.05	2.13	1.12	1.01	1.25	3.31E-02	1.00E+00	1.59E-01
	SI	**year1**	**4212**	**546**	**0.13**	**0.44%**	**0.15**	**0.05**	**3.14**	**1.16**	**1.06**	**1.27**	**1.71E-03**	**8.21E-02**	**1.64E-02**
PTSD	NSSI	baseline	4344	256	0.06	0.04%	0.05	0.07	0.76	1.05	0.92	1.2	4.45E-01	1.00E+00	6.89E-01
	NSSI	year1	4212	394	0.09	0.08%	0.07	0.05	1.25	1.07	0.96	1.19	2.12E-01	1.00E+00	4.89E-01
	SA	baseline	4344	37	0.01	0.01%	-0.03	0.17	-0.18	0.97	0.7	1.34	8.61E-01	1.00E+00	8.98E-01
	SA	year1	4212	71	0.02	0.11%	0.1	0.12	0.84	1.11	0.87	1.4	3.99E-01	1.00E+00	6.60E-01
	SI	baseline	4344	367	0.08	0.01%	0.02	0.06	0.35	1.02	0.92	1.14	7.26E-01	1.00E+00	8.35E-01
	SI	year1	4212	546	0.13	0.07%	0.06	0.05	1.24	1.06	0.97	1.16	2.14E-01	1.00E+00	4.89E-01
SCZ	NSSI	baseline	4344	256	0.06	0.04%	0.05	0.07	0.77	1.05	0.93	1.2	4.41E-01	1.00E+00	6.89E-01
	NSSI	year1	4212	394	0.09	0.02%	0.03	0.05	0.63	1.03	0.93	1.15	5.31E-01	1.00E+00	7.43E-01
	SA	baseline	4344	37	0.01	0.79%	0.3	0.17	1.79	1.35	0.97	1.87	7.34E-02	1.00E+00	2.94E-01
	SA	year1	4212	71	0.02	0.14%	0.12	0.12	0.96	1.12	0.89	1.43	3.35E-01	1.00E+00	5.74E-01
	SI	baseline	4344	367	0.08	0.02%	-0.03	0.06	-0.59	0.97	0.87	1.08	5.53E-01	1.00E+00	7.43E-01
	SI	year1	4212	546	0.13	0.01%	-0.02	0.05	-0.5	0.98	0.89	1.07	6.20E-01	1.00E+00	7.83E-01

Table S6. Results of logistic regression analysis that includes both ADHD and major depression PRSs as predictors. Each outcome measure was used as a binary dependent variable, while depression and ADHD PRSs were used as independent variables along with age, sex, ten principal components of genetic ancestry as covariates. To measure the unique proportion of variance explained by PRSs, we calculated *Nagelkerke*'s pseudo-R^2. MD: major depression, SA: suicide attempts, SI: suicidal ideation. Estimate1, Std_Err1, and Pvalue1 are the effect estimate, standard error, and p-value for ADHD, while Estimate2, Std_Err2, and Pvalue2 are the effect estimate, standard error, and p-value for MD. R2_DIFF_m3vsm1 means the difference of the Nagelkerke's R^2 for the model with and without two PRSs.

PRS1	PRS2	PHENO	Event	Subject_No	Case_No	Case_Ratio	R2_DIFF_m3vsm1	Estimate1	Std_Error1	Pvalue1	Estimate2	Std_Error2	Pvalue2
ADHD	MD	SA	baseline	4344	37	0.009	3.09E-02	0.10	0.17	5.38E-01	0.60	0.17	5.10E-04
ADHD	MD		year 1	4212	71	0.017	1.99E-02	0.32	0.12	9.20E-03	0.44	0.12	3.64E-04
ADHD	MD	SI	baseline	4344	367	0.084	1.61E-03	0.14	0.06	1.09E-02	0.10	0.06	8.07E-02
ADHD	MD		year 1	4212	545	0.129	2.99E-03	0.19	0.05	5.36E-05	0.12	0.05	9.64E-03

Table S7. Results of logistic regression analysis for eight psychiatric disorder PRSs on the parent-report-based lifetime suicide risk outcome measures. To examine association of PRSs and lifetime suicide risk, we used multiple logistic regression *glm* in R. Each outcome measure was used as a binary dependent variable, while PRS was used as a predictor variable along with age, sex, ten principal components of genetic ancestry as covariates. To measure the unique proportion of variance explained by PRSs, we calculated *Nagelkerke*'s pseudo-R^2. NSSI: non-suicidal self-injury, SA: suicide attempts, SI: suicidal ideation. adhd: attention-deficits hyperactivity disorder, ano: anorexia nervosa, anx: general anxiety disorder, asd: autism spectrum disorder, bip: bipolar disorder, mdd: major depression, ptsd: post-traumatic stress disorder, scz: schizophrenia. Estimate, SE, and Pvalue are the effect estimate, standard error, and p-value for the corresponding PRS. OR is the exponential of the estimate, and L95 and H95 denotes the 95% confidence intervals for the OR estimate. R2_DIFF refers the difference of the Nagelkerke's R^2 for the model with and without a PRS.

