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out-of-home care: How are they doing?**

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Evidence from the UK Millennium Cohort Study. Teenage children of mothers who experienced out-of-home care: How are they doing?

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Abstract

It is well documented that care-leavers tend to experience more problematic post-16 transitions and outcomes compared to their peers, but less is known about the intergenerational transmission of disadvantages to their children. This research addresses several of the key areas of concern identified in the 2013 Care Leaver Strategy – education, employment, health including health- and risky-behaviours, crime – to help inform strategies to assist agencies working with care-leavers, in particular care-leavers who became parents and who might be struggling across domains. This study draws on the UK Millennium Cohort Study to examine the experiences of 16-18-year-old children of mothers who experienced out-of-home care during their childhoods (n=305) in comparison to children whose mothers were not in care (n=18,505). After accounting for the teenager's sex, age, ethnicity, results in public examinations at age 16 and family socio-economic background measures together with the level of area deprivation they encounter, we find that the teenage children of care-experienced mothers have similar aspirations regarding attending university or entering a professional occupation, and they were just as likely to be in employment, education or training at age 17 as their peers. However, they were more likely than their peers to experience a range of poorer health outcomes and health behaviours: they reported higher levels of behavioural and mental health problems, including self-harm and suicide attempts; higher levels of illegal drug use and more had been cautioned by the police. The wellbeing of the most disadvantaged families in our society clearly needs to be better addressed if we are to minimise the intergenerational transmission of disadvantage associated with care experience being passed on to children in future generations.

Key words: out-of-home care; mothers; disadvantage; intergeneration transmission

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Background

The key objective of this paper is to add new evidence, from a national UK-wide study, on the intergenerational transmission of disadvantage that is passed from mothers who experienced out-of-home care (OHC) during their childhood or adolescence to their children, and to assess to what extent their teenage children differ from other teenagers across a range of outcomes.

This research addresses some of the key areas of concern identified in the 2013 Care Leavers Strategy (HM Government, 2013), the 'Putting Children First' and 'Keep on Caring' initiatives which are the foundation of current policy (DfE, 2016, HM Government, 2016). Specifically regarding education outcomes and post-16 transitions into further education, training or employment (EET), physical health and mental wellbeing, health or 'risky' behaviours and experience of being a victim of crime and contact with the police. Our findings highlight the need for effective strategies for integrated service delivery to assist agencies working with care-leavers and families who are struggling across domains.

Literature Review

In England there are currently around 80,000 children in local authority care, representing 0.7% of the total child population (Department for Education [DfE], 2022a), and it is well documented that care-experience is associated with more problematic post-16 transitions and poorer adult outcomes. Care leavers tend to have a high risk of exposure to adverse psychosocial circumstances across their life course, i.e., risks encountered in their family of origin and their own experiences (Parsons & Schoon, 2021; Sacker, Lacey, Maughan, & Murray, 2022), together with enduring stigma and low expectations held by of both educators and social care professionals (Mannay et al., 2017; Roberts, 2021). In 2013 the UK Government published the Care Leaver Strategy identifying key areas where care-leavers needed better, more joined up and on-going support: education, employment, finance, health, housing, and

access to the justice system. Although there are several interventions and agencies² whose aim is to improve the early transitions and life chances of those with care-experience, today's care-leavers continue to achieve lower grades in public examinations at age 16 (DfE, 2019a; DfE 2019b; HCEC, 2022), and are more likely to have been refused admission to 'good' or 'outstanding' Ofsted rated schools (HCEC, 2022). In 2021 just 7.2% of looked-after children achieved the grade 5 'good pass' threshold in English and mathematics GCSEs, compared to 40.1% of non-looked-after children (HCEC, 2022). Regarding higher education, only 13% of care-leavers progressed to higher education by age 19 in 2019/20, compared to 43% of all other pupils (DfE, 2022b). Additionally, children in care and care-experienced young adults are consistently over-represented in the criminal justice system (Berman & Dar, 2013; Kennedy, 2013; McMahon & Fields, 2015; Crawford et al.' 2018; Yoon et al., 2018), are vulnerable to exploitation (Hallett, 2016) and have a higher incidence of substance misuse, physical, behavioural and mental health problems (Tarren-Sweeney & Vetere, 2013; DfE, 2019a). Research also shows that girls who have been in care have sexual relations at an earlier age and have a greater risk of teenage pregnancy and teenage motherhood compared to girls who had not spent any time in the care system (Roberts et al., 2017; Svoboda, et al., 2012; Knight, et al., 2006).

An enduring idea in UK government policy is that there are a minority of 'problem' families for whom disadvantage persists across generations, with care-experience being one such problem. However, although relatively high proportions of parents with care experience have their own children removed to care (Foster et al., 2015), the majority do not (Centre for Social Justice, 2015; Roberts et al., 2019). Unpublished research by the authors based on the 1970 British Cohort Study (BCS70), found that although more likely than children of mothers who had no care experience, most children with a mother who had experienced care do not end up in care themselves: 11.3% compared

² For example: pause.org.uk, becomecharty.org.uk, careleaversfoundation.org, careleavers.com

to 2.9%. Nonetheless, care-experience can cast a long shadow, suggesting the potential of intergenerational transmission of trauma (Parsons & Schoon, 2022). Care leavers who become parents are among the most disadvantaged in our society, as many negative outcomes associated with care experience are also related to the reasons of being placed into care (DfE 2019a). One of the most vulnerable times for women after leaving care is when they themselves enter motherhood, as they have experienced disrupted parental attachments, have (probably) less family support to draw on, and may also face difficulties in resolving issues from their own childhood as they now see it through the lens of having their own child (Dregan & Gulliford, 2012; Maxwell et al., 2011; Pryce & Samuels, 2010; Roberts 2021). Our earlier research has profiled the more challenging socio-economic and housing conditions that care-leavers who became mothers experience (Parsons & Schoon, 2021), the lower academic performance of their children in the pre-school years and academic attainment at age 16 (Parsons, et al., 2022). This report focuses on the role of maternal OHC experience in influencing a range of psycho-social outcomes in their teenage children aged 16-18 years - a research area that demands further attention.

Research aim: profiling the psycho-social adjustment of teenage children of mother with OHC experience across different domains

Comparing outcomes of children of care leaver mothers across a wide range of domains we aim to gain a more comprehensive understanding of the key challenges these families are facing. We will profile **early post-16 education transitions** (GCSE results and economic activity (i.e., being in education, employment or training (EET)), **and higher education and occupation aspirations of the young people** (how likely they think it is that they will go to university, occupation aspirations, and what they want to have achieved by age 30), their **physical health and mental health problems** (e.g., general health, longstanding illnesses, SDQ (Goodman, 1997; 2001), symptoms of depression (Kessler, 2003), self-harm and suicide, mental wellbeing (Tennant, 2007), **health behaviours** (e.g., [underage] smoking, use of alcohol and recreational drugs),

relationships and sexual activity (e.g., had a boy/girlfriend, had sex, had unprotected sex, been/made someone pregnant), **misconduct and experience of crime** (being a victim of misconduct/crime, contact with the police).

Data and Methods

Millennium Cohort Study

The Millennium Cohort Study (MCS) is a multi-purpose ongoing longitudinal study of approximately 19,000 babies born to families living in the UK between September 2000 and January 2002 (Plewis, 2007; Connelly & Platt, 2014; Joshi & Fitzsimons, 2016). Data has been collected when the children were aged around 9 months, 3, 5, 7, 11, 14 and 17 when approximately 10,700 study members participated. Here we draw on information collected from personal interviews administered to parents of the cohort children at child age 9 months and 3 years, and child interview and self-completion questionnaires at age 17 (University of London, 2021, 2022a, 2022b). Information collected includes a wide range of robust socio-economic, employment and qualification details, together with information on, health, health-behaviour, wellbeing and contact with the police.

Analytic sample

Of the 18,552 families who first took part in wave 1 or the 692 new families introduced at wave 2, our analytic sample comprises of 18,810 families. In earlier research which provides a descriptive profile of mothers by experience of OHC (Parsons & Schoon, 2021), the sample was restricted to families where the birth mother was the main respondent and provided information on her experience of out-of-home care and ethnicity. For the families who took part at wave 1 *and* wave 2, these were further restricted to the main respondent being the birth mother at both time-points. Of the 18,810 birth mothers in the analytic sample, 305 (1.6%) mothers had experienced out-of-home care before they were 17. For this research we draw on the same sample of mothers examining outcomes of their children when they were interviewed in 2018. The mean age of the children was 17.2, ranging from 16.1 to 18.3.

Multiple Imputation

As all longitudinal studies, MCS suffers attrition over time, and in 2018 the response rate for the whole UK sample was 57%. We used Multiple Imputation (MI) to deal with attrition and item non-response to restore sample representativeness, adopting a chained equations approach (White, Royston & Wood, 2011) under the assumption of ‘missing at random’ (MAR), which assumes that the most important predictors of missing data are included in our models. To maximise the plausibility of the MAR assumption the most important predictors of missing data are included in our models to further reduce bias and retain power (see Mostafa & Wiggins, 2015; Mostafa et al., 2020; Silverwood et al., 2020). All reported analyses are averaged across 25 replicated data sets based upon Rubin’s Rule for the efficiency of estimation under a reported degree of missingness across the whole data of around 0.25 (Little & Rubin, 2014). Missingness in the variables ranged from less than 1% in many of the wave 1 measures, to 65.6% for occupation aspirations at wave 7. (See Appendix Table A1 for the level of missingness in all variables included in our analyses.)

The analyses were additionally weighted to adjust for the survey’s stratified clustered sampling design (Plewis, 2007).

