CLOSER work package 9:

Harmonised childhood environment and adult wellbeing measures user guide

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How to cite the data

Citation guidance is provided with the UK Data Service (UKDS) downloads and are also available on CLOSER's UKDS series page (series ID: 2000111).

How to cite this guide

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Preface

CLOSER (Cohort & Longitudinal Studies Enhancement Resources) aims to maximise the use, value and impact of longitudinal studies, both at home and abroad. Bringing together eight leading studies, the British Library and the UK Data Service, CLOSER works to stimulate interdisciplinary research, develop shared resources, provide training, and share expertise. In this way CLOSER is helping to build the body of knowledge on how life in the UK is changing – both across generations and in comparison to the rest of the world.

CLOSER's research includes a number of work packages focused on retrospective harmonisation, their aim being to make the data from different longitudinal studies more comparable in order to find out how life in the UK is changing from generation to generation. This documentation describes a dataset produced as part of the CLOSER harmonisation work package on childhood environment variables of potential relevance to wellbeing in later life.

Acknowledgements

Introduction

This CLOSER interdisciplinary project used data from the MRC National Survey of Health and Development (NSHD), the 1958 National Child Development Study (NCDS) and the 1970 British Cohort Study (BCS70) to address the following questions:

i)   Is father's social class associated with mental wellbeing in adulthood?
ii)   Is the childhood environment conceived more broadly on multiple domains (family socio-economic disadvantage, impaired child-rearing and parenting, family instability, and poor parental health) associated with adult mental wellbeing, and are associations explained by poor childhood health?
iii)   Are correlations between these material and psychosocial domains consistent in each of the studies?

This project identified measures of the childhood socio-economic and psychosocial environment that may be of relevance to mental wellbeing in adulthood across three national birth cohort studies. The aim was to collate or derive variables from childhood which were comparable across the three studies in order to test their prospective association with later wellbeing.

These datasets formed the basis of an article by Wood et al. (2017), in conjunction with data harmonised as part of CLOSER Work Package 2.

Studies included

- 1946 MRC National Survey of Health and Development (NSHD)
- 1958 National Child Development Study (NCDS)
- 1970 British Cohort Study (BCS70)

Methods

In creating the measures of the childhood environment, the following approach was taken. Firstly, the literature on childhood risk factors for poor mental health and mental wellbeing in adulthood was used to identify relevant domains of the childhood environment. Five domains of the childhood environment were identified: socio-economic, child rearing and parenting, family instability, parental health, and antenatal/perinatal problems. We considered that these captured circumstances that were "external" to the child. Factors such as childhood cognition, illness and mental health may be influenced by earlier childhood circumstances and are arguably on the explanatory pathway linking the childhood environment to later mental wellbeing and they were not the main focus of this study.

Once the childhood environment domains had been identified the most relevant variables were found on each study. We recognised the limits of retrospective harmonisation across all these childhood environment domains. Our aim was to identify variables that capture similar constructs for each of these domains and take a coordinated analytical approach to maximise comparability across the studies.

When assessing comparability of measures across the studies we looked at who answered the question (i.e. a study member, a parent, a teacher or a health visitor), the age of the study member when the measure was collected, as well as the question wording. In most instances we used the original questions, but we also used previously derived variables and did not go back to the original data if the derived measure was suitable. Variables were derived which had the same categories across the studies, where possible. When data were collected on the same measure at multiple sweeps in childhood we derived the mean across the sweeps or counted the number of sweeps in a particular level of exposure.

Sample selection

No exclusions were made.

Data cleaning

Overall there was very little data cleaning which needed to be carried out as we used cleaned variables provided by the studies for the harmonised variable derivations. In some instances, missing data were substituted with observations from earlier or later sweeps. Where this has been done a flag has been created to show that the observation was missing and has been substituted with available data. All missing data were coded up as either missing data due to sweep non-response, or missing data due to item non-response.

Limitations

Differences between the studies included question wording, different ages when the measures were collected and differences in who answered the question. Some childhood measures were based upon parental assessments, while some were teacher or health visitor assessments, or were obtained from school records. For example, absence from school was based upon administrative data from school records plus parental self-reports in NSHD. In NCDS and BCS70, school absence is based upon parental self-reports alone. Whilst short-term as well as longer-term separation from mother was captured in the NSHD and the NCDS, in the BCS70 the question refers only to long-term and more permanent separation.

Given improvements in housing conditions across the 20th century, some measures were not applicable in BCS70. For example, in BCS70 lack of hot water in accommodation was not asked about at ages 10 and over and therefore it was assumed when creating the lack of household amenities derived variable for the

BCS70 that all study members had access to hot water. Additionally, two measures were reported retrospectively in adulthood (both parent-child relationship measures in NSHD), although the majority were prospective.

These differences are noted for the individual measures in the documentation which follows. Where there were differences in the measures which meant that they could not be harmonised standardised measures were also derived using z-score transformation to aide comparison across the three studies. The standardised variables are identified by "z" at the end of the variable name and are described in the documentation.

Quality Assessment

This section presents some of the findings on childhood environment and adult mental wellbeing cross the three studies.

Mental wellbeing in adulthood

Adult mental wellbeing was measured using the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) in all three studies. WEMWBS is a validated instrument which measures both the eudemonic and hedonic aspects of wellbeing (Tennant et al., 2007) and comprises 14 items on a 5-point Likert scale which are totalled to give a score ranging from 14 to 70, with 70 reflecting higher levels of wellbeing. Wellbeing was measured at age 60-64 years in NSHD, age 50 in NCDS and age 42 in BCS70.

Figure 1 shows that mean wellbeing was higher in NSHD (mean=51.6, SD=8.3) than in NCDS (49.2, 8.1) or BCS70 (49.1, 8.3). These differences may be due to age and/or cohort effects.

Figure 1: Wellbeing across the studies
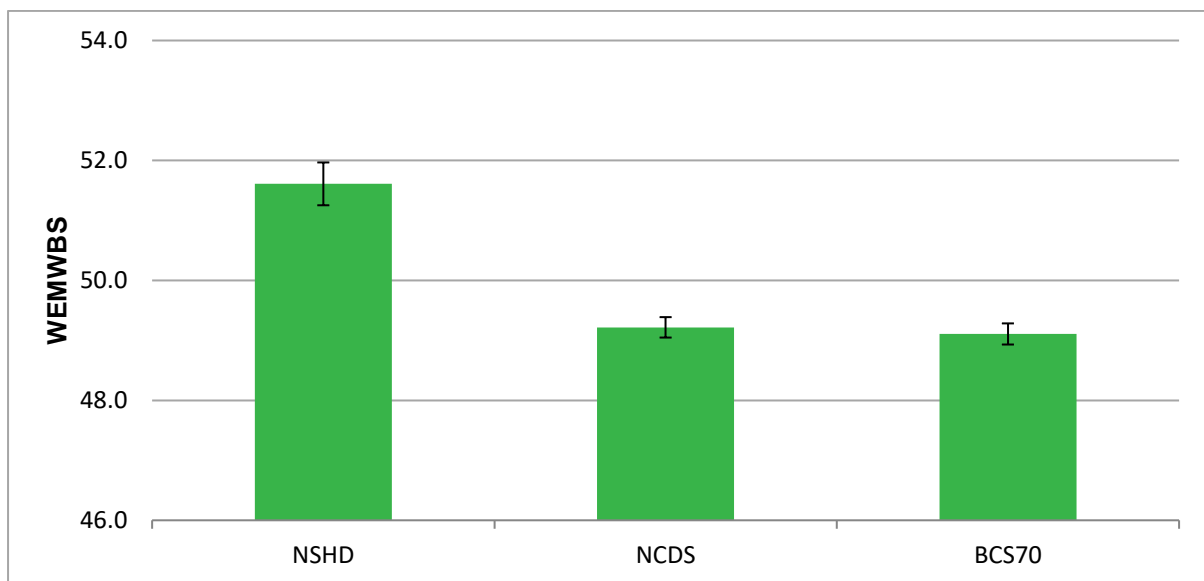
Adjusted for sex.