Event	PHENO	PRS	Subject_No	Case_No	Case_Ratio	R2_DIFF	Estimate	SE	statistics	OR	L95	H95	Pvalue	FDR q	Bonf.P
baseline	NSSI	adhd	4344	176	0.041	0.039%	-0.05	0.08	-0.70	0.95	0.81	1.10	4.86E-01	9.01E-01	1.00E+00
		ano	4344	176	0.041	0.265%	-0.14	0.08	-1.81	0.87	0.75	1.01	6.96E-02	3.34E-01	1.00E+00
		anx	4344	176	0.041	0.015%	0.03	0.08	0.43	1.03	0.89	1.20	6.65E-01	9.01E-01	1.00E+00
		asd	4344	176	0.041	0.015%	-0.03	0.08	-0.42	0.97	0.83	1.13	6.71E-01	9.01E-01	1.00E+00
		bip	4344	176	0.041	0.006%	-0.02	0.08	-0.27	0.98	0.84	1.14	7.84E-01	9.01E-01	1.00E+00
		mdd	4344	176	0.041	0.036%	-0.05	0.08	-0.67	0.95	0.82	1.10	5.05E-01	9.01E-01	1.00E+00
		ptsd	4344	176	0.041	0.007%	0.02	0.08	0.29	1.02	0.88	1.19	7.75E-01	9.01E-01	1.00E+00
		scz	4344	176	0.041	0.044%	0.06	0.08	0.74	1.06	0.91	1.24	4.58E-01	9.01E-01	1.00E+00
	SA	adhd	4344	16	0.004	0.017%	-0.05	0.25	-0.18	0.96	0.59	1.56	8.57E-01	9.01E-01	1.00E+00
		ano	4344	16	0.004	0.001%	0.01	0.25	0.04	1.01	0.62	1.65	9.70E-01	9.70E-01	1.00E+00
		anx	4344	16	0.004	0.197%	0.15	0.25	0.62	1.16	0.72	1.89	5.38E-01	9.01E-01	1.00E+00
		asd	4344	16	0.004	0.042%	0.07	0.26	0.28	1.08	0.65	1.77	7.76E-01	9.01E-01	1.00E+00
		bip	4344	16	0.004	4.733%	-0.77	0.26	-2.97	0.46	0.28	0.77	2.93E-03	7.03E-02	7.03E-02
		mdd	4344	16	0.004	2.228%	-0.53	0.26	-2.05	0.59	0.35	0.98	4.06E-02	2.44E-01	9.75E-01
		ptsd	4344	16	0.004	0.628%	-0.28	0.25	-1.10	0.76	0.46	1.24	2.73E-01	7.73E-01	1.00E+00
		scz	4344	16	0.004	0.049%	-0.08	0.26	-0.31	0.92	0.56	1.53	7.60E-01	9.01E-01	1.00E+00
	SI	adhd	4344	319	0.073	0.355%	-0.15	0.06	-2.51	0.86	0.77	0.97	1.22E-02	1.46E-01	2.94E-01
		ano	4344	319	0.073	0.017%	-0.03	0.06	-0.54	0.97	0.86	1.09	5.89E-01	9.01E-01	1.00E+00
		anx	4344	319	0.073	0.004%	0.01	0.06	0.25	1.01	0.90	1.14	8.01E-01	9.01E-01	1.00E+00
		asd	4344	319	0.073	0.111%	-0.08	0.06	-1.40	0.92	0.82	1.03	1.61E-01	5.52E-01	1.00E+00
		bip	4344	319	0.073	0.118%	-0.08	0.06	-1.44	0.92	0.82	1.03	1.49E-01	5.52E-01	1.00E+00
		mdd	4344	319	0.073	0.063%	0.06	0.06	1.06	1.06	0.95	1.19	2.90E-01	7.73E-01	1.00E+00
		ptsd	4344	319	0.073	0.249%	0.12	0.06	2.09	1.13	1.01	1.27	3.64E-02	2.44E-01	8.73E-01
		scz	4344	319	0.073	0.002%	-0.01	0.06	-0.17	0.99	0.88	1.11	8.63E-01	9.01E-01	1.00E+00

Table S8. Partial correlation between PRSs and CBCL measures. To examine association of PRSs with child psychopathology, we calculated partial correlation between the two, adjusting for ancestry principal components, using the R *ppcor* package. Along with Pearson correlation estimates, t-score statistics were used to represent a standardized relationship of the two variables.