Key Measure: experience of out-of-home care (parental)

Experience of out-of-home care (OHC) was identified with two questions included in the parent interview when the child was aged nine months (wave 1) and age three years (wave 2 for new respondents): ‘Before the age of 17, did you spend any time living away from both of your parents?’ If ‘yes’, a follow-on question asked, ‘Where did you mainly live during this time?’³. Parents who had spent time in a children’s home run by either a

³ Response options to the question ‘Where did you mainly live during this time?’: Local authority children's home; Voluntary society children's home; Children's home - not sure which type; Local authority foster parents; Voluntary society foster parents; Foster parents - not sure which type; Boarding school; Living with relatives; Prison/Young Offenders Institute/Borstal; Some other place.

local authority or voluntary society or with foster parents, were coded as having been in out-of-home care.

The 305 (1.6%) mothers with OHC experience in MCS had an age range of 15-45 years at baseline interview, being born between 1955 and 1985 and experiencing care systems and policies covering the 1950s-2000.

Analytic strategy

We first describe the association between maternal OHC experience and a range of outcomes for their teenage children at age 16-18 within different domains, as discussed. We then regress each measure on mother OHC experience, adjusting for the teenager's sex (male versus female), age, ethnic minority status (white versus other), their academic attainment at age 16 in GCSE (or equivalent) examinations (0-4 v 5+ grade 4-9) and their family socio-economic background. The selected measures build on our earlier research (see Parsons et al., 2022) which shows that when accounting for differences in socio-economic background, teenagers of a parent with OHC experience who live in England were no less likely than their peers to have achieved 5+ grade 4-9 GCSEs. In the current study we control for mothers highest qualification level (below NVQ2 v NVQ2 or higher), being part of a workless household (working versus workless), housing tenure (own versus rented) and an assessment of area deprivation that the families encounter in the area where they live in, as captured by the Index of Multiple Deprivation (top 8 versus bottom 2 deciles). We run logit models for the majority binary outcome measures and report odds ratios (ORs) adjusted for the individual and family confounders. For the outcomes measures that have a continuous score, we run OLS regressions and report unstandardised coefficients. Given the large number of outcomes covered, we present the results graphically to optimise readability. The complete regression tables are included in the appendix.

Results

Table 1 shows the direct association between characteristics of the teenagers and their family background and maternal OHC experience. The findings suggest that teenagers were equally distributed in terms of sex, ethnicity and age irrespective of whether their mother had experienced OHC, but teenagers with a mother with OHC experience were less likely to have gained 5+ grade 4-9 GCSEs (or equivalent). These results are direct associations without taking into account the socio-demographic control variables mentioned above. They were also more likely to be part of a workless household, to live in rented housing in a deprived area and to be less likely to have a mother with NVQ2 or higher qualifications.

Table 1: Teenager's individual and family background characteristics by mother OHC experience

	Mother No OHC	Mother OHC
	Proportion	Proportion
Individual Characteristics		
Female	0.48	0.49
Ethnic minority	0.13	0.13
Age (mean)	17.2	17.2
Gained 5+ grade 4-9 GCSEs (or equivalent)	0.59	0.37
Family SES		
Workless household	0.18	0.50
Mother NVQ2 or higher qualifications	0.77	0.46
English +/- or only Other Language spoken	0.11	0.04
Rented housing	0.38	0.82
Live in bottom two deciles of area deprivation	0.25	0.49
<i>N(100%)=</i>	<i>18,505</i>	<i>305</i>

Hopes and expectations for the future

Table 2 shows the direct association between maternal OHC experience and the hopes and aspirations of their teenage children without controls. The findings suggest that in comparison to their peers, teenagers with a mother who had OHC experience reported,

on average, lower expectations of going to university, but they were as likely to aspire to a professional occupation, were as likely to be in education, employment or training (EET) when interviewed, and had similar expectations of what they will achieve by age 30.

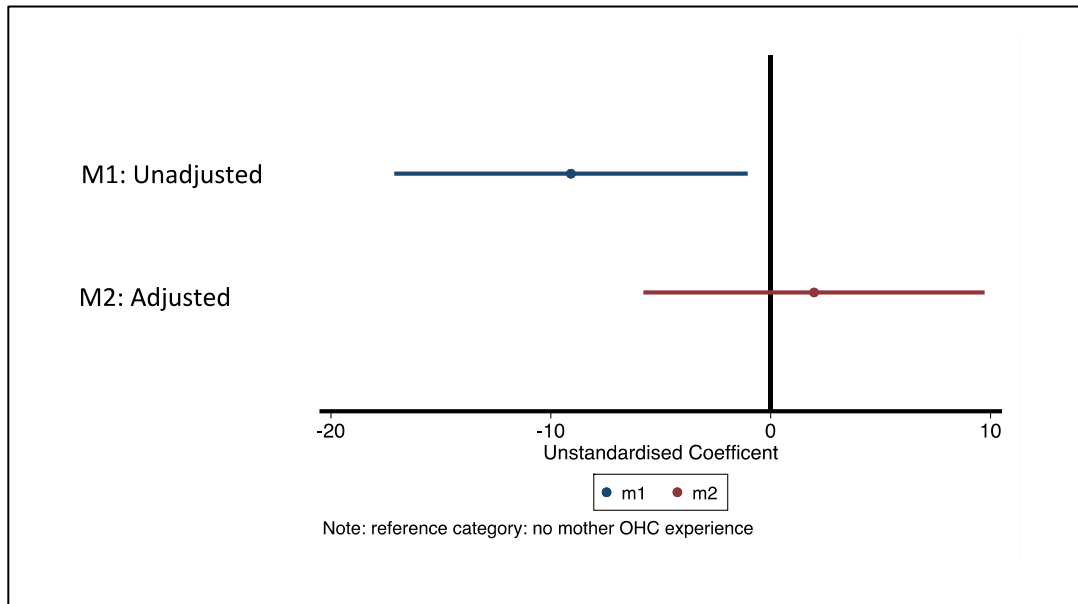
Table 2: Teenage university and occupation aspirations; expectation of achievements by age 30 by mother OHC experience

	Mother No OHC	Mother OHC
	Proportion	Proportion
How likely CM will go to university: 0-100% [mean]	54.48	45.40
In education, employment or training (at interview)	0.93	0.91
In education or training (at interview)	0.90	0.86
Don't know what job want to do	0.10	0.07
Want to have a prof/man job	0.38	0.30
<u>What expect to have achieved by age 30</u>		
Own home	0.74	0.64
Have a good car	0.64	0.52
Earn a lot money	0.46	0.40
Have a worthwhile job	0.74	0.70
Have children	0.50	0.53
Have a partner or be married	0.74	0.73
To be famous or made a name for self	0.12	0.10
Achieved in sport, art or travel	0.25	0.28
<i>N(100%)=</i>	18,505	305

Bold: differences significant: $p < .05$ [95% CIs do not overlap; OLS coefficient for mother OHC exp]

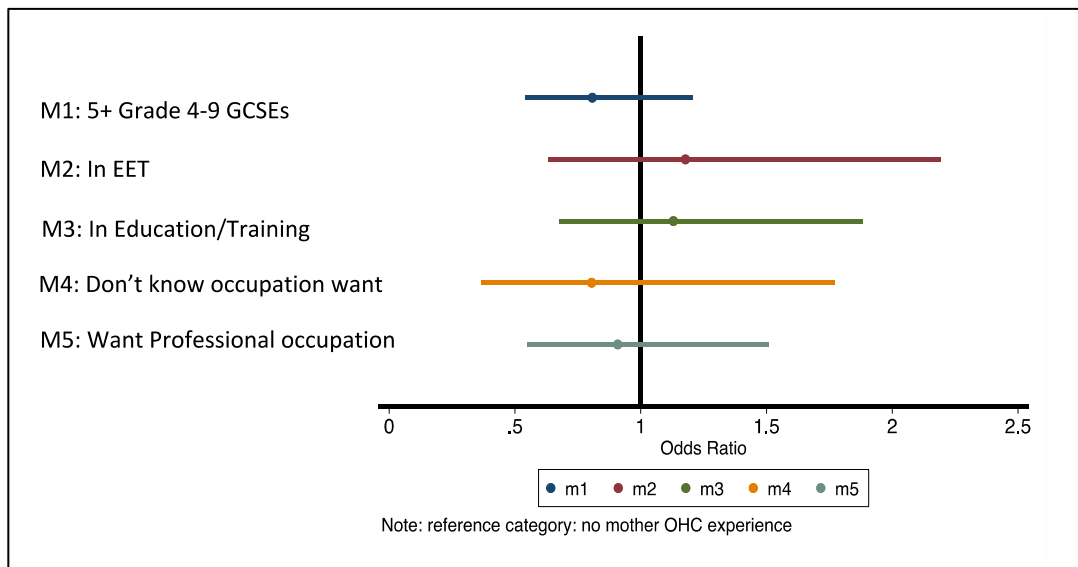
Figure 1a-1c shows the associations between the outcomes and mother OHC experience after adjusting for the teenager individual and family background characteristics mentioned above. The findings suggest that once these factors were controlled for teenagers of mothers with OHC experience showed similar expectations for higher education participation than their peers (Figure 1a) and they remained no less likely to be in EET or to hold professional occupation aspirations (Figure 1b).

Figure 1a: Teenage expectation of going to university: OLS coefficient for teenagers with a mother with OHC experience [adjusted for individual and family background characteristics]



Note: Models are adjusted for sex, ethnicity, age, GCSE attainment, working status of family, mother's highest qualification, housing tenure and area deprivation.

