

Supplementary Online Content

Dalsgaard S, Thorsteinsson E, Trabjerg BB, et al. Incidence rates and cumulative incidences of the full spectrum of diagnosed mental disorders in childhood and adolescence. *JAMA Psychiatry*. Published online November 20, 2019. doi:10.1001/jamapsychiatry.2019.3523

eTable 1. No. of New Cases With Mental Disorders in the Total Cohort and Their Contributing Time of Observation During Follow-up, Stratified by Sex

eTable 2. Cumulative Incidences of Mental Disorders by 13 Years of Age, in a Nationwide Cohort

eTable 3. Cumulative Incidences of Selected Mental Disorders by 6 Years of Age, in a Nationwide Cohort

eTable 4. Sensitivity Analyses of Cumulative Incidences of Mental Disorders by 13 Years of Age, in a Subset of Cohorts Including Only Individuals Born 1995-2003

eFigure 1. Sex- and Age-Specific Incidence Rates and Cumulative Incidences for Organic Mental Disorders, Substance Use Disorders, Alcohol Abuse, and Cannabis Use

eFigure 2. Sex- and Age-Specific Incidence Rates and Cumulative Incidences for Schizophrenia, Acute Psychoses, Bipolar Disorder, and Depressive Episode

eFigure 3. Sex- and Age-Specific Incidence Rates and Cumulative Incidences for Anorexia Nervosa, Bulimia, Personality Disorders, and Other Developmental Disorders

eFigure 4. Sex- and Age-Specific Incidence Rates and Cumulative Incidences for Childhood Autism, Asperger Syndrome, ADHD-Combined Type, and Attachment Disorders

This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. No. of New Cases With Mental Disorders in the Total Cohort^a and Their Contributing Time of Observation During Follow-up, Stratified by Sex

Diagnostic group	No. of incident cases ^b		Time of observation, person-years	
	Females	Males	Females	Males
Any mental disorder	41 350	58 576	7 070 071	7 321 732
Organic mental disorders	179	234	7 285 525	7 683 161
Substance use disorders	2 897	3 225	7 273 401	7 670 391
Alcohol abuse	1 874	2 077	7 278 523	7 676 009
Cannabis use	558	765	7 284 321	7 681 795
Schizophrenia spectrum disorder	1 569	1 109	7 280 736	7 679 897
Schizophrenia	360	250	7 284 899	7 683 468
Acute psychoses	346	274	7 285 086	7 683 367
Mood disorders	5 047	2 349	7 268 231	7 675 281
Bipolar disorder	185	129	7 285 748	7 684 213
Depressive episode	4 793	2 147	7 269 334	7 676 304
Anxiety disorders	19 259	14 282	7 204 623	7 613 514
OCD	2 432	1 927	7 276 498	7 675 642
Eating disorders	4 297	1 132	7 266 196	7 676 563
Anorexia nervosa	1 506	143	7 280 491	7 684 103
Bulimia	282	9	7 285 385	7 684 676
Personality disorders	1 982	649	7 278 197	7 681 658
Intellectual disability	3 091	6 145	7 264 596	7 640 371
Other developmental disorders	4 545	10 948	7 262 184	7 616 556
Autism spectrum disorders	5 354	16 248	7 261 935	7 593 923
Childhood autism	1 600	6 244	7 277 979	7 648 813
Asperger's syndrome	1 260	3 814	7 281 269	7 662 460
ADHD	8 815	21 961	7 245 974	7 562 103
ADHD-combined type	6 995	19 290	7 253 527	7 576 058
ADHD-inattentive type	2 311	3 662	7 277 006	7 666 200
ODD/CD	1 393	4 701	7 278 471	7 655 160
Attachment disorders	1 705	2 813	7 276 336	7 666 547
Tic disorders	1 486	5 307	7 278 860	7 655 735

Abbreviations: OCD, obsessive-compulsive disorder; ADHD, attention-deficit/hyperactivity disorder; ODD/CD, oppositional defiant disorder/conduct disorder; ICD-10-DCR, International Classification of Mental and Behavioural Disorders, 10th edition: Diagnostic Criteria for Research

^a All individuals born in Denmark 1995-2016, followed until 18 years of age or date of death, emigration or Dec 31, 2016, whichever came first.