In summary, we found that childhood socio-economic disadvantage was strongly associated with poorer mental wellbeing in adulthood in BCS70, but this association was weaker in the other two studies. We also found that poorer quality of the parent-child relationships and poor parental mental health were strongly associated with poorer mental wellbeing in all three studies. This finding was consistent despite some differences in the measures. We also examined associations between childhood socio-economic disadvantage and parent-child relationships**.** These results are illustrated below.

Overcrowding in childhood and adult mental wellbeing

Figure 2 shows the mean sex-adjusted difference in wellbeing by overcrowding in the three studies. There were differences among the studies in the extent to which overcrowding in childhood was associated with adult mental wellbeing with the association being stronger among the later born cohorts. In NSHD, there was not a clear association between experiencing overcrowding in childhood and adult mental wellbeing, whilst in NCDS there was some association with those who lived in more overcrowded conditions having poorer mental wellbeing in adulthood than those who lived in accommodation where there was only one person per room. However, in the BCS70 there was a strong association between overcrowding in childhood and adult mental wellbeing, with those who lived in the most crowded conditions experiencing considerably lower levels of adult mental wellbeing compared to those who did not live in crowded conditions.

Figure 2: Adult mental wellbeing by number of occasions lacked household amenities in childhood
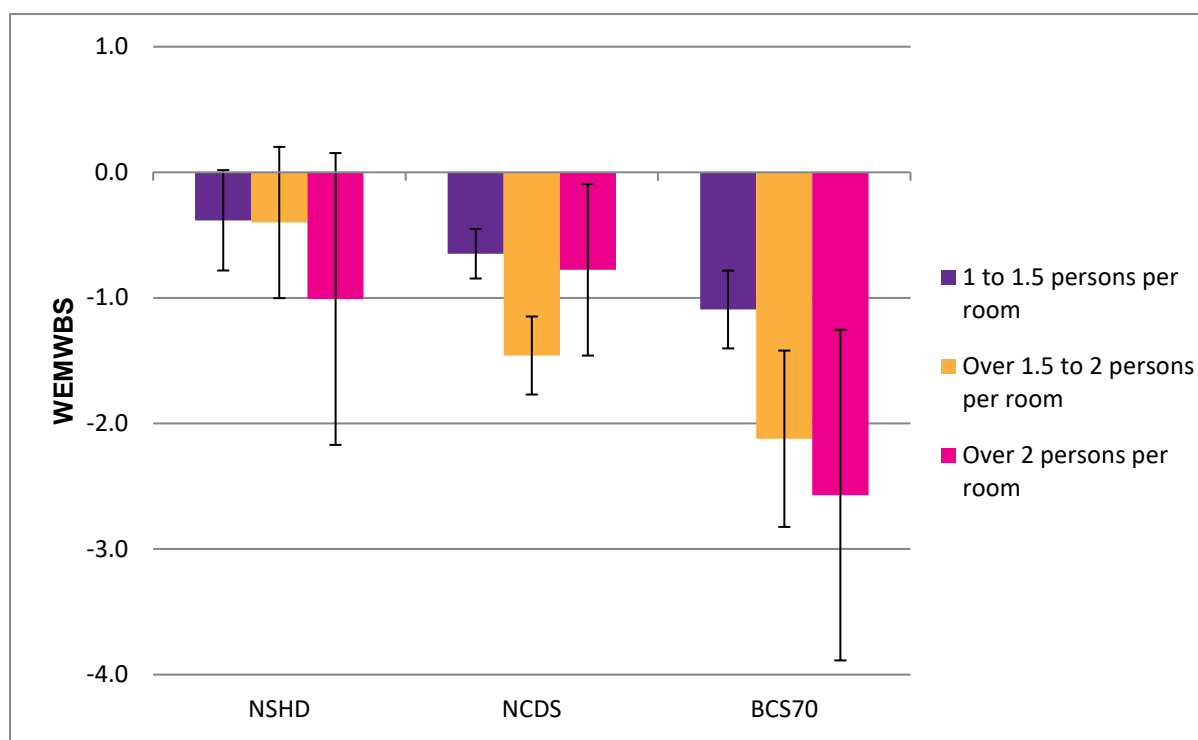
Reference category: up to 1 person per room. Adjusted for sex.

Parent-child relationships and adult mental wellbeing

Figure 3 shows the differences in adult mental wellbeing by parent-child relationships. NSHD and BCS70 measured parental care and overprotection using the Parental Bonding Instrument (Parker, Tupling, & Brown, 1979). NCDS did not use the parental bonding instrument and instead measures of how well the study member got on with their parents were used. In all three studies, there was an association between parental-child relationship quality and adult mental wellbeing. In NSHD and BCS70, those whose parents were more caring and less overprotective had higher levels of adult mental wellbeing than those whose parents were less caring and more overprotective. Similarly, in NCDS, those who said they got on well with their father or their mother had higher levels of adult mental wellbeing than those who did not get on with their parents.

Figure 1: Adult mental wellbeing by parent-child relationships
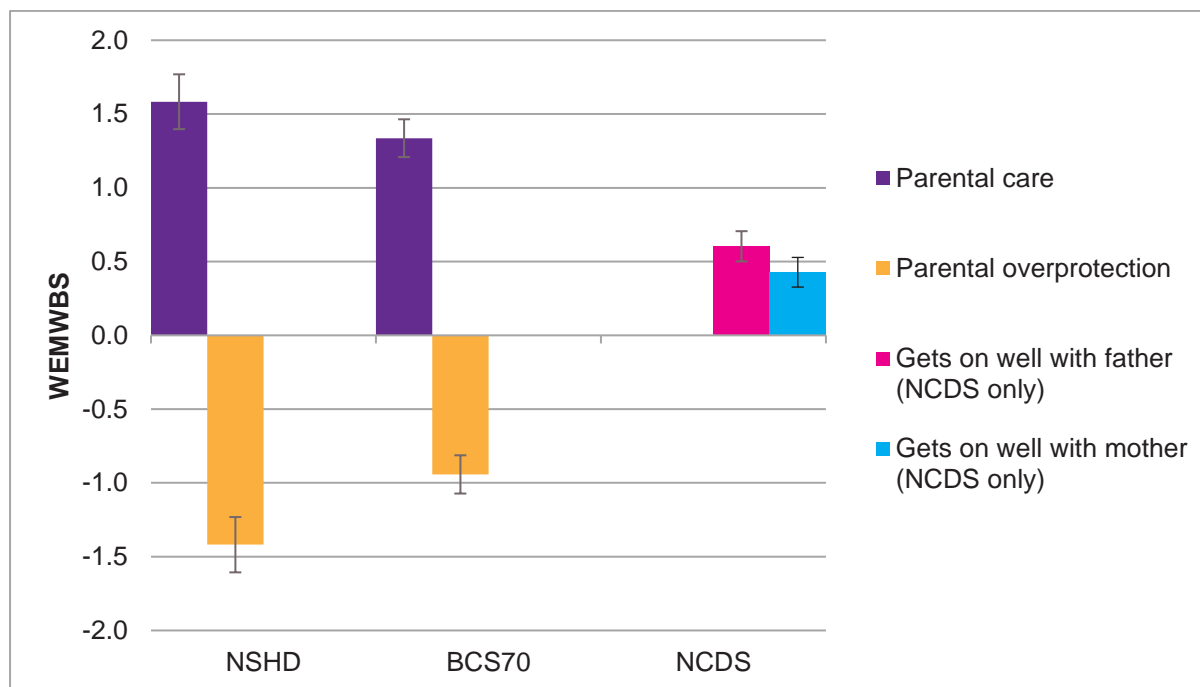
For NSHD and BCS70, the parental care scale runs from 'low parental care' to 'high parental care' and the overprotection scale runs from 'low parental overprotection' to 'high parental overprotection'. For NCDS only, the most comparable scale runs from 'doesn't get on well with parent' to 'gets on well with parent'. Estimates have been standardised. Adjusted for sex.