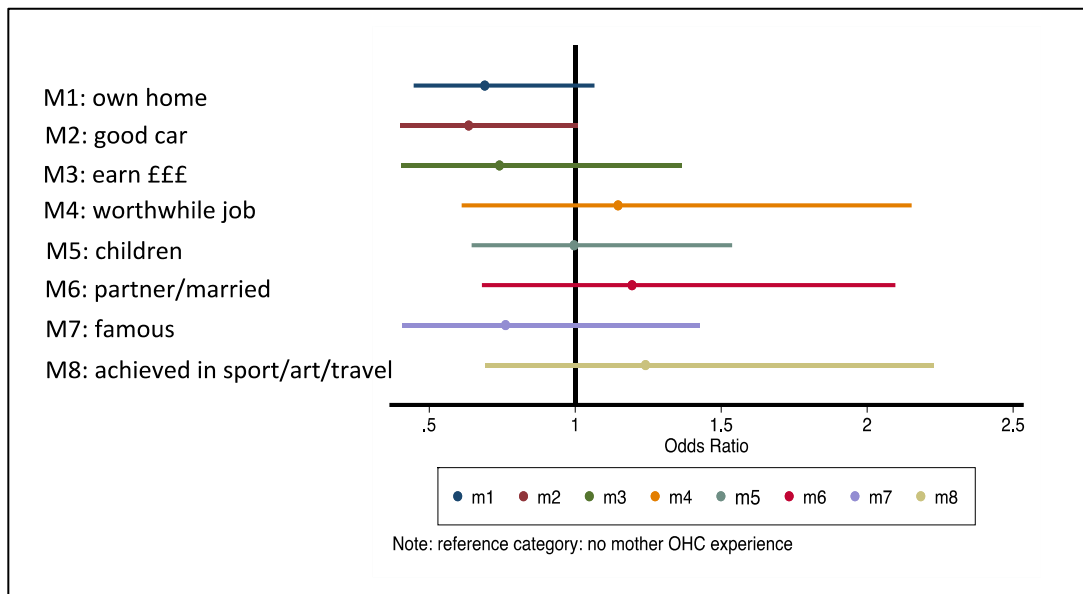
Figure 1b: Proportions in Education, Employment or Training and future occupation aspirations: ORs for teenagers with a mother with OHC experience [adjusted for individual and family background characteristics]



Note: Models are adjusted for sex, ethnicity, age, GCSE attainment, working status of family, mother's highest qualification, housing tenure and area deprivation. GCSE attainment model adjusted for sex, ethnicity, age, working status of family, mother's highest qualification, housing tenure and area deprivation.

Across the range of ‘adult achievement’ outcomes they expect to achieve by age 30, Figure 1c shows that after controlling for individual and family background characteristics they remained to be as likely to expect to own their own home, to have a ‘good car’ and showed similar expectations of earning a lot of money, having a worthwhile job, having a partner and/or children, to be famous or to have achieved or be recognised in artistic area (sport, travel or art). (See Appendix Table A2a – A2c for full regression results.)

Figure 1c: What teenagers think they will have achieved by age 30: ORs for teenagers with a mother with OHC experience [adjusted for individual and family background characteristics]



Note: Models are adjusted for sex, ethnicity, age, GCSE attainment, working status of family, mother’s highest qualification, housing tenure and area deprivation

Health, behaviour and mental wellbeing

We consider a wide range of outcomes in this section, including established scales of mental well-being, depression and behaviour problems, which are detailed in Box 1.

Table 3 shows the direct association between maternal OHC experience and indicators of their teenaged children’s health and mental wellbeing without controls. The findings suggest that compared to their peers, teenagers of mothers with OHC experience report higher levels of depression; poorer mental wellbeing; conduct and hyperactivity behaviour problems (SDQ). More have a longstanding illness, and have been told by a doctor that they have depression, and have received treatment for depression. They are also more likely to have self-harmed and attempted suicide.

Table 3: Teenage mental and physical health; behaviour problems; self-harm and suicide attempts by having a mother with OHC experience

	Mother No OHC	Mother OHC
	Proportion	Proportion
Warwick Edinburgh Mental Wellbeing scale: 7-35 [mean]	22.40	21.49
Kessler (depression) scale: 0-24 [mean]	7.37	9.24
Kessler (high levels of depression: 13+)	0.16	0.27
Told by a doctor that they have depression	0.10	0.21
Currently being treated for depression	0.02	0.06
Poor or fair general health	0.07	0.10
Longstanding illness	0.19	0.30
SDQ Emotional problems [CM reported]	0.13	0.18
SDQ Conduct problems [CM reported]	0.05	0.11
SDQ Hyperactivity problems [CM reported]	0.15	0.27
SDQ Peer problems [CM reported]	0.04	0.08
SDQ Pro-Social problems [CM reported]	0.04	0.07
Self-harmed: scale 0-6 [mean]	0.43	0.72
Self-harmed: any	0.26	0.38
Attempted suicide	0.07	0.16
<i>N(100%)</i>	18,505	305

Bold: differences significant: $p < .05$ [95% CIs do not overlap; OLS coefficient for mother OHC exp]

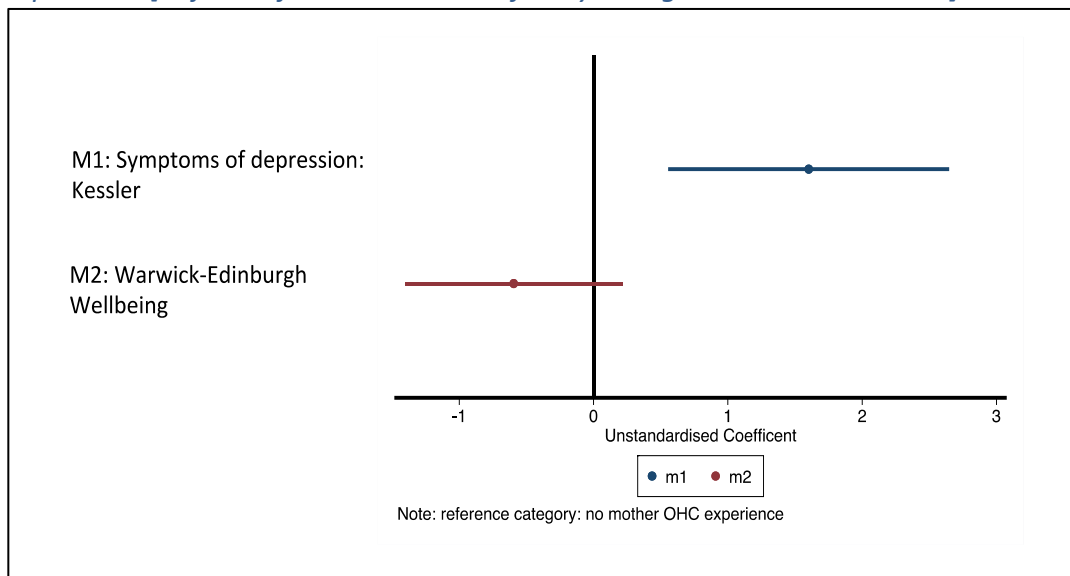
Box 1: Scales used for the assessment of mental health.

Warwick-Edinburgh Mental Wellbeing Scale (Tennant et al., 2007).
Each question in the 7-item (shorter) Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) has 5 response categories: 'none of the time', 'rarely', 'some of the time', 'often' and 'all of the time'. Responses are summed to provide a single score with a range of 7-35. The original 14-item WEMWBS was developed to enable the measuring of mental wellbeing in the general population. The items are all worded positively and cover both feeling and functioning aspects of mental wellbeing, thereby making the concept more accessible. The scale has been widely used nationally and internationally for investigating the determinants of mental wellbeing. The mean score for the overall sample is 22.4 (95% CI 22.2-22.5)
Kessler K6 scale (Kessler et al., 2003).
The six-item Kessler Psychological Distress (K6) scale is an abbreviated version of the K10. Each question pertains to an emotional state and response choices are based on five-point Likert-type scale ranging from 0 (<i>none of the time</i>) to 4 (<i>all of the time</i>). Scores range from 0-24, with a cut-off of 6+ indicates moderate psychological distress; 13+ serious psychological distress. Using the 13+ cut-off, 16% of teenagers in the overall sample display signs of serious psychological distress.
Strengths and Difficulties Questionnaire. Goodman (1997, 2001).
Behaviour problems were assessed from teenager self-reports on the Strengths and Difficulties Questionnaire [SDQ]. The SDQ is widely validated cross-nationally and cross-culturally for use in non-clinical settings. The SDQ includes 25 measures comprising five scales of five items each. For each negative attribute, the teenager is asked to say whether it is 'not true' (0), 'somewhat true' (1) or 'certainly true' (2) about their behaviour, with scores reversed for positive attributes. We use the four problem behaviour scales, conduct, hyperactivity, peer and emotional problems, and the non-problems scale of pro-social behaviour. Each behaviour scale ranges from 0-10 but can be dichotomised to indicate 'abnormal' behaviour. A score of 7+ indicates emotional or hyperactivity problems; 6+ peer problems; 5+ conduct problems; and <5 pro-social problems (Youth In Mind, 2016). In each binary variable no problems are coded as 0, behaviour problems as 1.