PRS	EVENT	CBCL Variable	estimate	statistic	p.value	cor.p
ADHD	baseline (N=4,344)	cbcl_scr_syn_aggressive_t	0.08	4.97	7.01E-07	3.08E-05
		cbcl_scr_syn_anxdep_t	0.03	1.78	7.44E-02	1.00E+00
		cbcl_scr_syn_attention_t	0.09	5.91	3.77E-09	1.66E-07
		cbcl_scr_syn_external_t	0.09	6.21	5.90E-10	2.60E-08
		cbcl_scr_syn_internal_t	0.04	2.61	9.00E-03	3.96E-01
		cbcl_scr_syn_rulebreak_t	0.09	5.61	2.11E-08	9.27E-07
		cbcl_scr_syn_social_t	0.06	3.90	9.60E-05	4.22E-03
		cbcl_scr_syn_somatic_t	0.05	3.58	3.43E-04	1.51E-02
		cbcl_scr_syn_thought_t	0.06	3.67	2.43E-04	1.07E-02
		cbcl_scr_syn_totprob_t	0.08	5.55	3.07E-08	1.35E-06
		cbcl_scr_syn_withdep_t	0.04	2.42	1.56E-02	6.88E-01
	year1 (N=4212)	cbcl_scr_syn_aggressive_t	0.08	5.31	1.15E-07	5.05E-06
		cbcl_scr_syn_anxdep_t	0.04	2.44	1.49E-02	6.56E-01
		cbcl_scr_syn_attention_t	0.10	6.66	3.08E-11	1.35E-09
		cbcl_scr_syn_external_t	0.10	6.72	2.12E-11	9.31E-10
		cbcl_scr_syn_internal_t	0.06	3.64	2.80E-04	1.23E-02
		cbcl_scr_syn_rulebreak_t	0.11	6.82	1.07E-11	4.70E-10
		cbcl_scr_syn_social_t	0.07	4.22	2.48E-05	1.09E-03
		cbcl_scr_syn_somatic_t	0.06	3.79	1.53E-04	6.71E-03
		cbcl_scr_syn_thought_t	0.07	4.73	2.28E-06	1.01E-04
		cbcl_scr_syn_totprob_t	0.10	6.57	5.82E-11	2.56E-09
		cbcl_scr_syn_withdep_t	0.05	3.07	2.17E-03	9.56E-02
MD	baseline (N=4,344)	cbcl_scr_syn_aggressive_t	0.07	4.75	2.07E-06	9.09E-05
		cbcl_scr_syn_anxdep_t	0.07	4.84	1.35E-06	5.95E-05
		cbcl_scr_syn_attention_t	0.06	3.71	2.14E-04	9.41E-03
		cbcl_scr_syn_external_t	0.09	6.25	4.41E-10	1.94E-08
		cbcl_scr_syn_internal_t	0.09	5.61	2.09E-08	9.21E-07
		cbcl_scr_syn_rulebreak_t	0.08	5.48	4.53E-08	1.99E-06
		cbcl_scr_syn_social_t	0.08	4.99	6.26E-07	2.75E-05
		cbcl_scr_syn_somatic_t	0.08	5.45	5.46E-08	2.40E-06
		cbcl_scr_syn_thought_t	0.07	4.32	1.57E-05	6.89E-04
		cbcl_scr_syn_totprob_t	0.10	6.43	1.46E-10	6.43E-09
		cbcl_scr_syn_withdep_t	0.06	3.98	7.12E-05	3.13E-03
	year1 (N=4212)	cbcl_scr_syn_aggressive_t	0.08	5.05	4.67E-07	2.06E-05
		cbcl_scr_syn_anxdep_t	0.07	4.57	5.12E-06	2.25E-04
		cbcl_scr_syn_attention_t	0.07	4.25	2.20E-05	9.70E-04
		cbcl_scr_syn_external_t	0.10	6.31	3.08E-10	1.36E-08
		cbcl_scr_syn_internal_t	0.08	5.11	3.38E-07	1.49E-05
		cbcl_scr_syn_rulebreak_t	0.09	5.58	2.60E-08	1.14E-06
		cbcl_scr_syn_social_t	0.08	5.21	2.03E-07	8.94E-06
		cbcl_scr_syn_somatic_t	0.07	4.35	1.42E-05	6.25E-04
		cbcl_scr_syn_thought_t	0.09	5.62	2.08E-08	9.17E-07
		cbcl_scr_syn_totprob_t	0.10	6.49	9.53E-11	4.19E-09
		cbcl_scr_syn_withdep_t	0.06	3.91	9.27E-05	4.08E-03

Table S9. Multiple logistic regression analysis results of the base and the PRS model. We assessed predictive improvement of PRSs on suicidality independent of known risk factors using two logistic regression models in R. The first model included known risk factors of suicide as independent variables (i.e., base model), while the second model included an additional variable of polygenic risk score (i.e., genetic risk model). In all analyses, we included ten ancestry principal components as covariates to account for potential population sub-stratification. Along with *Nagelkerke*'s pseudo-R^2, the likelihood ratio test was performed to assess whether a genetic risk model significantly improves the prediction of suicidality compared to a base model in R (v4.0.5). SA: suicide attempts, SI: suicidal ideation. ADHD: attention-deficits hyperactivity disorder, MD: major depression. Estimate, Std_Error, and Pvalue are the effect estimate, standard error, and p-value for the corresponding PRS. OR is the exponential of the estimate, and L95 and H95 denotes the 95% confidence intervals for the OR estimate. R2_DIFF refers the difference of the Nagelkerke's R^2 for the model with and without a PRS. Associations with the *p* value less than 0.05 are highlighted in gray.