Father's social class and parent-child relationships

Figure 4 shows parent-child relationships by father's social class. Father's social class was measured in ridit scores, a technique which takes account of the population distribution across social class categories, enabling comparison over time (Mackenbach & Kunst, 1997). The graph shows the difference in parent-child relationship quality between those whose fathers were in the highest social class compared to those whose fathers were in the lowest social class.

In two of the studies, there was a positive social gradient in the association between father's social class and parent-child relationship quality. In BCS70, those whose fathers were in the most advantaged social class perceived their parents to be more caring (and less overprotective; data not shown here) than those whose fathers were in the least advantaged social class. In NCDS, those whose fathers were in the most advantaged social class were more likely to get on well with their fathers than those whose fathers were in the least advantaged social class, but in this cohort, there was no association between father's social class and how well the study member got on with their mother. In NSHD, there was no association between father's social class and parent-child relationships.

Figure 4: Parent-child relationships by father's social class
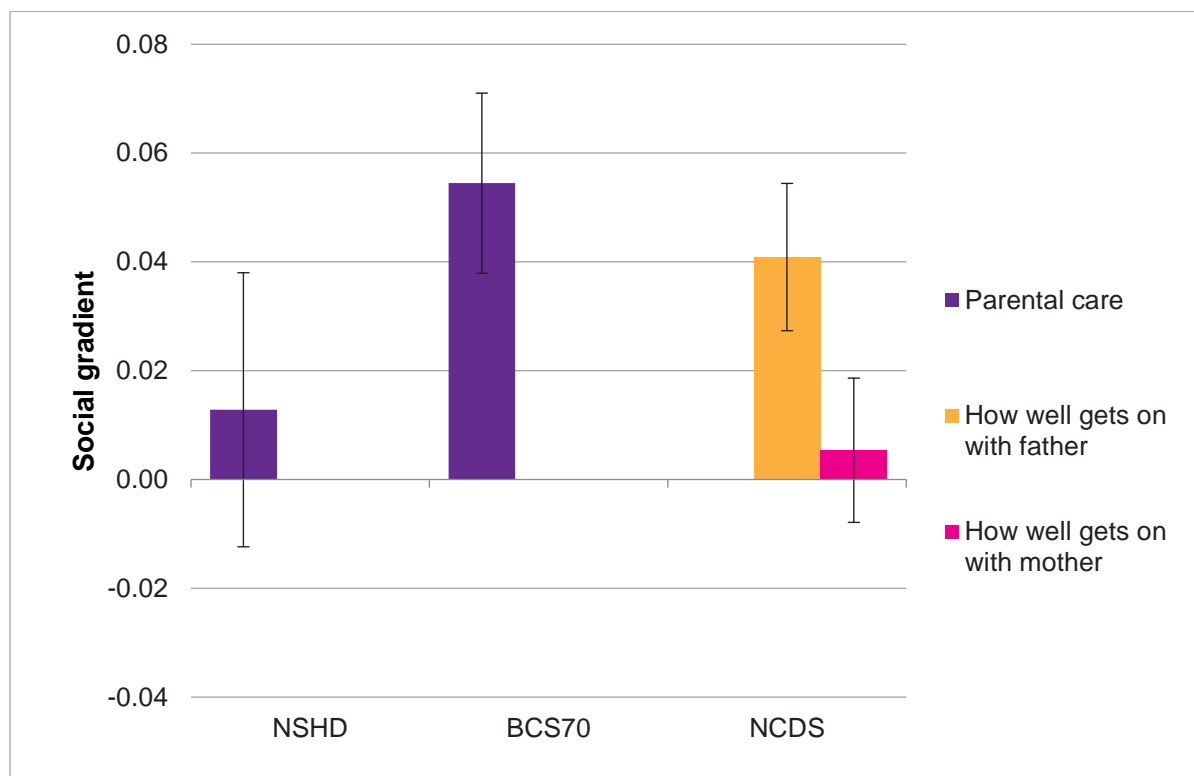
Reference category: Lowest father's social class (ridit score). Higher scores indicate a more positive social gradient. For NSHD and BCS70, the parental care scale runs from 'low parental care' to 'high parental care'. For NCDS only, the scale runs from 'does not get on well with parent' to 'does get on well with parent'. Estimates have been standardised. Adjusted for sex.

Parental mental health and adult mental wellbeing

Figure 5 shows adult mental wellbeing by maternal or family mental health. Each of the studies measured maternal or family mental health differently and therefore are not equivalent, but across all three studies those whose parents experienced poorer mental health during childhood also reported lower mental wellbeing in adulthood. There were differences in the strength of the association across the studies with a stronger association between parental mental health and adult mental wellbeing in NSHD and BCS70 than in NCDS.

Figure 5: Adult mental wellbeing by parental mental health
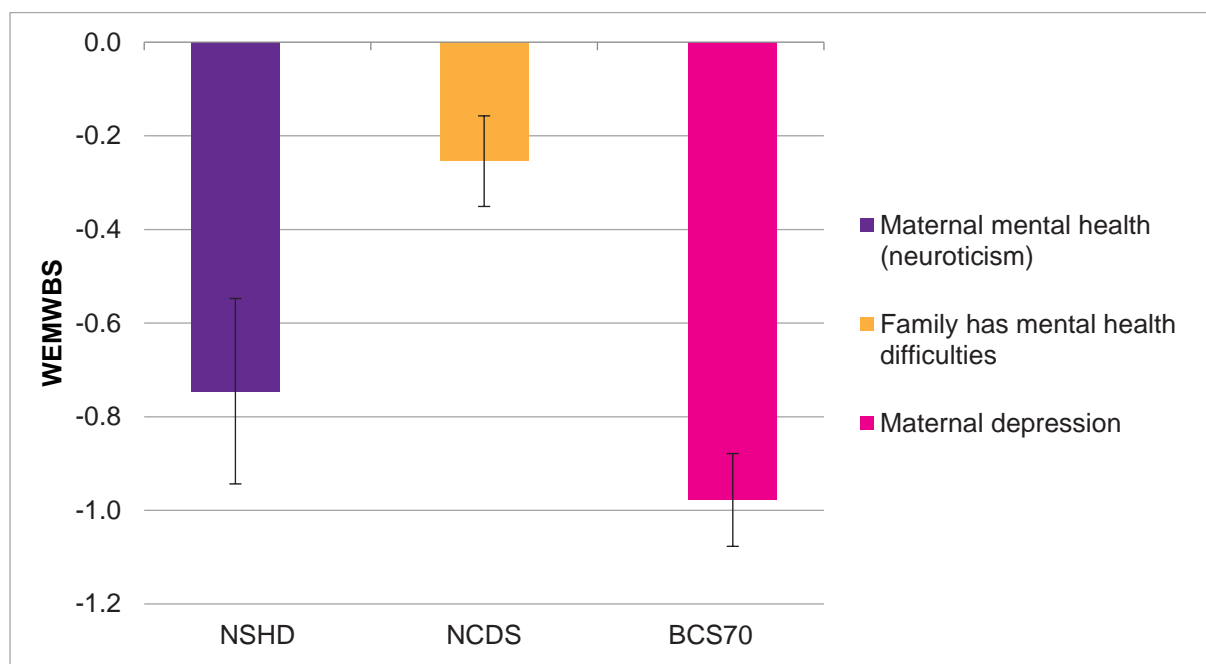
Coefficients are standardised. Adjusted for sex. In NSHD, maternal mental health was measured by the Maudsley Personality Inventory (Jensen, 1958). In NCDS health visitors assessed whether the family had mental health difficulties. In BCS70, mother's depression was measured using the malaise inventory (Rutter & Whitmore, 1970).