^b Individuals with more than one disorder were included in the numerator for each of the separate disorders.

eTable 2. Cumulative Incidences of Mental Disorders by 13 Years of Age, in a Nationwide Cohort^a				
Diagnostic group	No. of incident cases		Cumulative incidence (95% CI), %^b	
	Females	Males	Females	Males
Any mental disorder ^d	22 357	47 203	5.17 (5.10-5.24)	10.23 (9.90-10.57)
Organic mental disorders	81	158	0.02 (0.01-0.02)	0.04 (0.02-0.07)
Substance use disorders	233	298	0.05 (0.04-0.06)	0.06 (0.00-0.64)
Alcohol abuse	64	96	0.02 (0.01-0.03)	0.03 (0.00-1.16)
Cannabis use	18	15	0.00 (0.00-0.01)	0.00 (0.00-20.0)
Schizophrenia spectrum disorder	193	312	0.06 (0.05-0.01)	0.08 (0.02-0.24)
Schizophrenia	15	26	0.01 (0.00-0.01)	0.01 (0.00-3.50)
Acute psychoses	58	86	0.02 (0.01-0.02)	0.02 (0.01-0.09)
Mood disorders	513	716	0.16 (0.14-0.17)	0.20 (0.07-0.47)
Bipolar disorder	8	26	0.00 (0.00-0.01)	0.01(0.00-2.50)
Depressive episode	473	642	0.15 (0.13-0.16)	0.18 (0.06-0.45)
Anxiety disorders ^d	7 327	9 177	1.88 (1.83-1.92)	2.17 (1.93-2.44)
OCD	1 150	1 201	0.32 (0.30-0.34)	0.31 (0.24-0.39)
Eating disorders ^c	1 296	874	0.30 (0.29-0.32)	0.16 (0.08-0.31)
Anorexia nervosa	300	67	0.09 (0.08-0.10)	0.02 (0.00-0.20)
Bulimia	<5	<5	-	-
Personality disorders	184	152	0.05 (0.04-0.06)	0.04 (0.00-0.96)
Intellectual disability ^d	2 316	5 129	0.51 (0.49-0.53)	1.07 (1.01-1.13)
Other developmental disorders ^d	3 190	9 368	0.72 (0.70-0.75)	2.04 (1.97-2.10)
Autism spectrum disorders ^d	3 334	13 194	0.80 (0.77-0.83)	2.90 (2.81-2.99)
Childhood autism ^d	1 254	5 431	0.27 (0.26-0.29)	1.12 (1.08-1.16)
Asperger's syndrome ^d	557	2 777	0.15 (0.14-0.17)	0.67 (0.61-0.74)
ADHD ^d	5 440	18 216	1.34 (1.30-1.38)	4.20 (4.08-4.33)
ADHD-combined type ^d	4 570	16 223	1.12 (1.09-1.15)	3.74 (3.63-3.85)
ADHD-inattentive type ^d	1 095	2 669	0.28 (0.26-0.29)	0.64 (0.58-0.70)
ODD/CD ^d	861	3 780	0.21 (0.19-0.22)	0.87 (0.83-0.92)
Attachment disorders ^d	1 229	2 421	0.28 (0.26-0.30)	0.53 (0.49-0.57)
Tic disorders ^d	1 225	4 718	0.30 (0.29-0.32)	1.12 (1.07-1.16)

Abbreviations: OCD, obsessive-compulsive disorder; ADHD, attention-deficit/hyperactivity disorder; ODD/CD, oppositional defiant disorder/conduct disorder.

^a All individuals born in Denmark 1995-2016, followed until 13 years of age or date of death, emigration or Dec 31, 2016, whichever came first.

^b Measures the probability of being treated for the disorder before 13 years of age. Individuals with more than one disorder were included in the numerator for each of the separate disorders.