ASSESSMENT	PHENO	PRS	Subject_No	Case_No	Case_Ratio	CBCL_VARIABLE	R2_DIFF	Estimate	Std_Error	OR	L95	H95	Pvalue
baseline	SA	MD	4344	37	0.009	cbcl_scr_syn_totprob_t	0.0187	0.436	0.175	1.55	1.10	2.18	1.27E-02
year1	SA	MD	4212	71	0.017	cbcl_scr_syn_totprob_t	0.0117	0.324	0.127	1.38	1.08	1.77	1.05E-02
baseline	SI	ADHD	4344	367	0.084	cbcl_scr_syn_totprob_t	0.0013	0.086	0.057	1.09	0.98	1.22	1.30E-01
year1	SI	ADHD	4212	545	0.129	cbcl_scr_syn_totprob_t	0.0039	0.139	0.048	1.15	1.05	1.26	3.71E-03

Table S10. Results of multiple logistic regression analysis that includes both ADHD and major depression PRSs, along with clinical, familial, and sociodemographic risk factors of suicide. Each outcome measure was used as a binary dependent variable, while depression and ADHD PRSs were used as independent variables along with known risk factors of suicide, age, sex, ten principal components of genetic ancestry as covariates. To measure the unique proportion of variance explained by PRSs, we calculated *Nagelkerke*'s pseudo-R^2. Due to space limitation, the wide table is displayed continuously in two sections. SA: suicide attempts, SI: suicidal ideation. ADHD: attention-deficits hyperactivity disorder, MD: major depression. Estimate1, Std_Err1, and Pvalue1 are the effect estimate, standard error, and p-value for the first PRS, while Estimate2, Std_Err2, and Pvalue2 are the effect estimate, standard error, and p-value for the second PRS. R2_DIFF_m2vsm0 refers to the difference of the Nagelkerke's R^2 for the model with and without the second PRS. R2_DIFF_m3vsm0 refers to the difference of the Nagelkerke's R^2 for the model with and without two PRSs. LRtest.p refers to the p-value of the likelihood ratio test between the model including both PRSs and the model including only the first PRS.

baseline	PHENO	PRS1	PRS2	Subject_No	Case_No	Case_Ratio	CBCL_TSCORE	R2_DIFF_m1vsm0
baseline	SA	MD	ADHD	4344	37	0.009	cbcl_scr_syn_totprob_t	0.019
year1	SA	MD	ADHD	4212	71	0.017	cbcl_scr_syn_totprob_t	0.012
year1	SI	ADHD	MD	4212	545	0.129	cbcl_scr_syn_totprob_t	0.004

R2_DIFF_m2vsm0	R2_DIFF_m3vsm0	Beta1	Std_Error1	Pvalue1	Beta2	Std_Error2	Pvalue2	LRtest.p
0.000	0.019	4.44E-01	1.76E-01	1.18E-02	-6.59E-02	1.82E-01	7.17E-01	7.17E-01
0.005	0.015	3.02E-01	1.27E-01	1.78E-02	1.71E-01	1.30E-01	1.86E-01	1.86E-01
0.001	0.005	1.32E-01	4.84E-02	6.51E-03	6.23E-02	4.81E-02	1.96E-01	1.95E-01

Table S11. Sensitivity analysis results of depression and ADHD PRS risk models with respect to ten different p-value thresholds. PRS Threshold refers to the p-value used to generate PRS for each disorder. For example, Pt_5e.08 means SNPs with the p-value $\leq 5x10^{-8}$ from the disorder GWAS were used to calculate the PRS for the study participants in the ABCD. LRtest.p refers to the p-value of the likelihood ratio test between the model with and without the PRS.