Harmonised variables description and source

This section details how the measures of the childhood environment were derived across the following domains:

- family socio-economic position;
- child rearing and parenting;
- family instability;
- parental health;
- child health; and
- wellbeing.

In our analyses, we also used father's social class and parental education. However, these variables are not included in this user guide as they are part of CLOSER work package 2 and are described within that documentation.

Family socio-economic position

Harmonised variable		
Variable name	crowd	
Variable description	Crowding in childhood - persons per room	
Description of derivation	Whether the study member experienced overcrowding in childhood, which is measured as the number of persons per room. The measure is a median score of overcrowding collected at different points between birth and age 11 in the NSHD and the NCDS, but in the BCS70 overcrowding was only collected at 5 years of age. For any cases in NSHD and NCDS which were missing data from one or more sweeps, the measure was derived using the sweeps where data was available.	
Variable code list	1	Up to 1
	2	Over 1 to 1.5
	3	Over 1.5 to 2
	4	Over 2
	-999	Missing value - item non-response
	-111	Missing value - non-response to sweeps
Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	Birth, 2, 4, 6, 8, & 11 years	CROW46 CROW48 CROW50 CROW52 CROW54 CROW57

NCDS	Birth, 7, & 11 years	n512 n607 n1683
BCS70	5 years	e228b

Harmonised variable		
Variable name	**ameni**	
Variable description	Number of occasions childhood accommodation lacked sole use of amenities - bath, hot water, kitchen	
Description of derivation	The derived variable captures whether the study member's family lacked access to each amenity (either sole use of a bath, a kitchen or hot water) in early childhood and at age 10/11. N.B. at age 10 in the BCS70, hot water was not included as one of the amenities, therefore it is assumed that everyone had access to hot water. If there was missing data at one age, then the measure was derived just using the data which was present at the other age. A flag **amenimiss** was created to show which cases this affected.	
Variable code list	0	No occasions
	1	1 occasion
	2	2 occasions
	-999	Missing value - item non-response
	-111	Missing value - non-response to sweeps
Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	2 &11 years	aml48 aml57
NCDS	7 & 11 years	n621 n1681
BCS70	5 & 10 years	e221 e224 e226 d3.1 d3.2

Harmonised variable		
Variable name	**tenure**	
Variable description	Accommodation owned or rented in childhood	
Description of derivation	This variable captures whether the study member was in rented or owned accommodation in early childhood and at age 10/11. This variable does not distinguish between accommodation rented privately and rented from the council.	
Variable code list	1	Rented at both time points
	2	Owned at one time point
	3	Owned at both time points
	-999	Missing value - item non-response

	-888	Don't know
	-111	Missing value - non-response to sweeps

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	2 & 11 years	own48 own57
NCDS	7 & 11 years	n200 n1152
BCS70	5 & 10 years	e220 d2

Harmonised variable		
Variable name	teenm	
Variable description	Had a teen mother at birth	
Description of derivation	Using the age of the mother when the study member was born. All those mothers under the age of 20 were identified as a teen mother.	
Variable code list	0	No
	1	Yes
	-999	Missing value - item non-response
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	Birth	MAB46
NCDS	Birth	n553
BCS70	Birth	bd1mage

Harmonised variable		
Variable name	teenf	
Variable description	Had a teen father at birth	
Description of derivation	Using the age of the father when the study member was born. All those fathers under the age of 20 were identified as a teen father.	
Variable code list	0	No
	1	Yes
	-999	Missing value - item non-response
	-222	Not applicable - no father *(BCS70 only)*
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	Birth	PAB46
NCDS	Birth	n494
BCS70	Birth	bd1fage

Child rearing and parenting

Harmonised variable		
Variable name	**brfed**	
Variable description	Whether breastfed	
Description of derivation	Details on whether the study member was breastfed collected between ages of 2 to 7 years. The details were given by the mother.	
Variable code list	1	Not breastfed
	2	Breastfed for under 1 month
	3	Breastfed for over 1 month
	-999	Missing value - item non-response
	-888	Don't know
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	2 years	BRE
NCDS	7 years	n222
BCS70	5 years	e020

Harmonised variable		
Variable name	**parint**	
Variable description	Parental interest in child's education	
Description of derivation	This variable measures how interested parents were in the study member's education. In NCDS and BCS70 the question was asked separately for the mother and for the father, but in the NSHD it was asked for both parents. To make the measure comparable with NSHD, the interest of the parent who was most interested in their child's education was used in NCDS and BCS70. If either parent in NCDS or BCS70 were missing data, then the response of the parent which had data was used.	
Variable code list	1	Very interested
	2	Some interest
	3	Little interest
	-999	Missing value - item non-response
	-888	Don't know

	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	11 years	TINT57
NCDS	7 years	N43 N44
BCS70	10 years	J097 J098

Harmonised variable	
Variable name	**carenshd** *(NSHD only)* **carebcs** *(BCS70 only)*
Variable description	Parental care (average across both parents), NSHD Parental care, BCS70
Description of derivation	N.B. there is no equivalent measure in the NCDS, and while comparable, the measures in NSHD and BCS70 cannot be deemed directly equivalent. Both the NSHD and the BCS70 contained a version of the parental bonding instrument (Parker et al., 1979), but the measures were slightly different on each study. The parental bonding instrument included in NSHD covered the quality of the relationship with each parent in the first 16 years of life and was asked retrospectively to the study member at age 43. The parental bonding instrument was included in BCS70 at age 16 and asked about both parents together. Two subscales were derived (Rodgers, 2009) – parental care and parental overprotection. There were 11 items capturing maternal care and 11 capturing paternal care in the NSHD and 7 items capturing parental care in the BCS70. All the parental care items in the parental bonding instrument were totalled to give a continuous measure which was then standardised. The parental care measures were averaged across both parents in NSHD. If one parent was missing data then the variable was derived just using the data which was available from the other parent. A flag, **carenshdmiss**, shows which cases were missing data from one or both parents. Standardised versions of the variable were derived using z-score transformations, and the variables stored as **carenshdz** and **carebcsz**.

Variable range & code list	*Unstandardised:* 0 (not caring) to 33 (very caring) *Standardised:* -3.73 to 1.501	NSHD
	Unstandardised: 0 (not caring) to 7 (very caring) *Standardised:* -2.647 to 1.154	BCS70
	-999	Missing value - item non-response
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	43 years	fcare mcare
NCDS	N/A	N/A
BCS70	16 years	gb1.3 gb1.5 gb1.6 gb1.7 gb1.8 gb1.10 gb1.11.