^c Males had higher probability of being diagnosed with the disorder by 13 years of age, than females

^d Females had higher probability of being diagnosed with the disorder by 13 years of age, than males

eTable 3. Cumulative Incidences of Selected Mental Disorders by 6 Years of Age, in a Nationwide Cohort^a				
Diagnostic group	No. of incident cases		Cumulative incidence (95% CI), %^b	
	Females	Males	Females	Males
Any mental disorder ^{c,d}	7 142	14 397	1.45 (1.42-1.49)	2.78 (2.44-3.15)
Anxiety disorders	1 327	1 620	0.27 (0.26-0.29)	0.31 (0.13-0.67)
Neurodevelopmental disorders				
Intellectual disability ^d	1 097	2 289	0.22 (0.21-0.24)	0.44 (0.39-0.50)
Other developmental disorders ^d	1 102	3 062	0.22 (0.21-0.24)	0.59 (0.54-0.65)
Autism spectrum disorders ^d	1 056	4 181	0.22 (0.20-0.23)	0.81 (0.73-0.89)
Childhood autism ^d	564	2 450	0.12 (0.11-0.13)	0.47 (0.44-0.51)
ADHD ^d	943	3 134	0.19 (0.18-0.21)	0.61 (0.50-0.73)
ADHD-combined type ^d	753	2 704	0.15 (0.14-0.17)	0.52 (0.43-0.63)
ADHD-inattentive type ^d	207	496	0.04 (0.04-0.05)	0.10 (0.05-0.17)
ODD/CD ^d	201	702	0.04 (0.04-0.05)	0.14 (0.11-0.18)
Attachment disorders ^d	398	707	0.08 (0.07-0.09)	0.14 (0.11-0.18)
Tic disorders ^d	177	584	0.04 (0.03-0.04)	0.11 (0.09-0.14)

Abbreviations: ADHD, attention-deficit/hyperactivity disorder; ODD/CD, oppositional defiant disorder/conduct disorder.

^a All individuals born in Denmark 1995-2010, followed until six years of age or Dec 31, 2016, whichever came first.

^b Measures the probability of being treated for the disorder before six years of age. Individuals with more than one disorder were included in the numerator for each of the separate disorders.

^c In this sample, 2.13% (2.11-2.16%) were diagnosed with a mental disorder before six years of age (n= 21 539).

^d Males had higher probability of being diagnosed with the disorder by six years of age, than females

eTable 4. Sensitivity Analyses of Cumulative Incidences of Mental Disorders by 13 Years of Age, in a Subset of Cohorts Including Only Individuals Born 1995-2003^a

Diagnostic group	No. of incident cases		Cumulative incidence (95% CI), % ^b	
	Females	Males	Females	Males
Any mental disorder	13 028	27 738	4.64 (4.56-4.72)*	9.36 (9.01-9.70)*
Organic mental disorders	46	114	0.02 (0.01-0.02)	0.04 (0.02-0.08)
Substance use disorders	140	178	0.05 (0.04-0.06)	0.06 (0.002-0.65)
Alcohol abuse	56	86	0.02 (0.02-0.03)	0.03 (0.00-0.99)
Cannabis use	8	9	0.00 (0.00-0.01)	0.00 (0.00-27.02)
Schizophrenia spectrum disorder	142	234	0.05 (0.04-0.06)	0.08 (0.02-0.24)
Schizophrenia	14	20	0.01 (0.00-0.01)	0.01 (0.00-3.52)
Acute psychoses	46	71	0.02 (0.01-0.02)	0.02 (0.01-0.09)
Mood disorders	450	577	0.16 (0.15-0.18)	0.19 (0.06-0.47)
Bipolar disorder	6	16	0.00 (0.00-0.01)	0.01 (0.00-4.08)
Depressive episode	416	518	0.15 (0.14-0.16)	0.18 (0.06-0.45)
Anxiety disorders	4 635	5 555	1.65 (1.60-1.70)*	1.87 (1.63-2.14)
OCD	821	866	0.29 (0.27-0.31)	0.29 (0.22-0.38)
Eating disorders	843	424	0.30 (0.28-0.32)	0.14 (0.06-0.30)
Anorexia nervosa	274	52	0.10 (0.09-0.11)	0.02 (0.00-0.22)
Bulimia	<5	0	-	-
Personality disorders	134	104	0.05 (0.04-0.06)	0.04 (0.00-0.96)
Intellectual disability	1 517	3 316	0.54 (0.51-0.57)	1.12 (1.05-1.19)
Other developmental disorders	1 714	5 520	0.61 (0.58-0.64)*	1.86 (1.79-1.93)
Autism spectrum disorders	1 806	7 297	0.64 (0.61-0.67)*	2.46 (2.37-2.56)*
Childhood autism	570	2 506	0.20 (0.19-0.22)*	0.85 (0.80-0.89)*
Asperger's syndrome	417	2 088	0.15 (0.13-0.16)	0.70 (0.64-0.77)
ADHD	3 105	11 101	1.11 (1.07-1.15)*	3.75 (3.62-3.87)*
ADHD-combined type	2 607	9 902	0.93 (0.89-0.96)*	3.34 (3.22-3.46)*
ADHD-inattentive type	625	1 636	0.22 (0.21-0.24)*	0.55 (0.49-0.61)
ODD/CD	561	2 562	0.20 (0.18-0.22)	0.86 (0.82-0.91)
Attachment disorders	729	1 479	0.26 (0.24-0.28)	0.50 (0.46-0.54)
Tic disorders	701	2 895	0.25 (0.23-0.27)*	0.98 (0.93-1.02)*

