

Supplementary Appendices

Appendix 1: The 13 cohorts and the data available for each cohort

WOB		Birthday during academic year																							
		2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
01/09/2002	31/08/2003			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
01/09/2003	30/08/2004				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
01/09/2004	31/08/2005					0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
01/09/2005	31/08/2006						0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
01/09/2006	31/08/2007							0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
01/09/2007	30/08/2008								0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
01/09/2008	31/08/2009									0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
01/09/2009	31/08/2010										0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
01/09/2010	31/08/2011											0	1	2	3	4	5	6	7	8	9	10	11	12	13
01/09/2011	30/08/2012												0	1	2	3	4	5	6	7	8	9	10	11	12
01/09/2012	31/08/2013													0	1	2	3	4	5	6	7	8	9	10	11
01/09/2013	31/08/2014														0	1	2	3	4	5	6	7	8	9	10
01/09/2014	31/08/2015															0	1	2	3	4	5	6	7	8	9

Key: Green = pre-school, Yellow = statutory school age, Orange = optional education to age 18. We’ve only included the first four cohorts because they have complete data from KS1–KS4.



Appendix 2: Clinical codes used to identify neurodevelopmental conditions in health records

Attention Deficit Hyperactive Disorder	
Read Code v2	Description
6A61.	adhd annual review attention deficit hyperactivity disorder annual review
8BPT.	drug therapy for adhd drug therapy adhd (attention deficit hyperactivity disorder) drug therapy for adhd (attention deficit hyperactivity disorder)
8BPT0	stimulant drug therapy adhd stimulant drug therapy for adhd stimulant drug therapy for adhd (attention deficit hyperactivity disorder)
8BPT1	non-stimulant drug therapy adhd non-stimulant drug therapy for adhd non-stimulant drug therapy for adhd (attention deficit hyperactivity disorder)
9Ngp.	on drug therapy adhd on drug ther adhd (attention deficit hyperactivity disorder) on drug therapy for adhd (attention deficit hyperactivity disorder)
9Ngp0	on stimulant drug therapy adhd on stim drug ther adhd (attention def hyperactivity disorder) on stimulant drug therapy for adhd (attention deficit hyperactivity disorder)
9Ngp1	on non-stimulant drug ther adhd on non-stimulant drug therapy for adhd on non-stimulant drug therapy for adhd (attention deficit hyperactivity disorder)
9OI8.	adhd monitr invitatn 1st lettr adhd monitoring invitation first letter attention deficit hyperactivity disorder monitoring invitation first letter
9OI9.	adhd monitr invitatn 2nd lettr adhd monitoring invitation second letter attention deficit hyperactivity disorder monitoring invitation second letter
9OIA.	adhd monitr invitatn 3rd lettr adhd monitoring invitation third letter attention deficit hyperactivity disorder monitoring invitation third letter
dw4..	Guanfacine
dw41.	INTUNIV 1mg m/r tablets
dw42.	GUANFACINE 1mg m/r tablets
dw43.	INTUNIV 2mg m/r tablets
dw44.	GUANFACINE 2mg m/r tablets
dw45.	INTUNIV 3mg m/r tablets
dw46.	GUANFACINE 3mg m/r tablets
dw47.	INTUNIV 4mg m/r tablets
dw48.	GUANFACINE 4mg m/r tablets
E2E..	childhood hyperkinetic syndr. childhood hyperkinetic syndrome
E2E0.	child attention deficit disord child attention deficit disorder
E2E00	attention deficit-not hyperact attention deficit without hyperactivity
E2E01	attention deficit +hyperactive attention deficit with hyperactivity
E2E0z	child attent.deficit dis.nos child attention deficit disorder nos
E2E1.	hyperkinesis+development delay hyperkinesis with developmental delay
E2E2.	hyperkinetic conduct disorder
E2Ey.	other hyperkinetic manifestat. other hyperkinetic manifestation
E2Ez.	hyperkinetic syndrome nos
Eu90.	[x]hyperkinetic disorders
Eu900	[x]disturbance activity/attntn [x]disturbance of activity and attention
Eu901	[x]hyperkinetic conduct disord [x]hyperkinetic conduct disorder
Eu902	[x]def atten motor cont percep [x]deficits in attention, motor control and perception
Eu90y	[x]oth hyperkinetic disorders [x]other hyperkinetic disorders
Eu90z	[x]hyperkinetic disorder, unsp [x]hyperkinetic disorder, unspecified
Eu9y7	[x]attention deficit disorder
ZS91.	attention defici disorder
dc1..	dexamfetamine sulphate
dc11.	*dexedrine 5mg tablets
dc12.	*durophet 7.5mg m/r capsules
dc13.	*durophet 12.5mg m/r capsules
dc14.	*durophet 20mg m/r capsules
dc1w.	dexamfetamine sulph 5mg tabs dexamfetamine sulphate 5mg tablets
dc1x.	*dexamphetamine 7.5mg m/r caps dexamphetamine sulphate 7.5mg m/r capsules
dc1y.	*dexamphetamine 12.5mg caps dexamphetamine sulphate 12.5mg m/r capsules
dc1z.	*dexamphetamine 20mg m/r caps dexamphetamine sulphate 20mg m/r capsules
dw1..	methylphenidate
dw11.	methylphenidate hcl 10mg tabs methylphenidate hydrochloride 10mg tablets