Harmonised variable	
Variable name	**overnshd** *(NSHD only)* **overbcs** *(BCS70 only)*
Variable description	Parental overprotection (average across both parents), NSHD Parental overprotection, BCS70
Description of derivation	See description for *carenshd* and *carebcs*. N.B. there is no equivalent measure in the NCDS. While comparable, the measures in NSHD and BCS70 cannot be deemed directly equivalent. The parental overprotection scale was derived from 13 items in NSHD and 4 items in BCS70. All the parental overprotection items in the parental bonding instrument were totalled to give a continuous measure which was then standardised. The parental overprotection measures were averaged across both parents in NSHD. If one parent in NSHD was missing data, then the variable was derived just using the data which was available from the other parent. A flag **overnshdmiss**

	shows which cases were missing data from one or both parents in NSHD. Standardised versions of the variable were derived using z-score transformations, and the variables stored as **overnshdz** and **overbcsz**.	
Variable range & code list	*Unstandardised:* 0 (not overprotective) to 34 (overprotective) *Standardised:* -2.103 to 3.616	NSHD
	Unstandardised: 0 (not overprotective) to 4 (overprotective) *Standardised:* -0.603 to 3.710	BCS70
	-999	Missing value - item non-response
	-11	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	43 years	moverp foverp
NCDS	N/A	N/A
BCS70	16 years	gb1.1 gb1.2 gb1.4 gb1.9

Related non-harmonised variables		
Variable name	**mowell** *(NCDS only)* **fawell** *(NCDS only)*	
Variable description	Gets on with mother/Gets on with father	
Description of derivation	At age 16, study members were asked to indicate their agreement with the statement "I get on well with my mother / father". They were asked separately about each parent on a scale from 1 to 5, with 1 being very true and 5 being very untrue. The categories have been changed and reverse coded into no, sometimes and yes.	
Variable code list	0	No
	1	Sometimes
	2	Yes
	-999	Missing value - item non-response

	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	N/A	N/A
NCDS	16 years	n2280 (mother)
		n2881 (father)
BCS70	N/A	N/A

Family instability

Harmonised variable		
Variable name	**divorce**	
Variable description	Parents divorced during study member's childhood	
Description of derivation	In NSHD, *divsbc,* which had been derived from interviews with the respondent at each childhood sweep, was used to identify if parental divorce occurred before the participant reached the age of 16. *Divsbc* measured whether parents had got divorced and what age the study member was. In NCDS and BCS70, a number of variables which collected information on change of circumstances since previous sweep and whether parental divorce was the cause were collated across multiple sweeps in childhood and were used to create the divorce variables. In both NCDS and BCS70, study members were also asked in adulthood whether their parents divorced and what age they divorced; if study members said that their parents divorced by the time they were 16 years old then they were set to divorced.	
Variable code list	0	Not divorced
	1	Divorced
	-999	Missing value - item non-response
	-888	Don't know
	-333	Not applicable - parents never lived together *(BCS70 only)*
	-222	Parent died / never lived with parents *(NCDS & BCS70)*
	-111	Missing value - non-response to all sweeps

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	Up to 16 years	divsbc
NCDS	Up to age 16 years	n321 n2372 n2376 n502827 n502828
BCS70	Up to age 16 years	e010a e010b e011 e011a e011b (1975) a5.3 a6.3 a8.5c a11.2f (1980) oa11.10 oa11.11 oa11.12 (1986) mapadiva mapadivb (2000)

Harmonised variable	
Variable name	**sepmum** (NSHD & NCDS) **sepmumbcs** (BCS only)
Variable description	Ever separated from mother
Description of derivation	Each of the studies collected information on whether the study member had ever been separated from their mother. In NSHD and NCDS, it included shorter term separation (e.g. one week or more) as well as long term separation, whilst in BCS70, it referred only to long-term separation including permanent separation from mother. For this reason, there are greater numbers in NSHD and NCDS reporting separation from mother than in BCS70. The BCS70 measure is in a separate derived variable as it is not equivalent to the NSHD and NCDS measures.

Variable code list	0	Never separated or separated for under one week *(NSHD & NCDS)* No *(BCS70 only)*
	1	Separated for one week or more *(NSHD & NCDS)* Yes *(BCS70 only)*
	-999	Missing value - item non-response
	-888	Don't know
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	4 years	set4652
NCDS	7 years	n658

BCS70	0 to 10 years	a5.5

Harmonised variable	
Variable name	**resmove**
Variable description	Number of residential moves in childhood
Description of derivation	Each of the studies collected information on the number of residential moves which had been experienced in childhood. In NSHD, information was collected from age 2 to 15. In NCDS, information was collected at age 16 about all residential moves from birth to age 16. In BCS70, residential moves were collected at age 10 about the number of addresses lived at since birth for 6 months or more. Each original variable on the 3 studies was derived into comparable categories.

Variable code list	0	None
	1	1-3
	2	4 or more
	-999	Missing value - item non-response
	-888	Don't know
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	15 years	totmov61
NCDS	16 years	n2492
BCS70	10 years	a11.1

Parental health

Harmonised variable	
Variable name	**hprobmoth**
Variable description	Mother had a health problem
Description of derivation	Information on whether parents had any health conditions was collected on each of the studies, but there were differences among the studies in how the information was collected. In NSHD and NCDS, the study member's parents were asked, when the study member was age 15 and age 11 respectively, whether each parent had any health conditions from a given list. There were some differences in the health conditions

		which were listed. In NSHD, the conditions comprised asthma, eczema, hay fever, chronic cough, rheumatism in joints, anaemia, nervous conditions, heart trouble, kidney trouble and any other conditions. In NCDS, the health conditions comprised respiratory conditions, psychiatric conditions, educationally subnormal (ESN), urogenital, alimentary, locomotor, neurological, infectious, special senses, cardiovascular, dermatological and any other condition. If the parent had any of the listed conditions in NSHD and NCDS, they were categorised as having a health condition. In BCS70, the measure did not list particular health conditions; instead parents were asked when study member was 10 years old whether they had had an illness since the study member was 5 years old.
Variable code list	0	No health problem
	1	Had health problem
	-999	Missing value - item non-response
	-222	Mother died
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	15 years	wc611
NCDS	11 years	n1406
BCS70	10 years	e3.1

Harmonised variable		
Variable name	hprobfath	
Variable description	Father had a health problem	
Description of derivation	See the description to *hprobmoth*.	
Variable code list	0	No health problem
	1	Had health problem
	-999	Missing value - item non-response
	-222	Father died
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	15 years	hc611
NCDS	11 years	n1415
BCS70	10 years	e3.2

Harmonised variable		
Variable name	mnhnshd *(NSHD only)* mnhbcs *(BCS70 only)*	
Variable description	Mother's mental health (Maudsley Personality Inventory - neuroticism scale only), NSHD Mother's mental health (Total malaise score), BCS70	
Description of derivation	In NSHD, when the study members were age 15, their mothers rated their own mental health using the Maudsley Personality Inventory (Jensen, 1958), which comprised 6 items measuring neuroticism. The scale on this runs from 0 to 6 with 0 reflecting low neuroticism and 6 reflecting high neuroticism. In BCS70, when the study members were age 10, their mothers were asked a series of questions which measured their own malaise using a 24-item malaise inventory (Rutter & Whitmore, 1970; Rodgers, Pickles, Power, Collishaw, & Maughan, 1999). The 24 items were scored from 0 to 100 with 0 reflecting seldom or never and 100 most of the time. The 24 items were added together to create a continuous scale from 1 to 2154, with a higher score reflecting higher levels of depression. For both studies, standardised versions, mnhnshdz and mnhbcsz, were subsequently derived using z-score transformations.	
Variable range & code list	*Unstandardised:* 0 to 6 *Standardised:* -0.995 to 2.70	NSHD
	Unstandardised: 1 to 2154 *Standardised:* -1.80 to 5.91	BCS70
	-999	Missing value - item non-response
	-111	Missing value - non-response to sweep
Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	15 years	MPI61
NCDS	N/A	N/A
BCS70	10 years	bd3mmal

Related non-harmonised variable	
Variable name	**famill** *(NCDS only)*
Variable description	Family difficulties due to mental illness/neurosis
Description of derivation	When the study member was aged 7, a health visitor assessed (without questioning the family) whether the family were experiencing difficulties due to mental illness or neurosis or not.