Abbreviations: OCD, obsessive-compulsive disorder; ADHD, attention-deficit/hyperactivity disorder; ODD/CD, oppositional defiant disorder/conduct disorder.

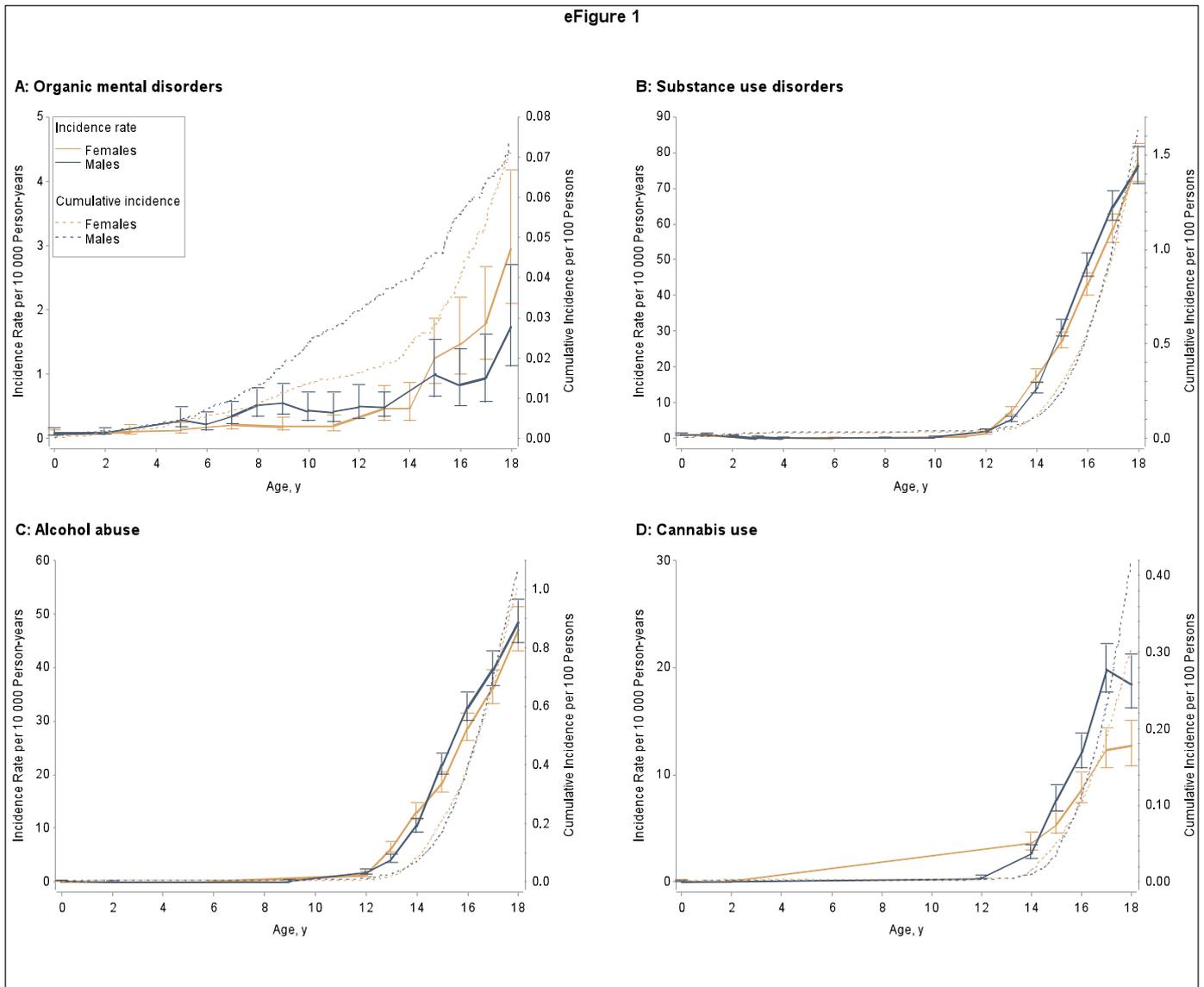
^a All individuals born in Denmark 1995-2003, followed until 13 years of age or date of death, emigration or Dec 31, 2016, whichever came first.