PHENO	Event	PRS	Subject No	Case No	Case Ratio	PRS Threshold	CBCL_TSCORE	R2_DIFF	Estimate	Std_Error	statistics	Pvalue	LRtest.p
SA	baseline	MD	4344	37	0.009	Pt_5e.08	no.cbcl	1.30%	0.41	0.19	2.21	2.69E-02	2.19E-02
SA	baseline	MD	4344	37	0.009	Pt_5e.05	no.cbcl	1.19%	0.37	0.17	2.19	2.88E-02	2.81E-02
SA	baseline	MD	4344	37	0.009	Pt_0.005	no.cbcl	2.31%	0.51	0.17	3.04	2.39E-03	2.24E-03
SA	baseline	MD	4344	37	0.009	Pt_0.05	no.cbcl	3.30%	0.62	0.17	3.60	3.21E-04	2.58E-04
SA	baseline	MD	4344	37	0.009	Pt_0.1	no.cbcl	2.58%	0.54	0.17	3.19	1.42E-03	1.24E-03
SA	baseline	MD	4344	37	0.009	Pt_0.2	no.cbcl	2.19%	0.50	0.17	2.95	3.21E-03	2.91E-03
SA	baseline	MD	4344	37	0.009	Pt_0.3	no.cbcl	1.57%	0.42	0.17	2.50	1.24E-02	1.17E-02
SA	baseline	MD	4344	37	0.009	Pt_0.4	no.cbcl	1.86%	0.46	0.17	2.71	6.80E-03	6.17E-03
SA	baseline	MD	4344	37	0.009	Pt_0.5	no.cbcl	1.55%	0.42	0.17	2.48	1.33E-02	1.23E-02
SA	baseline	MD	4344	37	0.009	Pt_1	no.cbcl	1.45%	0.41	0.17	2.39	1.67E-02	1.56E-02
SA	baseline	MD	4344	37	0.009	Pt_5e.08	cbcl_scr_syn_totprob_t	1.21%	0.36	0.18	1.96	4.94E-02	4.34E-02
SA	baseline	MD	4344	37	0.009	Pt_5e.05	cbcl_scr_syn_totprob_t	0.68%	0.26	0.17	1.51	1.31E-01	1.31E-01
SA	baseline	MD	4344	37	0.009	Pt_0.005	cbcl_scr_syn_totprob_t	1.38%	0.38	0.17	2.15	3.14E-02	3.07E-02
SA	baseline	MD	4344	37	0.009	Pt_0.05	cbcl_scr_syn_totprob_t	1.87%	0.44	0.17	2.49	1.27E-02	1.18E-02
SA	baseline	MD	4344	37	0.009	Pt_0.1	cbcl_scr_syn_totprob_t	1.39%	0.38	0.18	2.15	3.12E-02	2.99E-02
SA	baseline	MD	4344	37	0.009	Pt_0.2	cbcl_scr_syn_totprob_t	1.17%	0.35	0.18	1.98	4.73E-02	4.64E-02
SA	baseline	MD	4344	37	0.009	Pt_0.3	cbcl_scr_syn_totprob_t	0.64%	0.26	0.18	1.46	1.43E-01	1.42E-01
SA	baseline	MD	4344	37	0.009	Pt_0.4	cbcl_scr_syn_totprob_t	0.88%	0.31	0.18	1.72	8.59E-02	8.43E-02
SA	baseline	MD	4344	37	0.009	Pt_0.5	cbcl_scr_syn_totprob_t	0.64%	0.26	0.18	1.47	1.43E-01	1.41E-01
SA	baseline	MD	4344	37	0.009	Pt_1	cbcl_scr_syn_totprob_t	0.59%	0.25	0.18	1.40	1.61E-01	1.59E-01
SA	year1	MD	4212	71	0.017	Pt_5e.08	no.cbcl	0.59%	0.25	0.13	1.93	5.39E-02	4.79E-02
SA	year1	MD	4212	71	0.017	Pt_5e.05	no.cbcl	2.01%	0.44	0.12	3.61	3.02E-04	2.74E-04
SA	year1	MD	4212	71	0.017	Pt_0.005	no.cbcl	1.94%	0.43	0.12	3.56	3.71E-04	3.44E-04
SA	year1	MD	4212	71	0.017	Pt_0.05	no.cbcl	2.45%	0.49	0.12	3.98	6.95E-05	5.80E-05
SA	year1	MD	4212	71	0.017	Pt_0.1	no.cbcl	2.26%	0.47	0.12	3.83	1.29E-04	1.12E-04
SA	year1	MD	4212	71	0.017	Pt_0.2	no.cbcl	2.55%	0.50	0.12	4.06	4.90E-05	4.07E-05
SA	year1	MD	4212	71	0.017	Pt_0.3	no.cbcl	2.03%	0.45	0.12	3.63	2.85E-04	2.48E-04
SA	year1	MD	4212	71	0.017	Pt_0.4	no.cbcl	2.17%	0.47	0.12	3.74	1.85E-04	1.54E-04
SA	year1	MD	4212	71	0.017	Pt_0.5	no.cbcl	1.98%	0.44	0.12	3.57	3.60E-04	3.04E-04
SA	year1	MD	4212	71	0.017	Pt_1	no.cbcl	1.83%	0.43	0.12	3.43	5.98E-04	5.16E-04
SA	year1	MD	4212	71	0.017	Pt_5e.08	cbcl_scr_syn_totprob_t	0.46%	0.21	0.13	1.58	1.14E-01	1.07E-01
SA	year1	MD	4212	71	0.017	Pt_5e.05	cbcl_scr_syn_totprob_t	1.10%	0.31	0.13	2.49	1.27E-02	1.23E-02
SA	year1	MD	4212	71	0.017	Pt_0.005	cbcl_scr_syn_totprob_t	0.90%	0.28	0.13	2.26	2.40E-02	2.35E-02
SA	year1	MD	4212	71	0.017	Pt_0.05	cbcl_scr_syn_totprob_t	1.17%	0.32	0.13	2.56	1.05E-02	1.01E-02
SA	year1	MD	4212	71	0.017	Pt_0.1	cbcl_scr_syn_totprob_t	1.12%	0.32	0.13	2.52	1.19E-02	1.15E-02
SA	year1	MD	4212	71	0.017	Pt_0.2	cbcl_scr_syn_totprob_t	1.42%	0.36	0.13	2.83	4.69E-03	4.49E-03
SA	year1	MD	4212	71	0.017	Pt_0.3	cbcl_scr_syn_totprob_t	0.96%	0.30	0.13	2.32	2.02E-02	1.97E-02
SA	year1	MD	4212	71	0.017	Pt_0.4	cbcl_scr_syn_totprob_t	1.07%	0.32	0.13	2.45	1.42E-02	1.36E-02
SA	year1	MD	4212	71	0.017	Pt_0.5	cbcl_scr_syn_totprob_t	0.93%	0.29	0.13	2.28	2.26E-02	2.18E-02
SA	year1	MD	4212	71	0.017	Pt_1	cbcl_scr_syn_totprob_t	0.83%	0.28	0.13	2.16	3.08E-02	2.99E-02