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Appendix 2: Continued

Attention Deficit Hyperactive Disorder	
Read Code v2	Description
dw12.	ritalin 10mg tablets
dw13.	*equasym 5mg tablets
dw14.	*equasym 20mg tablets
dw15.	*equasym 10mg tablets
dw16.	equasym xl 20mg m/r capsules
dw17.	concerta xl 18mg m/r tablets
dw18.	concerta xl 36mg m/r tablets
dw19.	*tranquilyn 5mg tablets
dw1A.	*tranquilyn 10mg tablets
dw1B.	*tranquilyn 20mg tablets
dw1C.	equasym xl 10mg m/r capsules
dw1D.	equasym xl 30mg m/r capsules
dw1E.	medikinet xl 10mg m/r capsules
dw1F.	medikinet xl 20mg m/r capsules
dw1G.	medikinet xl 30mg m/r capsules
dw1H.	medikinet xl 40mg m/r capsules
dw1I.	concerta xl 27mg m/r tablets
dw1J.	medikinet 5mg tablets
dw1K.	medikinet 10mg tablets
dw1L.	medikinet 20mg tablets
dw1M.	medikinet xl 5mg m/r capsules
dw1q.	methylphenidate 5mg m/r caps methylphenidate hydrochloride 5mg m/r capsules
dw1r.	methylphenidate 27mg m/r tabs methylphenidate hydrochloride 27mg m/r tablets
dw1s.	methylphenidate 40mg m/r caps methylphenidate hydrochloride 40mg m/r capsules
dw1t.	methylphenidate 10mg m/r caps methylphenidate hydrochloride 10mg m/r capsules
dw1u.	methylphenidate 30mg m/r caps methylphenidate hydrochloride 30mg m/r capsules
dw1v.	methylphenidate 36mg m/r tabs methylphenidate hydrochloride 36mg m/r tablets
dw1w.	methylphenidate 18mg m/r tabs methylphenidate hydrochloride 18mg m/r tablets
dw1x.	methylphenidate 20mg m/r caps methylphenidate hydrochloride 20mg m/r capsules
dw1y.	methylphenidate hcl 5mg tabs methylphenidate hydrochloride 5mg tablets
dw1z.	methylphenidate hcl 20mg tabs methylphenidate hydrochloride 20mg tablets
dw2..	atomoxetine
dw21.	strattera 10mg capsules
dw22.	strattera 18mg capsules
dw23.	strattera 25mg capsules
dw24.	strattera 40mg capsules
dw25.	strattera 60mg capsules
dw26.	strattera 80mg capsules
dw2u.	atomoxetine 80mg capsules
dw2v.	atomoxetine 60mg capsules
dw2w.	atomoxetine 40mg capsules
dw2x.	atomoxetine 25mg capsules
dw2y.	atomoxetine 18mg capsules
dw2z.	atomoxetine 10mg capsules
dw3..	lisdexamfetamine
dw31.	elvanse 30mg capsules
dw32.	elvanse 50mg capsules
dw33.	elvanse 70mg capsules
dw3x.	lisdexamfetamine dim 70mg caps lisdexamfetamine dimesylate 70mg capsules
dw3y.	lisdexamfetamine dim 50mg caps lisdexamfetamine dimesylate 50mg capsules
dw3z.	lisdexamfetamine dim 30mg caps lisdexamfetamine dimesylate 30mg capsules