^b Measures the probability of being treated for the disorder before 13 years of age. Individuals with more than one disorder were included in the numerator for each of the separate disorders.

^c In this sample, 7.06% (7.00 - 7.13%) were diagnosed with a mental disorder before 13 years of age (n=40 766).

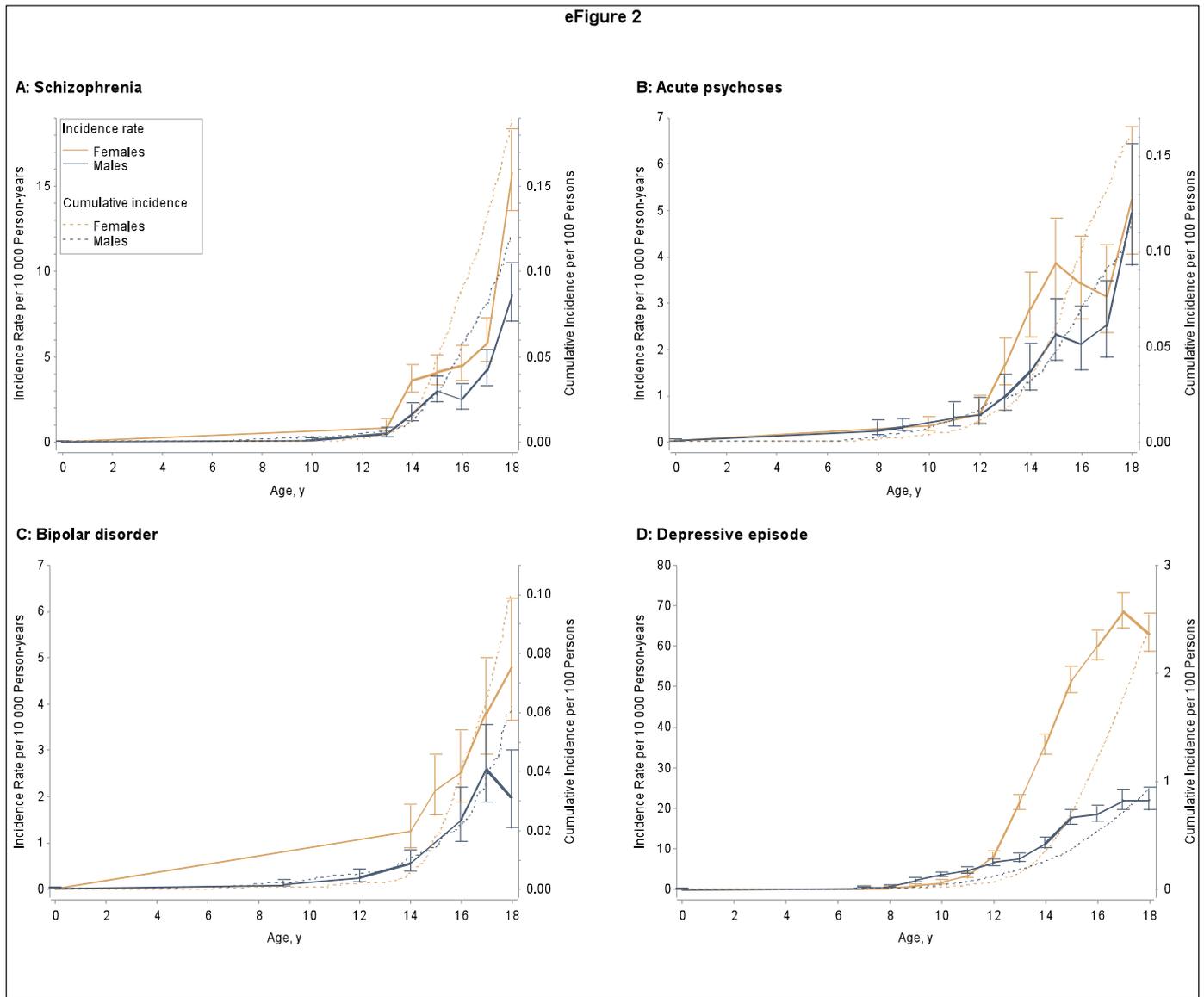
* The cumulative incidence estimated in this restricted cohort with complete follow-up of all individuals until age 13 years, was significantly different from the estimated cumulative incidence in the total sample.