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PHENO	Event	PRS	Subject No	Case No	Case Ratio	PRS Threshold	CBCL_TSCORE	R2_DIFF	Estimate	Std_Error	statistics	Pvalue	LRtest.p
SI	baseline	ADHD	4344	367	0.084	Pt_5e.08	no.cbcl	0.00%	0.00	0.05	0.01	9.93E-01	9.93E-01
SI	baseline	ADHD	4344	367	0.084	Pt_5e.05	no.cbcl	0.24%	0.12	0.06	2.12	3.42E-02	3.41E-02
SI	baseline	ADHD	4344	367	0.084	Pt_0.005	no.cbcl	0.19%	0.10	0.05	1.90	5.78E-02	5.77E-02
SI	baseline	ADHD	4344	367	0.084	Pt_0.05	no.cbcl	0.42%	0.16	0.06	2.82	4.75E-03	4.65E-03
SI	baseline	ADHD	4344	367	0.084	Pt_0.1	no.cbcl	0.46%	0.16	0.05	2.96	3.05E-03	3.01E-03
SI	baseline	ADHD	4344	367	0.084	Pt_0.2	no.cbcl	0.33%	0.14	0.05	2.50	1.24E-02	1.23E-02
SI	baseline	ADHD	4344	367	0.084	Pt_0.3	no.cbcl	0.31%	0.13	0.05	2.43	1.51E-02	1.49E-02
SI	baseline	ADHD	4344	367	0.084	Pt_0.4	no.cbcl	0.36%	0.14	0.06	2.62	8.72E-03	8.61E-03
SI	baseline	ADHD	4344	367	0.084	Pt_0.5	no.cbcl	0.37%	0.15	0.06	2.66	7.78E-03	7.67E-03
SI	baseline	ADHD	4344	367	0.084	Pt_1	no.cbcl	0.38%	0.15	0.06	2.67	7.59E-03	7.48E-03
SI	baseline	ADHD	4344	367	0.084	Pt_5e.08	cbcl_scr_syn_totprob_t	0.00%	-0.01	0.06	-0.14	8.90E-01	8.90E-01
SI	baseline	ADHD	4344	367	0.084	Pt_5e.05	cbcl_scr_syn_totprob_t	0.11%	0.08	0.06	1.42	1.55E-01	1.55E-01
SI	baseline	ADHD	4344	367	0.084	Pt_0.005	cbcl_scr_syn_totprob_t	0.04%	0.05	0.06	0.86	3.88E-01	3.88E-01
SI	baseline	ADHD	4344	367	0.084	Pt_0.05	cbcl_scr_syn_totprob_t	0.13%	0.09	0.06	1.51	1.30E-01	1.30E-01
SI	baseline	ADHD	4344	367	0.084	Pt_0.1	cbcl_scr_syn_totprob_t	0.16%	0.10	0.06	1.71	8.73E-02	8.72E-02
SI	baseline	ADHD	4344	367	0.084	Pt_0.2	cbcl_scr_syn_totprob_t	0.09%	0.07	0.06	1.26	2.06E-01	2.06E-01
SI	baseline	ADHD	4344	367	0.084	Pt_0.3	cbcl_scr_syn_totprob_t	0.08%	0.07	0.06	1.20	2.32E-01	2.32E-01
SI	baseline	ADHD	4344	367	0.084	Pt_0.4	cbcl_scr_syn_totprob_t	0.10%	0.08	0.06	1.37	1.70E-01	1.70E-01
SI	baseline	ADHD	4344	367	0.084	Pt_0.5	cbcl_scr_syn_totprob_t	0.10%	0.08	0.06	1.38	1.68E-01	1.67E-01
SI	baseline	ADHD	4344	367	0.084	Pt_1	cbcl_scr_syn_totprob_t	0.11%	0.08	0.06	1.43	1.54E-01	1.53E-01
SI	year1	ADHD	4212	545	0.129	Pt_5e.08	no.cbcl	0.00%	0.01	0.05	0.21	8.36E-01	8.36E-01
SI	year1	ADHD	4212	545	0.129	Pt_5e.05	no.cbcl	0.12%	0.08	0.05	1.67	9.55E-02	9.54E-02
SI	year1	ADHD	4212	545	0.129	Pt_0.005	no.cbcl	0.26%	0.11	0.05	2.41	1.59E-02	1.58E-02
SI	year1	ADHD	4212	545	0.129	Pt_0.05	no.cbcl	0.88%	0.21	0.05	4.45	8.60E-06	7.80E-06
SI	year1	ADHD	4212	545	0.129	Pt_0.1	no.cbcl	1.02%	0.22	0.05	4.80	1.58E-06	1.44E-06
SI	year1	ADHD	4212	545	0.129	Pt_0.2	no.cbcl	0.80%	0.20	0.05	4.24	2.26E-05	2.11E-05
SI	year1	ADHD	4212	545	0.129	Pt_0.3	no.cbcl	0.69%	0.18	0.05	3.94	8.00E-05	7.59E-05
SI	year1	ADHD	4212	545	0.129	Pt_0.4	no.cbcl	0.77%	0.19	0.05	4.16	3.19E-05	2.99E-05
SI	year1	ADHD	4212	545	0.129	Pt_0.5	no.cbcl	0.79%	0.20	0.05	4.20	2.61E-05	2.44E-05
SI	year1	ADHD	4212	545	0.129	Pt_1	no.cbcl	0.73%	0.19	0.05	4.05	5.20E-05	4.90E-05
SI	year1	ADHD	4212	545	0.129	Pt_5e.08	cbcl_scr_syn_totprob_t	0.00%	0.00	0.05	-0.04	9.67E-01	9.67E-01
SI	year1	ADHD	4212	545	0.129	Pt_5e.05	cbcl_scr_syn_totprob_t	0.02%	0.03	0.05	0.72	4.72E-01	4.72E-01
SI	year1	ADHD	4212	545	0.129	Pt_0.005	cbcl_scr_syn_totprob_t	0.05%	0.05	0.05	1.03	3.02E-01	3.02E-01
SI	year1	ADHD	4212	545	0.129	Pt_0.05	cbcl_scr_syn_totprob_t	0.39%	0.14	0.05	2.90	3.71E-03	3.63E-03
SI	year1	ADHD	4212	545	0.129	Pt_0.1	cbcl_scr_syn_totprob_t	0.52%	0.16	0.05	3.37	7.60E-04	7.41E-04
SI	year1	ADHD	4212	545	0.129	Pt_0.2	cbcl_scr_syn_totprob_t	0.37%	0.14	0.05	2.84	4.49E-03	4.42E-03
SI	year1	ADHD	4212	545	0.129	Pt_0.3	cbcl_scr_syn_totprob_t	0.28%	0.12	0.05	2.48	1.30E-02	1.29E-02
SI	year1	ADHD	4212	545	0.129	Pt_0.4	cbcl_scr_syn_totprob_t	0.33%	0.13	0.05	2.67	7.55E-03	7.46E-03
SI	year1	ADHD	4212	545	0.129	Pt_0.5	cbcl_scr_syn_totprob_t	0.33%	0.13	0.05	2.67	7.54E-03	7.44E-03
SI	year1	ADHD	4212	545	0.129	Pt_1	cbcl_scr_syn_totprob_t	0.30%	0.12	0.05	2.58	1.00E-02	9.90E-03