Figure 2a and 2b shows the associations between the age 17 outcomes after taking into account the teenager's individual and family background characteristics. Many differences remained. Compared to their peers, teenagers with a mother with out-of-home care experience were more likely to self-report hyperactivity behaviour problems and poorer mental wellbeing, indicated in terms of a higher number of depressive symptoms on the Kessler K6 scale. They were also more likely to have been told by a doctor that they have depression and have received treatment for depression. They were also more likely to self-harm and to have attempted suicide. It is white teenage girls and those with fewer good grade exam passes in public examinations at age 16

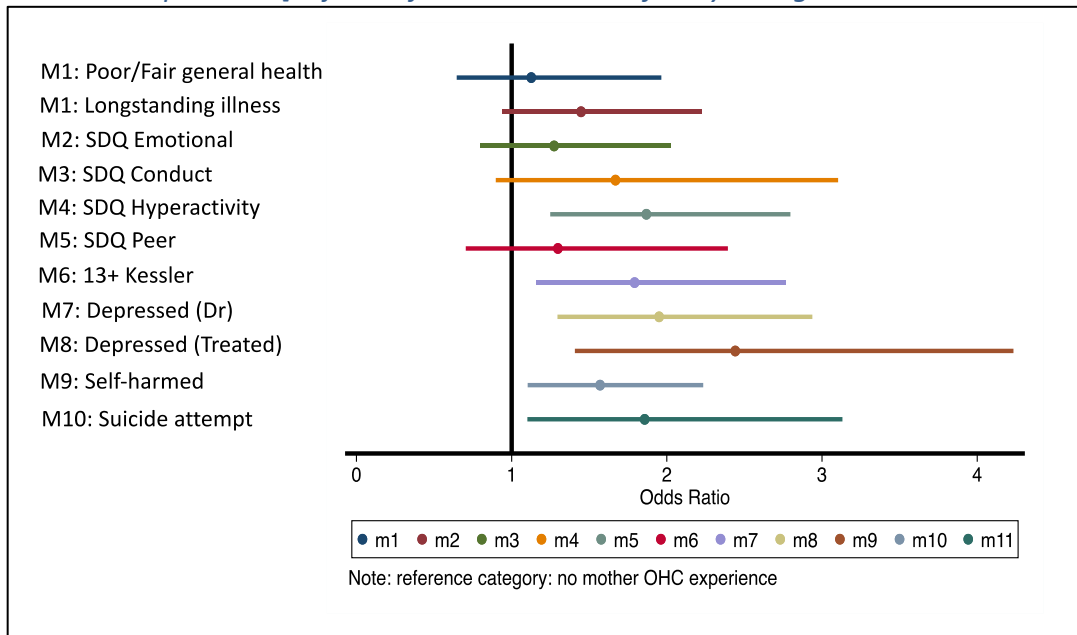
living in rented housing who are most at risk of depression, self-harm and suicide. The higher proportion of teenagers with a mother with OHC experience reporting a longstanding illness or conduct behaviour problems was attenuated by the other characteristics included in the modeling, specifically poor performance in age 16 examinations and living in rented housing. (See Appendix Table A3a and A3b for full regression results.)

Figure 2a: Mental wellbeing: OLS coefficient for teenagers with a mother with OHC experience [adjusted for individual and family background characteristics]



Note: Models are adjusted for sex, ethnicity, age, GCSE attainment, working status of family, mother's highest qualification, housing tenure and area deprivation

Figure 2b: Health, wellbeing and behaviour problems: ORs for teenagers with a mother with OHC experience [adjusted for individual and family background characteristics]



Note: Models are adjusted for sex, ethnicity, age, GCSE attainment, working status of family, mother's highest qualification, housing tenure and area deprivation.

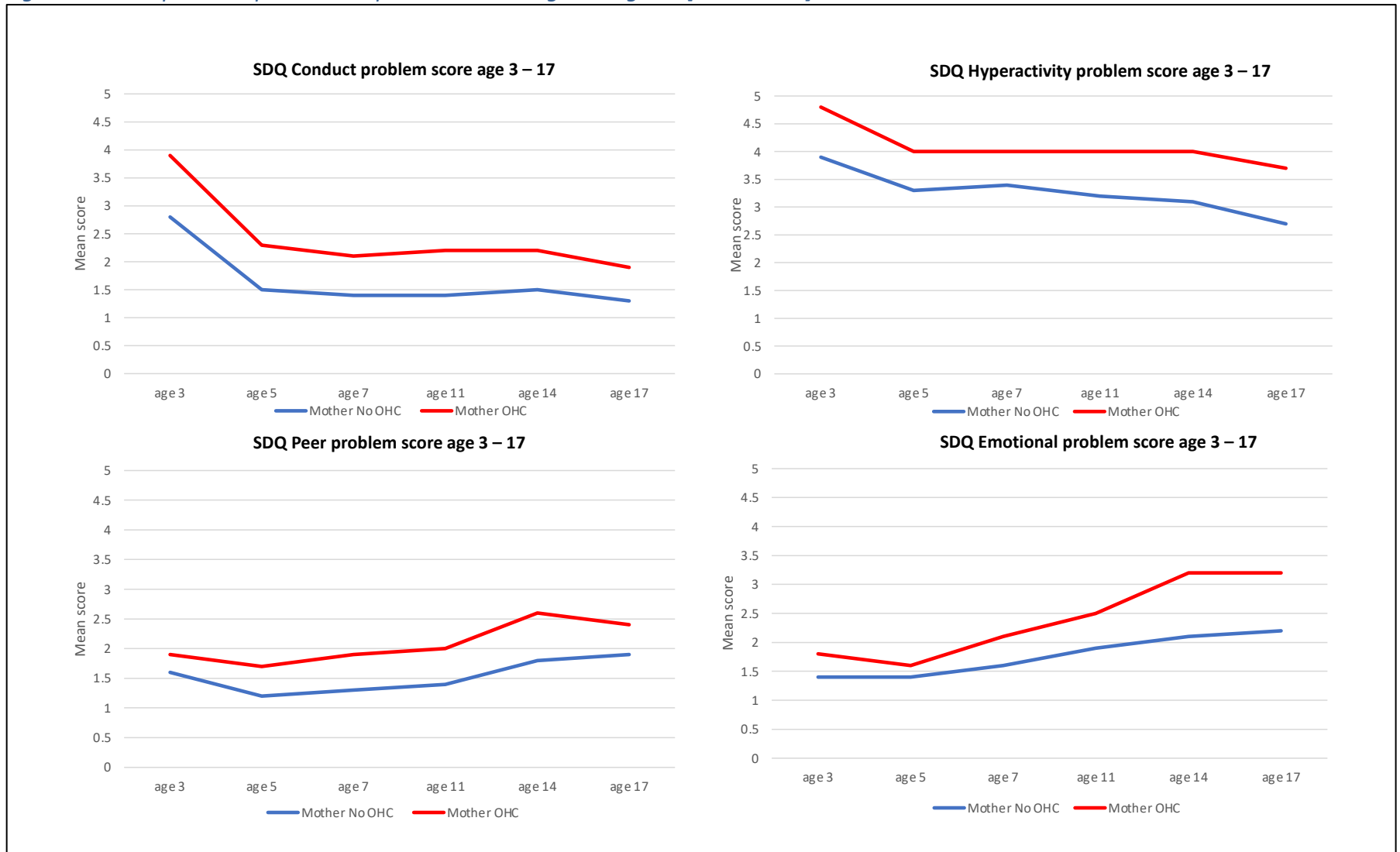
Developmental pre-cursors of teenage mental health

Given the high incidence of mental ill health among children of OHC experienced mothers, we felt it was important to look more into when these problems emerge and how this might differ by mother's OHC status. A great strength of the MCS is that it has collected parental reports of their child's behaviour on the SDQ scales at each wave of data collection from age 3 to age 17. In the section above, we examined teenager self-reports of their behaviour on the SDQ scales.

In figure 3 we see that at each age, children of mothers with OHC experience have higher mean scores on all four problem SDQ scales. The gap in mean scores remains very consistent over time for conduct and hyperactivity problems. There is a suggestion of an increase in the gap in peer problems by mother's OHC status as the children enter their teenage years, and the gap in the average number of emotional problems increases steadily from age 7 to age 14, to then seemingly plateauing at age 17. The

data suggests that during puberty there is an increase in emotional problems (and also peer problems), while the other problem behaviours (conduct and hyperactivity) recede. Patterns were very similar by sex. (See Figure A1 in the appendix.)

Figure 3: Mean parent reported SDQ problem scores age 3 – age 17 [no controls]



Health behaviours: smoking, alcohol use and drug taking

Table 4 shows the direct association between indicators of the teenager's health behaviours and maternal OHC experience without controls. The findings suggest that a higher proportion of teenagers of mothers with OHC experience have ever smoked, started smoking when they were younger than age 15 and to be current smokers. They are also more likely to have vaped, but not being a current vaper. In terms of alcohol consumption, more than 8 in 10 of all teenagers had tried alcohol with around 4 in 10 having their first alcoholic drink before age 15, but there were no differences by mother OHC experience. In terms of illegal drug use, higher proportions of teenagers of mothers with OHC experience had taken drugs but were not more likely to be a current user. The increased proportion of ever having taken drugs refers to cannabis use and not to the use of harder drugs such as cocaine, ecstasy or ketamine. However, it is important to note that early cannabis use has been associated with a decline in psychological development and worsening mental health (Volkow, 2016; Cooper & Williams, 2018), together with being thought as a 'gateway drug' to the use of harder drugs (Williams, 2020), although conflicting evidence exists on this (e.g. Jorgensen & Wells, 2022).

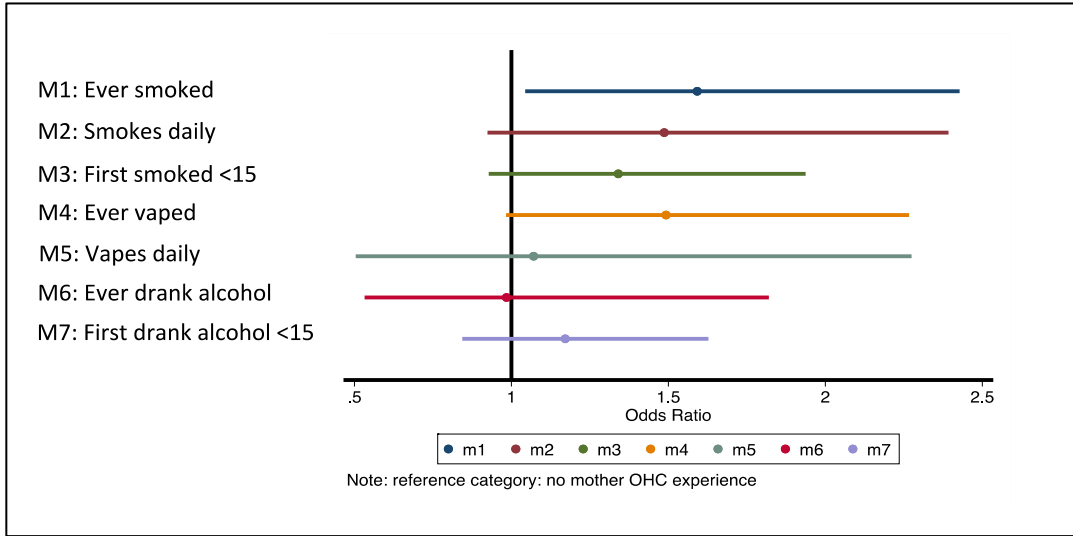
Table 4: teenage smoking, alcohol and drug taking by mother OHC experience