eFigure 1. Sex- and Age-Specific Incidence Rates and Cumulative Incidences for Organic Mental Disorders, Substance Use Disorders, Alcohol Abuse, and Cannabis Use



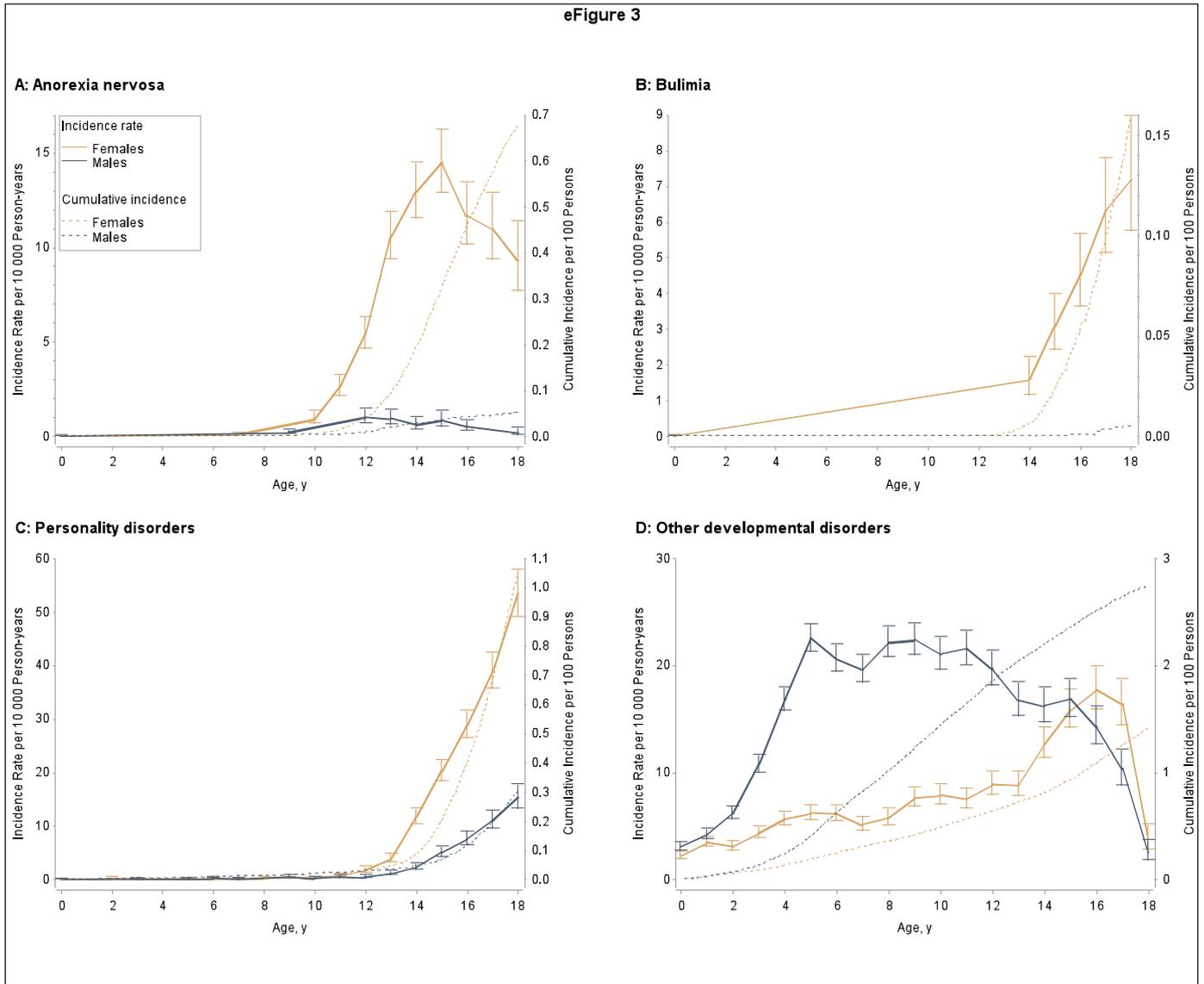
Organic mental disorders were defined as *ICD-10 Classification of Mental and Behavioral Disorders: Diagnostic Criteria for Research [ICD-10-DCR]*, codes F00-F09; any substance use disorders as *ICD-10-DCR* codes F10-F19; alcohol abuse as *ICD-10-DCR* codes F10; cannabis use as *ICD-10-DCR* codes F12. Error bars show the 95% CIs in designated age ranges. Owing to the large sample size, the 95% CIs for the cumulative incidences are very close to the estimates and are therefore not shown. The incidence rates measure the number of incident cases being diagnosed for the first time (with a mental disorder of interest) at different ages, per 10 000 person-years. The cumulative incidence measures the probability of being diagnosed with the disorder before a given age, per 100 persons. Because the cumulative incidences are estimated continuously with respect to age and the incidence rates are estimated in one-year age intervals, the abscissa for the cumulative incidence measures the exact age, whereas the abscissa for the incidence rates measures the lowest cutoff point for the age interval. Note that the y-axis scales differ by disorder to correspond to the range of observed outcomes.