Table S12. Logistic regression analysis results of new onset cases in year 1 using baseline features. fam_scd refers to the family history of suicide.

Depedent Variable	Estimate	Std.	Error	OR	L95	H95	z	Pr(>|z|)	
new onset SA in year 1	age	0.35	0.15	1.42	1.06	1.91	2.35	1.87E-02	*
	sex	0.12	0.30	1.13	0.63	2.04	0.41	6.79E-01	
	marital.status	-0.62	0.35	0.54	0.27	1.07	-1.77	7.76E-02	
	parental.education	-0.11	0.16	0.89	0.66	1.22	-0.70	4.83E-01	
	household.income	-0.06	0.17	0.94	0.68	1.32	-0.34	7.34E-01	
	poverty	-0.14	0.57	0.87	0.28	2.66	-0.25	8.03E-01	
	cbcl_total	0.99	0.15	2.70	2.00	3.64	6.53	6.72E-11	***
	fam_scd	0.21	0.11	1.24	0.99	1.55	1.90	5.76E-02	.
	MD_PRS	0.34	0.15	1.40	1.04	1.89	2.25	2.47E-02	*
	ADHD_PRS	0.25	0.15	1.28	0.95	1.72	1.63	1.04E-01	
new onset SI in year 1	age	0.06	0.06	1.07	0.95	1.20	1.07	2.84E-01	
	sex	0.01	0.12	1.01	0.80	1.28	0.11	9.13E-01	
	marital.status	-0.18	0.16	0.83	0.61	1.14	-1.15	2.48E-01	
	parental.education	-0.02	0.07	0.98	0.86	1.12	-0.26	7.98E-01	
	household.income	-0.12	0.07	0.89	0.77	1.02	-1.68	9.34E-02	.
	poverty	-0.16	0.30	0.85	0.48	1.53	-0.53	5.97E-01	
	cbcl_total	0.53	0.06	1.70	1.52	1.92	8.86	< 2.00E-16	***
	fam_scd	-0.01	0.06	0.99	0.89	1.11	-0.13	8.97E-01	
	MD_PRS	0.04	0.06	1.04	0.92	1.17	0.61	5.43E-01	
	ADHD_PRS	0.19	0.06	1.21	1.07	1.36	3.10	1.97E-03	**