Variable code list	0	No
	1	Yes
	-999	Missing value - item non-response
	-888	Don't know
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	N/A	N/A
NCDS	7 years	n317
BCS70	N/A	N/A

Harmonised variable	
Variable name	**prmnh**
Variable description	Poor maternal / familial mental health
Description of derivation	This is derived from the maternal/familial mental health variables described already (*mnhnshd/bcs and famill*). For BCS70, *prmnh* is derived by dichotomisation of the source variable at the 3% cut point to reflect poor mental health, to be equivalent with NCDS, where 3% of families had poor mental health. For NSHD, dichotomisation was also performed, with values of 6 on the source scale deemed indicative of poor mental health.

Variable code list	0	Not poor
	1	Poor
	-999	Missing value - item non-response
	-888	Don't know
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	15 years	mnhnshd
NCDS	7 years	n317
BCS70	10 years	mnhbcs

Related non-harmonised variable		
Variable name	**srhmoth** *(NSHD only)*	
Variable description	Mother's self-rated health	
Description of derivation	When the study members were 15 years old mothers were asked to rate their own health.	
Variable code list	1	Excellent / good
	2	Average
	3	Not very good / bad / died
	-999	Missing value - item non-response
	-111	Missing value - non-response to sweep
Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	15 years	wh61
NCDS	N/A	N/A
BCS70	N/A	N/A

Related non-harmonised variable		
Variable name	**srhfath** *(NSHD only)*	
Variable description	Father's health (rated by mother)	
Description of derivation	When the study members were 15 years old mothers were asked to rate their husband's health.	
Variable code list	1	Excellent / good
	2	Average
	3	Not very good / bad / died
	-999	Missing value - item non-response
	-111	Missing value - non-response to sweep
Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	15 years	hh61
NCDS	N/A	N/A
BCS70	N/A	N/A

Child health

Harmonised variable	
Variable name	**lowbwt**
Variable description	Low birthweight
Description of derivation	The study member's weight was measured at birth either in pounds, ounces or grams. Low birth weight is defined as less than 2.5kg (or 5.5lb).

Variable code list	0	No
	1	Yes
	-999	Missing value - item non-response
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	Birth	mbwtu
NCDS	Birth	n646
BCS70	Birth	a0278

Harmonised variable	
Variable name	**schabs**
Variable description	Length of time absent from school due to illness
Description of derivation	On all three studies there were measures of school absence due to ill health; however, it was collected differently across the three studies. In NSHD, the data came from school administrative records, which recorded any absences due to ill health from age 6 to age 10. In NCDS and BCS70, parents were asked how long the study member had been away from school due to ill health in the past 12 months. Consequently, there could be some misreporting in NCDS and BCS70 compared to NSHD.

Variable code list	1	Less than 1 week
	2	1 week to 1 month
	3	Over 1 month up to 3 months
	4	Over 3 months
	-999	Missing value - item non-response
	-888	Don't know
	-222	Not applicable - didn't go to school *(NCDS & BCS70)*
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	6 to 10 years	AILS5256
NCDS	11 years	n1301
BCS70	10 years	b22.1

Harmonised variable	
Variable name	**intnshd** *(NSHD only)* **intncds** *(NCDS only)* **intbcs** *(BCS70 only)*
Variable description	Internalising behaviour in childhood
Description of derivation	NSHD collected information from teachers on internalising disorder in childhood, using the Pintner Aspects of Personality Inventory, which provides a measure of the child's personality along the dimensions of neuroticism and extroversion/introversion (Pintner & Forlano, 1938; Pintner, Loftus, Forlano, & Alster, 1937). Items which measure internalising symptoms were identified using factor analysis (Xu, 2013). NCDS and BCS70 collected data on symptoms of affective disorder (including both internalising and externalising behaviours) at age 16 using the Rutter scale (Rutter, 1967). There were differences in the scale between NCDS and BCS70. The NCDS Rutter scale comprised more items than did BCS70 (26 items compared to 19). In NCDS, the scale was rated by teachers, whilst in BCS70 it was rated by parents, at age 16. To maximise comparability with NSHD, the items in the scales in NCDS and BCS70 were separated out into those which measured internalising behaviours and those which measured externalising behaviours using factor analysis. Details of the factor analysis is provided in the appendices (Appendix 1). While comparable, the internalising variable cannot be deemed directly equivalent across the studies and so has been labelled differently for each study. Standardised versions of the variable were derived using z-score transformations, and the variables stored as **intnshdz**, **intncdsz**, and **intbcsz**.

| **Variable range & code list** | *Unstandardised:*
-4.53 to 6.14
Standardised: | NSHD |

-3.255 to 4.286	
Unstandardised: 0 to 17 *Standardised:* -0.766 to 8.339	NCDS
Unstandardised: 0 to 16 *Standardised:* -1.129 to 6.284	BCS70
-999	Missing value - item non-response
-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	13 & 15 years	IN13EFA IN15EFA
NCDS	16 years	n2302 n2303 n2306 n2307 n2308 n2312 n2313 n2317 n2318 n2319
BCS70	16 years	pa5.6 pa5.7 pa5.11 pa5.12 pa5.13 pa5.16 pa5.17 pa5.9

Harmonised variable	
Variable name	**extnshd** *(NSHD only)* **extncds** *(NCDS only)* **extbcs** *(BCS70 only)*
Variable description	Externalising behaviour in childhood
Description of derivation	See the variable description for *intnshd*, *intncds*, and *intbcs*. Again, while comparable, the externalising variable similarly cannot be deemed directly equivalent across the studies and so has been labelled differently for each study. Standardised versions of the variable were derived using z-score transformations, and the variables stored as **extnshdz**, **extncdsz**, and **extbcsz**.