	Mother No OHC	Mother OHC
	Proportion	Proportion
Ever smoked	0.54	0.70
Currently smokes daily	0.09	0.17
Age first smoked: <15	0.23	0.34
Ever vaped	0.55	0.70
Currently vapes daily	0.04	0.05
Ever had alcohol	0.86	0.85
Age first had alcohol: <15	0.39	0.43
Ever taken drugs	0.42	0.55
Currently takes drugs	0.14	0.19
Ever taken cannabis	0.39	0.53
Ever taken cocaine	0.08	0.09
Ever taken ecstasy	0.11	0.10
Ever taken ketamine	0.05	0.03
<i>N(100%)</i>	18,505	305

Bold: differences significant: $p < .05$ [95% CIs do not overlap; OLS coefficient for mother OHC exp]

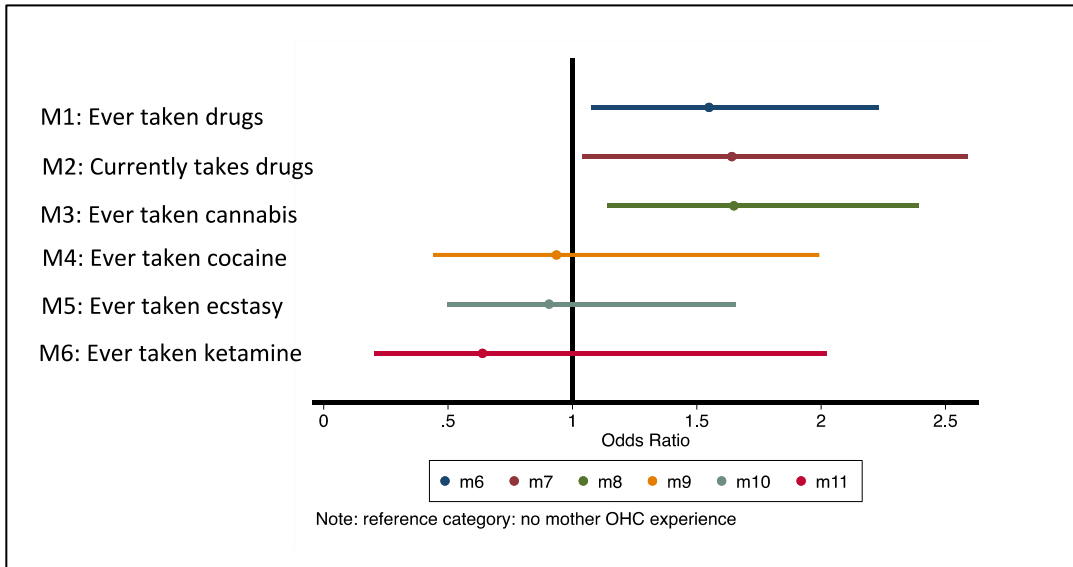
Figure 4a and 4b show the associations between teenage smoking, alcohol and drug taking and mother OHC experience after taking into account the teenager's individual and family background characteristics. Differences in these characteristics attenuated all significant associations with the exception of the teenager ever smoking and taking drugs, specifically cannabis. Generally, it was older white teenage boys who were more likely to smoke, drink alcohol and take drugs, together with those who had gained lower grade qualifications themselves who lived in rented housing with a mother with few qualifications. (See Appendix Table A4a and A4b for full regression results).

Figure 4a: teenage smoking and alcohol consumption: ORs for teenagers with a mother with OHC experience [adjusted for individual and family background characteristics]



Note: Models are adjusted for sex, ethnicity, age, GCSE attainment, working status of family, mother's highest qualification, housing tenure and area deprivation

Figure 4b: teenage drug taking: ORs for teenagers with a mother with OHC experience [adjusted for individual and family background characteristics]



Note: Models are adjusted for sex, ethnicity, age, GCSE attainment, working status of family, mother's highest qualification, housing tenure and area deprivation

Relationships and sexual activity

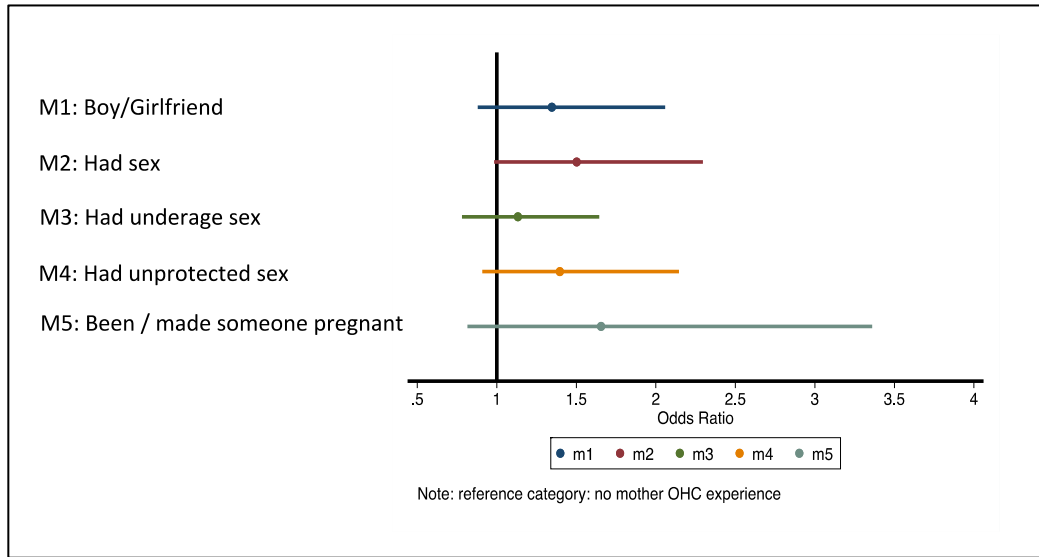
Table 5 shows the direct association between maternal OHC experience and indicators of the teenager's romantic and sexual activity without controls. The findings suggest that in comparison to their peers, teenagers with a mother with OHC experience were more likely to have had a boy- or girlfriend and to have had sex, including underage sex, but they were no more likely to have engaged in unprotected sex or to have either been or made someone pregnant. However, Figure 5 shows that all of these significant associations were attenuated when the teenager's individual and family background characteristics were adjusted for. The regression tables in the appendix suggest that it is older teenage girls who had had sex, and white teenagers with low-grade qualifications, including underage sex. They also were more likely to had experienced a pregnancy. Having a mother with low levels qualifications was also significantly associated with sex and underage sex, whereas rented housing was associated with all outcomes. (See Appendix Table A5 for full regression results).

Table 5: relationships and sexual activity by mother OHC experience

	Mother No OHC	Mother OHC
	Proportion	Proportion
Boy or girlfriend: yes	0.35	0.46
Had sex: yes	0.44	0.58
Age first had sex: <16	0.34	0.43
Had unprotected sex: yes	0.17	0.24
Experienced a pregnancy: yes	0.02	0.06
<i>N(100%)</i>	18,505	305

Bold: differences significant: $p < .05$ [95% CIs do not overlap; OLS coefficient for mother OHC exp]

Figure 5: Sexual risk taking and pregnancy: ORs for teenagers with a mother with OHC experience [adjusted for individual and family background characteristics]



Note: Models are adjusted for sex, ethnicity, age, GCSE attainment, working status of family, mother's highest qualification, housing tenure and area deprivation

Experience of crime and contact with the police

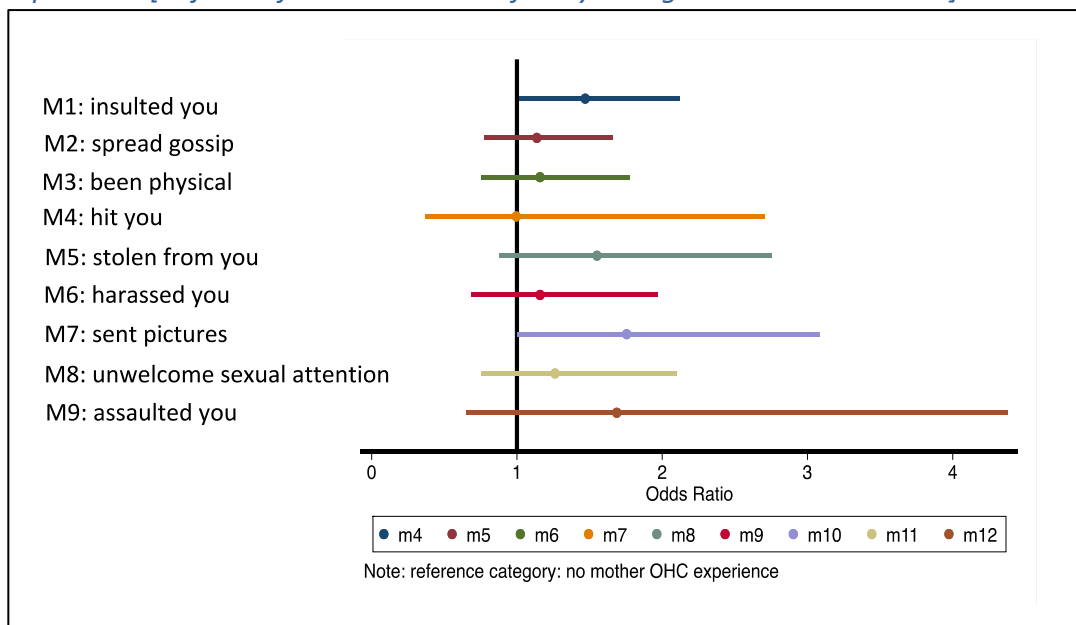
Table 6 shows the direct association between maternal OHC experience and indicators of the teenager's involvement in crime and contact with the police without controls. The findings suggest that compared to their peers, teenagers of mothers with OHC experience were no more likely to report being a victim of crime, however, they were more likely to have been verbally insulted in a public space. When the teenager's individual and family background characteristics were adjusted for (Figure 6a) the significant association remained suggesting that teenage children of mothers with OHC experience are more likely being insulted in a public space, particularly white teenage boys lived in rented housing.