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Appendix 2: Continued

ICD code	Description
F90	hyperkinetic disorders
F90.0	disturbance of activity and attention
F90.1	hyperkinetic conduct disorder
F90.2	attention deficit hyperactivity disorder, combined type
F90.8	other hyperkinetic disorders
F90.9	hyperkinetic disorder, unspecified
Autism Spectrum Disorder	
Read Code v2	Description
E140.	infantile autism
E1400	infantile autism – active active infantile autism
E1401	infantile autism – residual residual infantile autism
E140z	infantile autism nos
Eu840	[x]childhood autism
Eu841	[x]atypical autism
Eu845	[x]asperger's syndrome
1J9..	suspected autism
ICD code	Description
F84.0	Childhood autism
F84.1	Atypical autism
F84.2	Rett's syndrome
F84.3	Other childhood disintegrative disorder
F84.4	Overactive disorder associated with mental retardation and stereotyped movements
F84.5	Asperger's syndrome
F84.9	Pervasive developmental disorders, unspecified
Learning Difficulties	
Read Code v2	Description
R0463	[d]dyslexia
2B55.	o/e - dyslexia
E2F02	developmental dyslexia
Eu810	[x]specific reading disorder
Eu81.	[x]specif scholastic devel dis [x]specific developmental disorders of scholastic skills
Eu81z	[x]dev dis scholas skills unsp [x]developmental disorder of scholastic skills, unspecified
Eu80z	[x]dev disord speech/lang unsp [x]developmental disorder of speech and language unspecified [x]developmental disorder of speech and language, unspecified
Eu800	[x]specif speech articulat dis [x]specific speech articulation disorder
2B5..	o/e - symbolic dysfunction
R046.	[d]other symbolic dysfunction
Eu83.	[x]mix specific develop disord [x]mixed specific developmental disorders
Eu811	[x]specific spelling disorder
Eu81y	[x]oth dis scholastic skills [x]other developmental disorders of scholastic skills
Eu801	[x]expressive language disordr [x]expressive language disorder
8E23.	dyslexia training
Eu82.	[x]spec devel disor motor func [x]specific developmental disorder of motor function
Eu813	[x]mixed scholastic skill dis [x]mixed disorder of scholastic skills
Eu80.	[x]spec develop dis speech/lan [x]specific developmental disorders of speech and language
Eu812	[x]specific disord arithmetic [x]specific disorder of arithmetical skills
ICD code	Description
F81	specific developmental disorders of scholastic skills
F81.0	specific reading disorder
F81.8	other developmental disorders of scholastic skills
F81.9	developmental disorder of scholastic skills, unspecified
F80.9	developmental disorder of speech and language, unspecified

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Appendix 2: Continued

Learning Difficulties

Read Code v2	Description
F80.0	specific speech articulation disorder
F83	mixed specific developmental disorders
F81.1	specific spelling disorder
F80.1	expressive language disorder
F82	specific developmental disorder of motor function
F81.3	mixed disorder of scholastic skills
F80	specific developmental disorders of speech and language
F81.2	specific disorder of arithmetical skills
R48	dyslexia and other symbolic dysfunctions, not elsewhere specified
R48.0	dyslexia and alexia

Tic Disorder

Read Code v2	Description
2974	o/e - spasm/tic
2974.12	o/e - tic
1B24.00	has a tic
1B24.11	tic - symptom
E272.00	tics
E272000	tic disorder unspecified
E272100	transient childhood tic
E272200	chronic motor tic disorder
E272300	gilles de la tourette's disorder
E272z00	tic nos
Eu95.00	[x]tic disorders
Eu95000	[x]transient tic disorder
Eu95100	[x]chronic motor or vocal tic disorder
Eu95200	[x]comb vocal multiple motor tic disorder - de la tourette
Eu95y00	[x]other tic disorders
Eu95z00	[x]tic disorder, unspecified
F133.00	tics of organic origin

ICD code	Description
F95	Tic Disorder
F95.0	Transient tic disorder
F95.1	Chronic motor or vocal tic disorder
F95.2	De la Tourette
F95.8	Other tic disorders
F95.9	Tic disorder, unspecified



Appendix 3: Sensitivity analysis of recorded NDC proportions after excluding children receiving respite (short breaks) care

	No care experience (N=123,830)		Care experience (N=3,150)		Care experience (excluding respite) (N=2,955)	
	Diagnosed	Proportions/ 10,000	Diagnosed	Proportions/ 10,000	Diagnosed	Proportions/ 10,000
ASD	3,880	313	275	876	175	599
Learning Difficulties	27,075	2,187	1,475	4,686	1,320	4,464
Specific Learning Difficulties	11,950	965	600	1,902	535	1,813
ADHD	3,230	261	365	1,152	310	1,042
Dyslexia	6,285	508	140	444	140	467
Dyspraxia	720	58	15	41	<>	<>
Dyscalculia	720	58	20	63*	20	68*
Tic Disorder	760	61	20	57	<>	<>
NDC overall	35,760	2,888	1,765	5,606	1,585	5,364

Note. Tic Disorder and Dyspraxia were masked (denoted as <>), in line with disclosure control, due to disclosure risk (differences <10); *Proportions are based on rounded counts to prevent back-calculation of underlying counts.