eFigure 2. Sex- and Age-Specific Incidence Rates and Cumulative Incidences for Schizophrenia, Acute Psychoses, Bipolar Disorder, and Depressive Episode



Schizophrenia was identified as *ICD-10-DCR codes F20*; acute psychoses as *ICD-10-DCR codes F23*); bipolar disorder as *ICD-10-DCR codes F30-F31*; depressive episode as *ICD-10-DCR codes F32-F33*. Error bars show the 95% CIs in designated age ranges. Owing to the large sample size, the 95% CIs for the cumulative incidences are very close to the estimates and are therefore not shown. The incidence rates measure the number of incident cases being diagnosed for the first time (with a mental disorder of interest) at different ages, per 10 000 person-years. The cumulative incidence measures the probability of being diagnosed with the disorder before a given age, per 100 persons. Because the cumulative incidences are estimated continuously with respect to age and the incidence rates are estimated in one-year age intervals, the abscissa for the cumulative incidence measures the exact age, whereas the abscissa for the incidence rates measures the lowest cutoff point for the age interval. Note that the y-axis scales differ by disorder to correspond to the range of observed outcomes.

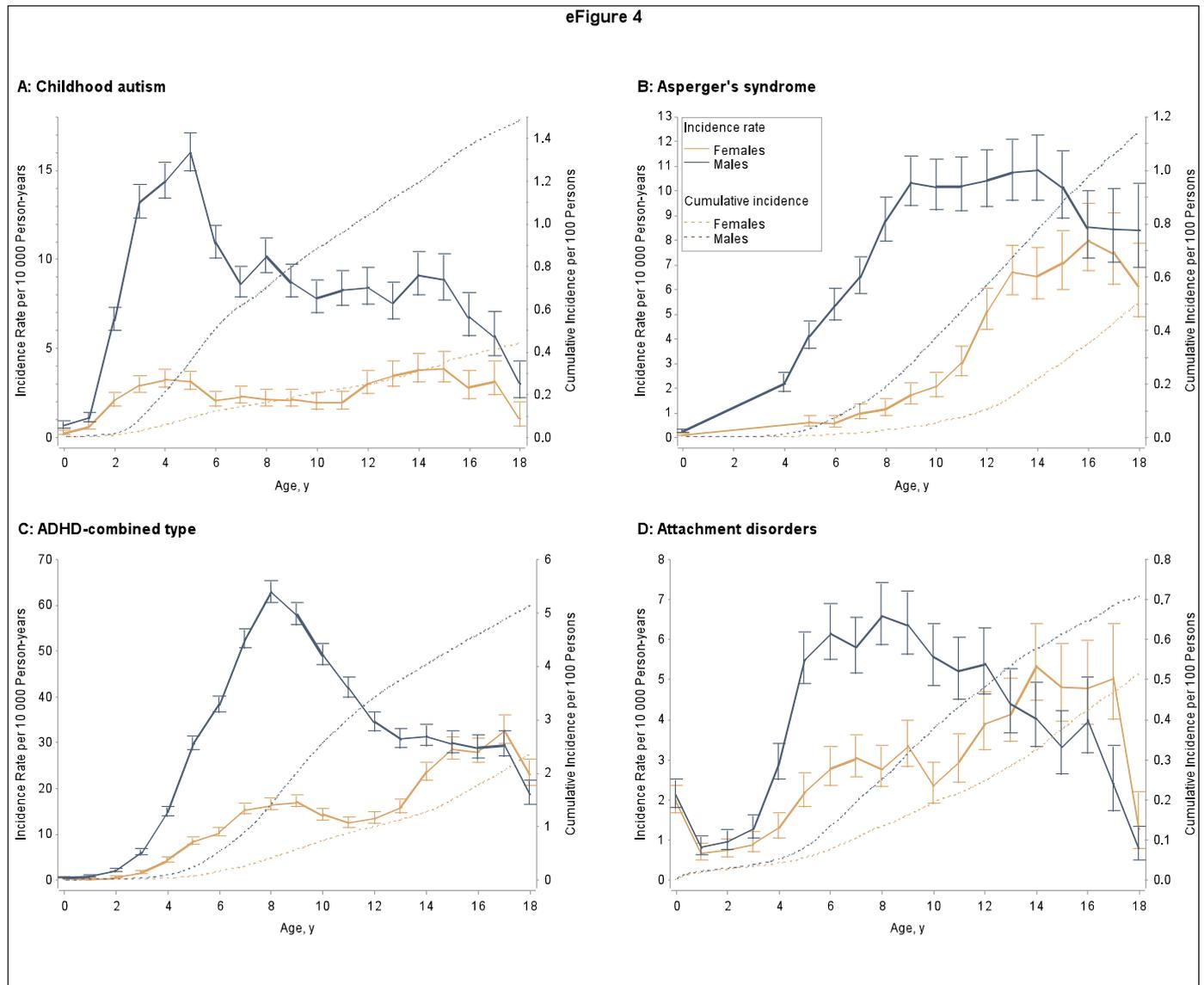
eFigure 3. Sex- and Age-Specific Incidence Rates and Cumulative Incidences for Anorexia Nervosa, Bulimia, Personality Disorders and Other Developmental Disorders



Anorexia nervosa was identified as *ICD-10-DCR codes F50.0*; bulimia as *ICD-10-DCR codes F50.2*; personality disorders as *ICD-10-DCR codes F60-F69*; other developmental disorders as *ICD-10-DCR codes F80-F83*.