Variable range & code list	*Unstandardised:* -3.85 to 6.06 *Standardised:* -2.791 to 4.145	NSHD
	Unstandardised: 0 to 30 *Standardised:* -0.619 to 5.586	NCDS
	Unstandardised: 0 to 22 *Standardised:* -0.742 to 7.384	BCS70
	-999	Missing value - item non-response
	-111	Missing value - non-response to sweep

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	13 & 15 years	EX13EFA EX15EFA
NCDS	16 years	n2296 n2297 n2299 n2300 n2301 n2304 n2309 n2310 n2311 n2314 n2315 n2316 n2320 n2321
BCS70	16 years	pa5.1 pa5.2 pa5.3 pa5.4 pa5.5 pa5.8 pa5.14 pa5.15 pa5.18 pa5.10 pa5.19

Wellbeing

Harmonised variable	
Variable name	**totwemwbs**
Variable description	Total WEMWBS score
Description of derivation	On each of the studies, the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS), a validated instrument (Tennant et al., 2007) which measures both hedonic and eudemonic elements of wellbeing, was collected. The WEMWBS scale comprises 14 items and these have been added up to form a score ranging from 14 (low wellbeing) to 70 (high wellbeing). On each of the studies, WEMWBS was collected in a self-completion questionnaire.
	14 to 70	Continuous scale

Variable range & code list	-999	Missing value - item non-response *(NSHD)*
		Missing value - 4 or more item non-responses to WEMWBS *(NCDS & BCS70)*
	-111	Missing value - non-response to sweep or not selected for sweep *(NSHD)*
		Missing value - non-response to sweep *(NCDS & BCS70)*

Source variables		
Study	**Age(s)**	**Variable name(s)**
NSHD	60 to 64 years	WELLBA09ri WELLBB09ri WELLBC09ri WELLBD09ri WELLBE09ri WELLBF09ri WELLBG09ri WELLBH09ri WELLBI09ri WELLBJ09ri WELLBK09ri WELLBL09ri WELLBM09ri WELLBN09ri
NCDS	50 years	N8SCQ3A N8SCQ3B N8SCQ3C N8SCQ3D N8SCQ3E N8SCQ3F N8SCQ3G N8SCQ3H N8SCQ3I N8SCQ3J N8SCQ3K N8SCQ3L N8SCQ3M N8SCQ3N
BCS70	42 years	B9SCQ31A B9SCQ31B B9SCQ31C B9SCQ31D B9SCQ31E B9SCQ31F B9SCQ31G B9SCQ31H B9SCQ31I B9SCQ31J B9SCQ31K B9SCQ31L B9SCQ31M B9SCQ31N

Datasets

Study	No. of cases	Dataset name	Data licencing
NSHD	5,362	nshd_closer_wp9	Special licence
NCDS	18,558	ncds_closer_wp9	End user licence
BCS70	19,050	bcs70_closer_wp9	End user licence

Licencing

All datasets are available from the UK Data Service (UKDS) at https://www.ukdataservice.ac.uk/get-data/key-data/cohort-and-longitudinal-studies. All users of the data need to be registered with the UKDS (details of how to do this are available at https://www.ukdataservice.ac.uk/get-data/how-to-access/registration. Data under the End User Licence can be downloaded once the access conditions have been ticked. Data under the Special Licence will need to request permission and complete a form. Once that has been accepted the data will be available to download.

Linkage to other data from a study

The datasets are linkable to other data released by CLOSER using the CLOSER Serial Number ('closerid') variable. This is a pseudonymised participant identifier that is included in all datasets from the CLOSER harmonisation work packages.

If you wish to link the harmonised data to other data from NCDS and BCS70, the original participant identifiers from these studies are also included in the harmonised datasets for those studies.

If you wish to link other NSHD data to the harmonised dataset for that study, contact NSHD at: https://skylark.ucl.ac.uk/NSHD/doku.php.

Dataset structure

Variable name	Label	Format	Values	Note
closerid	CLOSER ID	string (8)		
ncdsid/bcsid	NCDS serial number/BCS70 research case identifier	string (7)		In the case of NSHD, requests for the original participant identifiers should be directed to the studies themselves
stid	Study identifier	string (10)	NSHD / NCDS / BCS70	Note this has been kept as string to avoid divergences in how studies are encoded across CLOSER work packages (as these may comprise different sets of studies)
inf	Inflation factor to adjust for stratified sample updated 11/10/96	integer	1 - 2992 non-manual and agricultural [Inflation factor to adjust for stratified sample] Updated 11.10.96, 2 - 2370 manual excluding agricultural	For NSHD only
sex	Sex of study member	integer	1 - Male, 2 - Female	
crowd	Mean crowding score in childhood - persons per room	integer	1 - Up to 1, 2 - Over 1 to 1.5, 3 - Over 1.5 to 2, 4 - Over 2	
ameni	Number of occasions childhood accommodation lacked sole use of amenities - bath, hot water, kitchen	integer	0 - No occasions, 1 - 1 occasion, 2 - 2 occasions	
amenimiss	Missing data from one sweep (or more) on lack of amenities	integer	0 - Not missing, 1 - Missing	
tenure	Accommodation owned or rented in childhood	integer	1 - Rented at both time points, 2 - Owned at one time point, 3 - Owned at both time points	
teenm	Had a teen mother at birth	integer	0 - No, 1 - Yes	
teenf	Had a teen father at birth	integer	0 - No, 1 - Yes	
brfed	Whether breastfed	integer	1 - Not breastfed, 2 - Breastfed for under 1 month, 3 - Breastfed for over 1 month	

parint	Parental interest in child's education	integer	1 - Very interested, 2 - Some interest, 3 - Little interest	
carenshd/ carebcs	Parental care	numeric		For NSHD & BCS70 only
carenshdz/ carebcsz	Parental care - standardised	numeric		For NSHD & BCS70 only
carenshdmiss	Missing data on parental care from father or mother, NSHD	integer	0 - Not missing, 1 - Missing	For NSHD only
overnshd/ overbcs	Parental overprotection	numeric		For NSHD & BCS70 only
overnshdz/ overbcsz	Parental overprotection - standardised	numeric		For NSHD & BCS70 only
overnshdmiss	Missing data on parental overprotection from father or mother, NSHD	integer	0 - Not missing, 1 - Missing	For NSHD only
mowell	Gets on with mother	integer	0 - No, 1 - Sometimes, 2 - Yes	For NCDS only
fawell	Gets on with father	integer	0 - No, 1 - Sometimes, 2 - Yes	For NCDS only
divorce	Parents divorced during study member's childhood	integer	0 - Not divorced, 1 - Divorced	
sepmum/ sepmumbcs	Ever separated from mother	integer	0 - Never separated or separated for under one week (NSHD & NCDS)/No (BCS70 only), 1 - Separated for one week or more (NSHD & NCDS)/Yes (BCS70 only)	
resmove	Number of residential moves in childhood	integer	0 - None, 1 - 1-3, 2 - 4 or more	
hprobmoth	Mother had a health problem	integer	0 - No health problem, 1 - Health problem	
hprobfath	Father had a health problem	integer	0 - No health problem, 1 - Health problem	
srhmoth	Mother's self-rated health	integer	1 - Excellent / good, 2 - Average, 3 - Not very good / bad / died	For NSHD only
srhfath	Father's health (rated by mother)	integer	1 - Excellent / good, 2 - Average, 3 - Not very good / bad / died	For NSHD only
mnhnshd/ mnhbcs	Mother's mental health (Maudsley Personality Inventory - neuroticism scale only), NSHD/Mother's	numeric		For NSHD & BCS70 only

	mental health (Total malaise score), BCS70			
mnhnshdz/ mnhbcsz	Mother's mental health (Maudsley Personality Inventory - neuroticism scale only) - standardised, NSHD/Mother's mental health (Total malaise score) - standardised, BCS70	numeric		For NSHD & BCS70 only
famill	Family difficulties due to mental illness/neurosis	integer	0 - No, 1 - Yes	For NCDS only
prmnh	Poor maternal / familial mental health	integer	0 - Not poor, 1 - Poor	
lowbwt	Low birthweight	integer	0 - No, 1 - Yes	
schabs	Length of time absent from school due to illness	integer	1 - Less than 1 week, 2 - 1 week to 1 month, 3 - Over 1 month up to 3 months, 4 - Over 3 months	
intnshd/ intncds/ intbcs	Internalising behaviour in childhood	numeric		
intnshdz/ intncdsz/ intbcsz	Internalising behaviour in childhood - standardised	numeric		
extnshd/ extncds/ extbcs	Externalising behaviour in childhood	numeric		
extnshdz/ extncdsz/ extbcsz	Externalising behaviour in childhood - standardised	numeric		
totwemwbs	Total WEMWBS score	numeric		

Appendix 1

Factor analysis for internalising and externalising symptoms in childhood in NCDS and BCS70

Factor analysis was run in STATA 14.2 in NCDS and BCS70 to identify which items of the Rutter behaviour scales (Rutter, 1967) could be categorised as externalising behaviours and internalising behaviours in childhood. The results of the factor analysis are shown in Table 1.