Table 6: victim of misconduct or crime and police contact by mother OHC experience

	Mother No OHC	Mother OHC
	Proportion	Proportion
Victim of misconduct/crime: any	0.63	0.69
Victim of misconduct/crime: someone insulted you	0.41	0.52
Victim of misconduct/crime: spread gossip	0.40	0.42
Victim of misconduct/crime: been physically attacked	0.19	0.23
Victim of misconduct/crime: hit you	0.02	0.02
Victim of misconduct/crime: stolen from you	0.08	0.13
Victim of misconduct/crime: harrassed you	0.16	0.20
Victim of misconduct/crime: sent pictures	0.06	0.11
Victim of misconduct/crime: unwelcome sex attention	0.13	0.14
Victim of misconduct/crime: assaulted you	0.02	0.02
Police contact: stopped and questioned	0.26	0.34
Police contact: cautioned	0.09	0.23
Police contact: arrested	0.01	0.01
N(100%)	18,505	305

Bold: differences significant: $p < .05$ [95% CIs do not overlap; OLS coefficient for mother OHC exp]

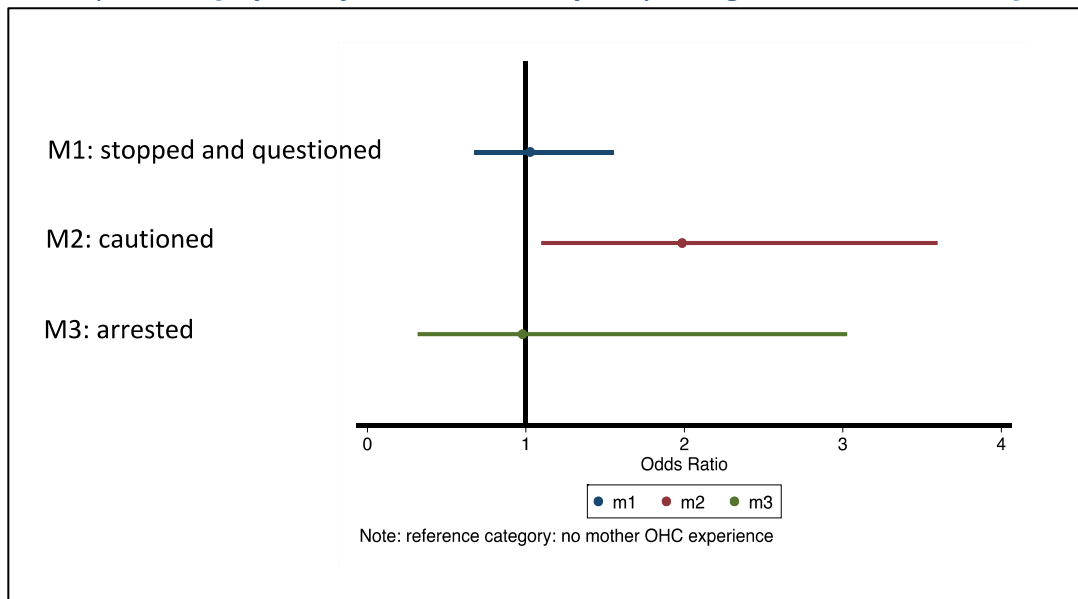
Figure 6a: Experience of misconduct or crime: ORs for teenagers with a mother with OHC experience [adjusted for individual and family background characteristics]



Note: Models are adjusted for sex, ethnicity, age, GCSE attainment, working status of family, mother's highest qualification, housing tenure and area deprivation

Turning to contact with the police, teenagers with a mother with OHC experience had a higher incidence of being stopped and questioned and were significantly more likely to have been formally cautioned. Just 1% of all teenagers had been arrested. Figure 6b shows that the significantly increased odds of being cautioned remained when their individual and family background characteristics were accounted for. In particular, being a teenage boy with fewer good grade examinations in a workless household significantly increased the odds of being cautioned. (See Appendix Table A6a and A6b for full regression results.)

Figure 6b: Experience of contact with the police: ORs for teenagers with a mother with OHC experience [adjusted for individual and family background characteristics]



Note: Models are adjusted for sex, ethnicity, age, GCSE attainment, working status of family, mother's highest qualification, housing tenure and area deprivation

Discussion

A central aim of any social care system is to provide effective support structures for the most vulnerable in our society, to reduce the intergenerational transmission of disadvantage and to hopefully improve a child's future development. Existing research has shown that for many children of care leavers, there is a long shadow of disadvantage associated with parental OHC during childhood that continues into the

second generation (Botchway et al., 2014; Parsons & Schoon, 2022; Parsons, Fitzsimons & Schoon, 2022). Using rich data from the nationally representative MCS, this broad profile of teenage outcomes adds to the [limited] available evidence, illustrating the continued disadvantage and trauma in the 2nd generation. The findings show that the teenaged children of mothers with OHC experience report and experience higher levels of depression, higher levels of hyperactivity problems, as well as self-harm and attempted suicide than their peers. In addition, they are more likely to smoke and use cannabis. They were also more likely to have been insulted and cautioned by the police. The findings draw an alarming picture of the continued experience of adversity and discrimination (see also Roberts, 2021), even in the 2nd generation. However, the children of care leavers also demonstrate resilience and optimism for their future, as they have similar education and occupational aspirations as their peers, and similar hopes and expectations about what they will achieve by age 30. Hopes and expectations for the future are an important motor that can drive even disadvantaged individuals to persist and succeed, as for example indicated in the finding that a considerable number of care leavers return to education at a later age than their peers (Brady & Gilligan, 2019; Harrison, 2019). The findings of this report also show that children of mothers with OHC experience are as likely as their peers to be in education or training by age 18, suggesting that the majority (86% versus 90%) are participating in either further or higher education.

A key concern from this current research, however, is that many teenagers of mothers with OHC experience have poorer mental health outcomes. Previous research has highlighted the poor mental health of care leavers (Tarren-Sweeney & Vetere, 2013; DfE, 2019a; Parsons & Schoon, 2022), and here we find stark evidence of intergenerational disadvantage as teenagers of mothers with OHC experience have increased odds of reporting hyperactivity behaviour problems, a higher number of depressive symptoms, to have been diagnosed and treated for depression by a doctor, to self-harm and to have attempted suicide. This constellation of negative mental

wellbeing outcomes clearly highlights the vital need to better support families with care-experience across the generations and for more research to understand what the key drivers of the negative associations are. The regression analyses show that it is girls and teenagers with fewer good grade exam passes in public examinations at age 16 who are most at risk of depression, self-harm and suicide, while it is teenage boys who have increased odds of hyperactivity behaviour problems, drug use and contact with the police.

Mental health provision notoriously falls short of demand (BMA, 2019). The current pandemic has seen the imbalance between demand and provision increase dramatically, with estimates placing 1.6 million people on waiting lists for mental health services (NHS Confederation, 2021; Newlove-Delgado, 2021). For example, in 2021 there had been an increase of 24% more children and adolescent patients being in contact with the Children and Young People's Mental Health Services (CYPMHS) compared with 2020, and 44% more than in 2019. This includes patients waiting to be seen, suggesting CYPMHS may be struggling to meet demand (Peytrignet et al., 2022).

Recent research by Parsons and Schoon (2022) based on the 1970 British Cohort Study at age 50 has shown that those with direct out-of-home care experience some 30-40+ years earlier, are at a greater risk of reporting poor general and mental health and higher levels of depression during the pandemic compared to those with no out-of-home care experience. Of particular concern is that the adult children of mothers who had OHC experience were also more than twice as likely to report poor mental health problems compared to those whose mothers had no public care experience, although poor mental health problems did not increase during the pandemic (Parsons & Schoon, 2022). The current findings of a more recent cohort of teenagers indicate a relatively high incidence of poor mental health among the teenage children of mothers with OHC experience, particularly regarding levels of self-harm and suicide attempts. It is troubling to find that 16% of children of OHC mothers had attempted suicide and 38% have self-

harmed. This clearly should be a call for action to adequately support this group of potentially vulnerable young people and their parents, particularly as increased levels of behaviour and socio-emotional problems were identified in the children of mothers with OHC experience at very early ages with gaps in emotional problems increasing as children enter the teenage years.

Other concerns are the greater incidence of smoking and cannabis use among teenage children of mothers with OHC experience and having been in contact with the police (in particular having been formally cautioned). Research has highlighted the over-representation of care leavers in the criminal justice system (Berman & Dar, 2013; Kennedy, 2013; McMahon & Fields, 2015; Crawford et al., 2018; Yoon et al., 2018) and in this study we find increased odds of cannabis use and police contact among teenage boys of mothers with OHC experience. In contrast to research based on care leavers themselves (Roberts et al., 2017; Svoboda, et al., 2012; Knight, et al., 2006), the reporting of a pregnancy was not higher among teenage girls.