Error bars show the 95% CIs in designated age ranges. Owing to the large sample size, the 95% CIs for the cumulative incidences are very close to the estimates and are therefore not shown. The incidence rates measure the number of incident cases being diagnosed for the first time (with a mental disorder of interest) at different ages, per 10 000 person-years. The cumulative incidence measures the probability of being diagnosed with the disorder before a given age, per 100 persons. Because the cumulative incidences are estimated continuously with respect to age and the incidence rates are estimated in one-year age intervals, the abscissa for the cumulative incidence measures the exact age, whereas the abscissa for the incidence rates measures the lowest cutoff point for the age interval. Note that the y-axis scales differ by disorder to correspond to the range of observed outcomes.

eFigure 4. Sex- and Age-Specific Incidence Rates and Cumulative Incidences for Childhood Autism, Asperger Syndrome, ADHD-Combined Type, and Attachment Disorders



Childhood autism was identified as *ICD-10-DCR codes F84.0*; Asperger syndrome as *ICD-10-DCR codes F84.5*; ADHD-combined type as *ICD-10-DCR codes F90*; attachment disorders as *ICD-10-DCR codes F94.x excl. F94.0*.

Error bars show the 95% CIs in designated age ranges. Owing to the large sample size, the 95% CIs for the cumulative incidences are very close to the estimates and are therefore not shown. The incidence rates measure the number of incident cases being diagnosed for the first time (with a mental disorder of interest) at different ages, per 10 000 person-years. The cumulative incidence measures the probability of being diagnosed with the disorder before a given age, per 100 persons. Because the cumulative incidences are estimated continuously with respect to age and the incidence rates are estimated in one-year age intervals, the abscissa for the cumulative incidence measures the exact age, whereas the abscissa for the incidence rates measures the lowest cutoff point for the age interval. Note that the y-axis scales differ by disorder to correspond to the range of observed outcomes