Table S13.Two PRS prediction model with suicide PRS and other clinical risk factors, including age, sex, child psychopathology, family history of suicide, socioeconomic status. Due to space limitation, the wide table is displayed continuously in two sections. SA: suicide attempts, SI: suicidal ideation. ADHD: attention-deficits hyperactivity disorder, MD: major depression, SA1: suicide attempt GWAS based on *Mullins et al*. 2019. Beta1, Std_Err1, and Pvalue1 are the effect estimate, standard error, and p-value for the first PRS, while Beta2, Std_Err2, and Pvalue2 are the effect estimate, standard error, and p-value for the second PRS. R2_DIFF_m1vsm0 refers to the difference of the Nagelkerke's R^2 for the model with and without the first PRS. R2_DIFF_m2vsm0 refers to the difference of the Nagelkerke's R^2 for the model with and without the second PRS. R2_DIFF_m3vsm0 refers to the difference of the Nagelkerke's R^2 for the model with and without two PRSs. LRtest.p refers to the p-value of the likelihood ratio test between the model including both PRSs and the model including only the first PRS.

baseline	PHENO	PRS1	PRS2	Subject_No	Case_No	Case_Ratio	CBCL_TSCORE	R2_DIFF_m1vsm0
baseline	SA	MD	SA1	4344	37	0.009	cbcl_scr_syn_totprob_t	0.019
year1	SA	MD	SA1	4212	71	0.017	cbcl_scr_syn_totprob_t	-0.017
year1	SI	ADHD	SA1	4212	545	0.129	cbcl_scr_syn_totprob_t	-0.002

R2_DIFF_m2vsm0	R2_DIFF_m3vsm0	Beta1	Std_Error1	Pvalue1	Beta2	Std_Error2	Pvalue2	LRtest.p
0.014	0.031	4.08E-01	1.76E-01	2.04E-02	3.44E-01	1.72E-01	4.58E-02	4.52E-02
0.007	0.249	1.23E-01	1.23E-04	3.96E-02	1.21E-01	3.97E-02	4.73E-01	9.70E-04
0.002	0.104	4.80E-02	4.41E-03	2.87E-02	4.75E-02	2.89E-02	1.37E-01	8.44E-03

SUPPLEMENTARY FIGURES

Figure S1. Genetic diversity of ABCD participants. The first and the second principal components of ABCD genetic samples after quality control are displayed in the X and the Y-axis respectively. Each dot on the plot represents individuals. ABCD participants who clustered with HapMap III European references are highlighted in blue among other participants in black.

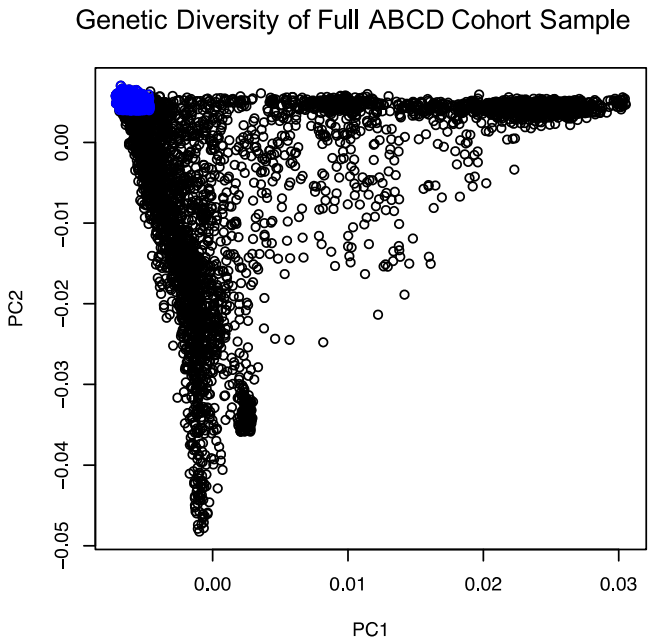

Figure S2. Distinct socioeconomic background of suicidal participants. Plots display socioeconomic background of the genetic cohort compared to the full cohort. The genetics sample consists of European descents and the displayed socioeconomic factors show statistically different proportions of distributions from the full cohort when tested using proportions test (p<1e-05). The first clustered bars in red represent highest parental education, and the second clustered bars in blue represent household income. Poverty status is designated if household income is less than $20,000. All socioeconomic data were obtained from the Parent Demographic Survey.