In future research we will examine these outcomes *within* care-experienced families in more detail to identify potential protective factors or processes that can help to stop or minimise the risk of intergenerational transmission of disadvantage associated with care experience. First findings suggest that academic qualifications are one potential protective factor, as we found that a considerable number of young people did get 5+ good grade GCSEs in public examinations at age 16 (37% of children of care leavers in this study compared to 59% of their peers) or stayed on in education or training beyond age 16 (86% of children of care leavers in this study compared to 90% of their peers). Not gaining these qualifications was associated with many of the adverse outcomes across different domains such as employment, health and health behaviours, being in contact with the police. Not living in a rented housing or in a workless household in a deprived area is also protective, with rented housing associated with poor health, smoking, underage sex and teenage pregnancy, depression, suicide attempts and being

stopped and questioned by the police. Going forward we will also assess the association between parent and teenage health behaviours or wellbeing outcomes, where similar or identical measures are available in the data. Examples include smoking, drug use, physical and mental health.

Strengths and limitations

A key strength of this research lies in its use of the Millennium Cohort Study, a large population-based and representative prospective longitudinal study with a design that ensured adequate representation of disadvantaged groups and families from minority ethnic backgrounds. The study included a retrospective question on parents' experience of out-of-home care during their own childhood, which has provided a rare opportunity to examine the intergenerational transmission of disadvantage among a sample of care-experienced women who became mothers. As such, we are able to draw attention to the experiences of the teenage children of care leavers across different domains of life and highlight where differences do – and do not – exist in comparison to their peers, and to highlight where the lives of teenaged children of mothers with OHC experience are more challenging.

However, we must also acknowledge that we do not know how many people with care-experience did not agree to take part in the study and therefore our sample of care-leaver mothers may already be relatively well adjusted and functional compared to all those with care experience. If anything, our findings might thus show a more positive picture of the challenges faced by the children of care leavers who became mothers. However, gaining a better insight into the experiences of this highly vulnerable group of children and their mothers will provide new evidence to inform the design of effective support structures and initiatives. Given the data are derived from an observational longitudinal study, bias due to unmeasured confounding cannot be ruled out. As in any longitudinal survey, missing data due to attrition are unavoidable, although this is minimised in this research by only using information from the first two waves of data collection. Nonetheless, we employed multiple imputation and included the most

important predictors of missing data in our models to maximise the plausibility of the missing at random assumption and restore sample representativeness. However, bias due to a non-ignorable missing data generating mechanism cannot be ruled out.

Conclusion

This report has identified different aspects of intergenerational transmission of disadvantage and trauma that occurs in families where the mother has OHC experience. Our previous research has highlighted mothers with OHC experience report poorer general and mental health than other mothers (Parsons & Schoon, 2021), and here we find increased odds that their teenaged children to also self-report behaviour and mental health problems, including self-harm and attempted suicide, together with increased rates of smoking tobacco, cannabis use and police contact. The findings illustrate the need for parents with OHC experience and their children to have on-going access to support structures aiming to limit the cast of the long shadow of care experience among these most vulnerable families.

References

Berman, G. & Dar, A. (2013). Prison Population Statistics, SN/SG/4334, London: House of Commons Library.

Botchway, S., Quigley, M. & Gray, R. (2014). Pregnancy-associated outcomes in women who spent some of their childhood looked after by local authorities: findings from the UK Millennium Cohort Study. *BMJ Open*, 4(12), e005468.

<http://dx.doi.org/10.1136/bmjopen-2014-005468>

British Medical Association [BMA]. (2019). Measuring progress: Commitments to support and expand the mental health workforce in England.

<https://www.bma.org.uk/media/2405/bma-measuring-progress-of-commitments-for-mental-health-workforce-jan-2020.pdf>

Centre for Social Justice (2015). Finding their Feet: Equipping care leavers to reach their potential. [https://www.centreforsocialjustice.org.uk/library/finding-their-feet-](https://www.centreforsocialjustice.org.uk/library/finding-their-feet-equipping-care-leavers-to-reach-their-potential)

[equipping-care-leavers-to-reach-their-potential](https://www.centreforsocialjustice.org.uk/library/finding-their-feet-equipping-care-leavers-to-reach-their-potential)

Connelly, R. & Platt, L. (2014). Cohort Profile: UK Millennium Cohort Study (MCS).

International Journal of Epidemiology, 43(6), pp.1719-1725.

<https://doi.org/10.1093/ije/dyu001>

Cooper, Z. & Williams, A.R. (2019). Cannabis and Cannabinoid Intoxication and Toxicity in *Cannabis Use Disorder* (p 103-111). Eds. Montoya I and Weiss S. Springer Publishing Inc.

Crawford, B., Pharris, A. B., & Dorsett-Burrell, R. (2018). Risk of serious criminal involvement among former foster youth aging out of care. *Children and Youth Services Review*, 93, pp.451-457. <https://doi.org/10.1016/j.childyouth.2018.08.027>

DfE. (2016). Putting Children First: delivering our vision for excellent children's social care. [https://www.gov.uk/government/publications/putting-children-first-our-vision-](https://www.gov.uk/government/publications/putting-children-first-our-vision-for-childrens-social-care)

[for-childrens-social-care](https://www.gov.uk/government/publications/putting-children-first-our-vision-for-childrens-social-care)

DfE. (2019a). Children looked after in England (including adoption), year ending 31 March 2019.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachm](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/850306/Children_looked_after_in_England_2019_Text.pdf)
[ent_data/file/850306/Children looked after in England 2019 Text.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/850306/Children_looked_after_in_England_2019_Text.pdf)

DfE. (2019b). Participation Rates in Higher Education: Academic Years 2006/2007 – 2017/2018 (Provisional).

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachm](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/843542/Publication_HEIPR1718.pdf)
[ent_data/file/843542/Publication HEIPR1718.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/843542/Publication_HEIPR1718.pdf)

- DfE. (2019c). NEET statistics annual brief: 2018, England.
<https://www.gov.uk/government/statistics/neet-statistics-annual-brief-2018>
- DfE. (2021). Evaluation of the Mental Health Assessment Pilots for looked after children.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1035621/Evaluation_of_the_Mental_Health_Assessment_Pilots_for_looked_after_children.pdf
- DfE. (2022a) Children looked after in England including adoptions. Available at: <https://explore-education-statistics.service.gov.uk/find-statistics/children-looked-after-in-england-including-adoptions/2021>
- DfE. (2022b) Widening participation in higher education. Available at: <https://explore-education-statistics.service.gov.uk/find-statistics/widening-participation-in-higher-education>
- Dregan, A. & Gulliford, M. (2012). Foster care, residential care and public care placement patterns are associated with adult life trajectories: population-based cohort study. *Social Psychiatry*, 47(9), pp.1517-26. <https://doi.org/10.1007/s00127-011-0458-5>
- Foster, L. J. J., Beadnell, B., & Pecora, P. J. (2015). Intergenerational pathways leading to foster care placement of foster care alumni's children. *Child & Family Social Work*, 20(1), 72-82. doi:[10.1111/cfs.12057](https://doi.org/10.1111/cfs.12057)
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A Research Note. *Journal of Child Psychology and Psychiatry*, 38(5), 581-586.
<https://doi.org/10.1111/j.1469-7610.1997.tb01545.x>
- Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire (SDQ). *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 1337- 1345. <https://doi.org/10.1097/00004583-200111000-00015>
- Hallett, S. (2016). An Uncomfortable Comfortableness: Care, Child Protection and Child Sexual Exploitation. *British Journal of Social Work*, 46(7), pp. 2137–2152.
<https://doi.org/10.1093/bjsw/bcv136>
- HM Government. (2013). Care Leaver Strategy - A cross-departmental strategy for young people leaving care.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/266484/Care_Leaver_Strategy.pdf
- HM Government. (2016). Keep on Caring – Supporting Young People from Care to Independence.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/535899/Care-Leaver-Strategy.pdf

House of Commons Education Committee. (2022). Educational poverty: how children in residential care have been let down and what to do about it. Second Report of Session 2022–23.

<https://committees.parliament.uk/publications/23006/documents/168514/default/>

Joshi, H. & Fitzsimons, E. (2016). The Millennium Cohort Study: the making of a multi-purpose resource for social science and policy. *Longitudinal and Life Course Studies*, 7(4), pp.409-430. <http://dx.doi.org/10.14301/llcs.v7i4.410>

Jorgensen, C. & Wells, J. (2022). Is marijuana really a gateway drug? A nationally representative test of the marijuana gateway hypothesis using a propensity score matching design. *Journal of Experimental Criminology*, 18, 497–514.

<https://doi.org/10.1007/s11292-021-09464-z>

Kennedy E (2013). *Children and Young People in Custody 2012-13: An analysis of 15-18 year olds' perceptions of their experiences in Young Offender Institutions*, London:

HMIP/YJB. <https://www.justiceinspectores.gov.uk/prisons/wp-content/uploads/sites/4/2014/03/hmip-children-young-people-in-custody-12-13.pdf>

Kessler, R.C., Barker, P.R., Colpe, L.J., Epstein, J.F., Gfroerer, J.C., Hiripi, E., Howes, M.J., Normand, S-L.T., Manderscheid, R.W., Walters, E.E., Zaslavsky, A.M. (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry*. 60(2), 184-189. [Information on scoring and interpretation of this scale can be found at http://www.hcp.med.harvard.edu/ncs/k6_scales.php.]

Knight, A., Chase, E. & Aggleton, P. (2006). Teenage pregnancy among young people in and leaving care: Messages and implications for foster care. *Adoption & Fostering*, 30 (1), pp.58-69. <https://doi.org/10.1177%2F030857590603000108>

Little, R. & Rubin, D. (2014). *Statistical Analysis with Missing Data*. 2nd Edition, John Wiley & Sons, Hoboken.

Maxwell, A., Proctor, J. & Hammond, L. (2011). Me and my child: parenting experiences of young mothers leaving care. *Adoption & Fostering*, 35(4), pp.29-40.