The factor analysis yielded two factors: externalising and internalising symptoms. Factor 1 represents externalising symptoms and Factor 2 represents internalising symptoms. The table also shows the corresponding factor loadings. Overall the factor analysis gave similar results in NCDS as it did in BCS70 – although two items in BCS70 ("twitches / mannerisms" and "bites nails") had higher factor loadings for externalising than internalising, but were classified as internalising symptoms to remain consistent with NCDS. From the factor analysis the items were categorised into externalising and internalising symptoms. The items which comprised the externalising and internalising measures in NCDS and BCS70 are listed in Table 2 and Table 3, respectively.

The internalising and externalising measures are not directly equivalent in the two cohorts as there are more items included in the measures in NCDS compared to BCS70. In NCDS, 15 items comprised the externalising measure and 10 the internalising measure, whilst in BCS70, 11 items comprised the externalising measure and 8 the internalising measure.

Table 1: Factor analysis results for internalising and externalising symptoms in NCDS and BCS70

NCDS					BCS70				
Variable name	Description	Factor 1: Externalising	Factor 2: Internalising	Uniqueness	Variable name	Description	Factor 1: Externalising	Factor 2: Internalising	Uniqueness
n2296	Restless, difficulty staying seated	0.773		0.334	pa5.1	Very restless	0.424		0.665
n2297	Truanting	0.749		0.378					
n2298	Squirmy fidgety	0.708		0.367	pa5.2	Squirmy /fidgety	0.420	0.314	0.605
n2299	Destroys property	0.922		0.227	pa5.3	Destroys belongings	0.807		0.376
n2300	Fights very quarrelsome	0.901		0.230	pa5.4	Fights with others	0.719		0.436
n2301	Not much liked by other children	0.526	0.383	0.397	pa5.5	Not much liked by others	0.437	0.304	0.596
n2302	Often worries about many things		0.786	0.481	pa5.6	Often worried		0.774	0.446

n2303	Tends to be on own solitary		0.633	0.605	pa5.7	Rather solitary		0.431	0.766
n2304	Irritable touchy flies off the handle	0.766		0.359	pa5.8	Irritable quick to anger	0.461	0.358	0.509
n2306	Twitches		0.590	0.485	pa5.11	Twitches / mannerisms	0.280	0.259	0.788
n2307	Sucks thumb or finger		0.500	0.652	pa5.12	Sucks thumbs	0.141	0.168	0.930
n2308	Bites nails or fingers		0.380	0.707	pa5.13	Bites nails	0.234	0.131	0.900
n2309	School absences	0.596		0.497					
n2310	Disobedient	0.988		0.129	pa5.14	Disobedient	0.784		0.360
n2311	Cannot settle for more than a few moments	0.782		0.290	pa5.15	Cannot settle	0.552		0.513
n2312	Fearful of new situations		0.736	0.465	pa5.16	Fearful / afraid of new things		0.654	0.603

n2313	Fussy / over particular		0.594	0.701	pa5.17	Fussy / over particular		0.492	0.763
n2314	Often tells lies	0.899		0.165	pa5.18	Tells lies	0.865		0.318
n2315	Has stolen	0.777		0.405	pa5.10	Takes others things /steals	0.868		0.336
n2316	Unresponsive / inert	0.566		0.552					
n2317	Complains of aches and pains		0.525	0.553					
n2318	Tears on arrival		0.603	0.442	pa5.9	Miserable/unhappy	0.323	0.509	0.487
n2319	Has a stutter or stammer		0.540	0.702					
n2320	Resentful, aggressive when corrected	0.892		0.266					
n2321	Bullies other children	0.936		0.233	pa5.19	Bullies others	0.789		0.392

Table 2: Items comprising the externalising measure in NCDS and BCS70

NCDS		BCS70	
Variable name	**Variable label**	**Variable name**	**Variable label**
n2296	Restless, difficulty staying seated	pa5.1	Very restless
n2297	Truanting		
n2298	Squirmy fidgety	pa5.2	Squirmy /fidgety
n2299	Destroys property	pa5.3	Destroys belongings
n2300	Fights very quarrelsome	pa5.4	Fights with others
n2301	Not much liked by other children	pa5.5	Not much liked by others
n2304	Irritable touchy flies off the handle	pa5.8	Irritable quick to anger
n2309	School absences		
n2310	Disobedient	pa5.14	Disobedient
n2311	cannot settle for more than a few moments	pa5.15	Cannot settle
n2314	Often tells lies	pa5.18	Tells lies
n2315	Has stolen	pa5.10	Takes others things /steals
n2316	Unresponsive / inert		
n2320	Resentful, aggressive when corrected		
n2321	Bullies other children	pa5.19	Bullies others

Table 3: Items comprising the internalising measure in NCDS and BCS70

NCDS		BCS70	
Variable name	**Variable label**	**Variable name**	**Variable label**
n2302	Often worries about many things	pa5.6	Often worried
n2303	Tends to be on own solitary	pa5.7	Rather solitary
n2306	Twitches	pa5.11	Twitches / mannerisms
n2307	Sucks thumb or finger	pa5.12	Sucks thumbs
n2308	Bites nails or fingers	pa5.13	Bites nails
n2312	Fearful of new situations	pa5.16	Fearful / afraid of new things
n2313	Fussy / over particular	pa5.17	Fussy / over particular
n2317	Complains of aches and pains		
n2318	Tears on arrival	pa5.9	Miserable/unhappy
n2319	Has a stutter or stammer		

Appendix 2

Derivation code

These are supplied in two parts, alongside the documentation, as part of the CLOSER Work Package 9 data download from UKDS (i.e. alongside the harmonised data files).

- ○ The within-work package (WP) harmonisation code is provided as separate SPSS syntax files (one per study), and these are named as follows:
    - nshd_closer_wp9_harmonisation.sps
    - ncds_closer_wp9_harmonisation.sps
    - bcs_closer_wp9_harmonisation.sps
- ○ Additional processing performed on the datasets to standardise the metadata format across the CLOSER work packages is provided as separate SPSS syntax files (one per study). These are named as follows:
    - nshd_closer_wp9_standardisation.sps
    - ncds_closer_wp9_standardisation.sps
    - bcs_closer_wp9_standardisation.sps

Source files

Files from which the derivations were made are:

Study	Age	Data Source
NSHD	All	Provided by study
NCDS	Birth	http://doi.org/10.5255/UKDA-SN-5565-2
	7	
	11	
	16	
	33	http://doi.org/10.5255/UKDA-SN-5567-1
	50	http://doi.org/10.5255/UKDA-SN-6137-2
BCS70	Birth	http://doi.org/10.5255/UKDA-SN-2666-2
	5	http://doi.org/10.5255/UKDA-SN-2699-4
	10	http://doi.org/10.5255/UKDA-SN-3723-7
	16	http://doi.org/10.5255/UKDA-SN-3535-4
	29	http://doi.org/10.5255/UKDA-SN-5558-3
	42	http://doi.org/10.5255/UKDA-SN-7473-2

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