<https://doi.org/10.1177%2F030857591103500404>

McMahon, R. C. & Fields, S. A. (2015). Criminal conduct subgroups of "aging out" foster youth. *Children and Youth Services Review*, 48, pp.14-19.

doi:10.1016/j.chilyouth.2014.11.010

Mostafa, T. & Wiggins, R. (2015). The impact of attrition and non-response in birth cohort studies: a need to incorporate missingness strategies. *Longitudinal and Life Course Studies*, 6(2), pp.131-146. <http://dx.doi.org/10.14301/llcs.v6i2.312>

Mostafa, T., Narayanan, M., Pongiglione, B., Dodgeon, B., Goodman, A., Silverwood, R. et al. (2020). Improving the plausibility of the missing at random assumption in the 1958 British birth cohort: A pragmatic data driven approach. London: UCL Centre for Longitudinal Studies. <https://cls.ucl.ac.uk/wp-content/uploads/2017/02/CLS-working-paper-2020-6-Improving-the-plausibility-of-the-missing-at-random-assumption-in-the-1958-British-birth-cohort-1.pdf>

Newlove-Delgado, T., Williams, T., Robertson, K., McManus, S., Sadler, K., Vizard, T., Cartwright, C., Mathews, F., Norman, S., Marcheselli, F. & Ford, T. (2021). Mental Health of Children and Young People in England, 2021. NHS Digital, Leeds. https://files.digital.nhs.uk/97/B09EF8/mhcyp_2021_rep.pdf

NHS Confederation. (2021). Autumn Budget and Spending Review 2021. <https://www.nhsconfed.org/sites/default/files/2021-11/Parliamentary-briefing-Autumn-Budget-Spending-Review-2021.pdf>

Parsons, S., & Schoon, I. (2022). Does the trauma associated with out-of-home care transmit across generations? Evidence from the 1970 British Cohort Study during a major health pandemic. *BMJ Open*, 12(4). <http://dx.doi.org/10.1136/bmjopen-2021-056736>

Parsons, S. Fitzsimons, E. & Schoon, I. (2022) Intergenerational transmission of educational disadvantage: Educational progression of children of care leavers compared to other children in a general population sample. CLS Working Paper 2022/7. London: UCL Centre for Longitudinal Studies. <https://cls.ucl.ac.uk/wp-content/uploads/2022/09/CLS-Working-papers-2022-7-Intergenerational-transmission-of-educational-disadvantage.pdf>

Peytrignet, S., Marszalek, K., Grimm, F., Thorlby, R., & Wagstaff, T. (2022). Children and young people's mental health. COVID-19 and the road ahead. <https://www.health.org.uk/news-and-comment/charts-and-infographics/children-and-young-people-s-mental-health>.

Plewis, I. (Ed.) (2007). Millennium Cohort Study first survey: Technical report on sampling (4th edn) (London, Centre for Longitudinal Studies). <https://cls.ucl.ac.uk/wp-content/uploads/2017/07/Technical-Report-on-Sampling-4th-Edition-August-2007.pdf>

Pryce, J. M. & Samuels, G. M. (2010). Renewal and risk: The dual experience of young motherhood and aging out of the child welfare system. *Journal of Adolescent Research*, 25(2), pp.205-230. <https://doi.org/10.1177%2F0743558409350500>

Roberts, L., Meakings, S., Forrester, D., Smith, A. & Shelton, K. (2017). Care-leavers and their children placed for adoption. *Children and Youth Services Review*, 79C, pp. 355-361. <https://dx.doi.org/10.1016/j.childyouth.2017.06.030>

Roberts, L., Maxwell, N. & Elliott, M. (2019). When young people in and leaving state care become parents: What happens and why? *Children and Youth Services Review* 104, pp. 104387. <http://dx.doi.org/10.1016/j.childyouth.2019.104387>

Roberts, L. (2021). *The children of looked after children: outcomes, experiences and ensuring meaningful support to young parents in and leaving care*. Bristol: Policy Press.

Silverwood, R., Narayanan, M., Dodgeon, B. & Ploubidis, G.B. (2020) Handling missing data in the National Child Development Study: User guide, London: UCL Centre for Longitudinal Studies. <https://cls.ucl.ac.uk/wp-content/uploads/2020/04/Handling-missing-data-in-the-National-Child-Development-Study-User-Guide.pdf>

Sacker, A., Lacey, R. E., Maughan, B., & Murray, E. T. (2022). Out-of-home care in childhood and socio-economic functioning in adulthood: ONS Longitudinal study 1971-2011. *Children and Youth Services Review*, 132. <https://doi.org/10.1016/j.childyouth.2021.106300>

Shover, C., Davis, C., Gordon, S. & Humphreys, K. (2019). Association Between Medical Cannabis Laws and Opioid Overdose Mortality has Reversed Over Time, *Proceedings of National Academy of Science USA* 116 (26), 12624–12626, <https://doi.org/10.1073/pnas.1903434116>

Svoboda, D. V., Shaw, T.V., Barth, R.P., et al. (2012). Pregnancy and parenting among youth in foster care: a review. *Children and Youth Services Review*, 34(5), pp.867-875. <https://doi.org/10.1016/j.childyouth.2012.01.023>

Tarren-Sweeney, M. & Vetere, A. (Eds) (2013). *Mental health services for vulnerable children and young people: Supporting children who are, or have been, in foster care*. London: Routledge.

Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., Parkinson, J., Secker, J. & Stewart-Brown, S. (2007). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): Development and UK validation. *Health and Quality of Life Outcomes*, 5, Article 63. <https://doi.org/10.1186/1477-7525-5-63>

University of London, Institute of Education, Centre for Longitudinal Studies. (2021). Millennium Cohort Study: Seventh Survey, 2018. [data collection]. 2nd Edition. UK Data Service. SN: 8682, DOI: [10.5255/UKDA-SN-8682-2](https://doi.org/10.5255/UKDA-SN-8682-2)

University of London, Institute of Education, Centre for Longitudinal Studies. (2022a). Millennium Cohort Study: First Survey, 2001-2003. [data collection]. 14th Edition. UK Data Service. SN: 4683, DOI: [10.5255/UKDA-SN-4683-6](https://doi.org/10.5255/UKDA-SN-4683-6)

University of London, Institute of Education, Centre for Longitudinal Studies. (2022b). Millennium Cohort Study: Second Survey, 2003-2005. [data collection]. 11th Edition. UK Data Service. SN: 5350, DOI: [10.5255/UKDA-SN-5350-6](https://doi.org/10.5255/UKDA-SN-5350-6)

Volkow, N.D., Swanson, J.M., Evins, A.E., et al. (2016). Effects of Cannabis use on Human Behavior, Including Cognition, Motivation, and Psychosis: A Review, *JAMA Psychiatry* 73 (3), 292–297. DOI: [10.1001/jamapsychiatry.2015.3278](https://doi.org/10.1001/jamapsychiatry.2015.3278)

White, I.R., Royston, P. & Wood, A.M. (2011) Multiple imputation using chained equations: Issues and guidance for practice, *Statistics in Medicine*, 30(4), 377–399. DOI: [10.1002/sim.4067](https://doi.org/10.1002/sim.4067)

Williams, A.R. (2020). Cannabis as a Gateway Drug for Opioid Use Disorder. *Journal of Law Medicine & Ethics*, 48(2), 268-274. <https://doi.org/10.1177/1073110520935338>

Yoon, M., Bender, A. E., & Park, J. (2018). The association between out-of-home placement and offending behavior among maltreated youth: A systematic review. *Children and Youth Services Review*, 95, pp.263-281. <https://doi.org/10.1016/j.childyouth.2018.11.006>

Youth In Mind (2016). Scoring the SDQ. <https://www.sdqinfo.org/py/sdqinfo/c0.py>

Appendix

Table A1: proportion of missing data in each variable included in the analyses and average level of missingness in dataset

Variable	N	N(missing)	%(missing)
Mother OHC	18,810	0	0.00
English +/-or other language spoken	18,810	0	0.00
Mother Ethnicity	18,810	0	0.00
Formal childcare S1	18,810	0	0.00
Non-parent childcare S1	18,810	0	0.00
Any childcare S1	18,810	0	0.00
Teenager ethnicity	18,810	0	0.00
Index Multiple Deprivation	18,810	0	0.00
Type of OHC	18,810	0	0.00
Time in OHC	18,810	0	0.00
Sex of teenager	18,810	0	0.00
Mother age at teenager birth	18,806	4	0.00
Mother highest qualification	18,780	30	0.00
Mother has problems reading	18,779	31	0.00
Mother has problems counting money	18,778	32	0.00
Last occupation	18,778	32	0.00
Mother has problems filling in a form	18,777	33	0.00
Single parent S1	18,189	621	0.03
Older siblings S1	18,189	621	0.03
Workless household S1	18,189	621	0.03
Mother smokes cigarettes	18,189	621	0.03
Mother occupation class	18,189	621	0.03
Ever been homeless S1	18,186	624	0.03
Mother general health S1	18,182	628	0.03
Mother longstanding illness S1	18,180	630	0.03
Breastfeeding S1	18,167	643	0.03
Attended antenatal classes S1	18,161	649	0.03
Overcrowded home S1	18,160	650	0.03
Has access to a car S1	18,159	651	0.03
Has access to a computer S1	18,159	651	0.03
Birthweight S1	18,157	653	0.03
Access to the internet S1	18,150	660	0.04
Dislike home S1	18,149	661	0.04
Housing tenure S1	18,149	661	0.04
Dislike area where live S1	18,148	662	0.04

Variable	N	N(missing)	%(missing)
Dampness in the home S1	18,145	665	0.04
Pregnancy was planned S1	18,141	669	0.04
Poverty S1	18,132	678	0.04
Happy when told pregnant S1	18,109	701	0.04
Gestation (weeks) S1	17,983	827	0.04
Place to play safely S1	17,917	893	0.05
Child crying a problem S1	17,913	897	0.05
Low satisfaction with life S1	17,561	1,249	0.07
Maternal attachment scale S1	17,551	1,259	0.07
Malaise score (depression) S1	17,493	1,317	0.07
Attended antenatal classes S2	17,481	1,329	0.07
Parenting belief scale S1	17,056	1,754	0.09
Have support from friends/family S1	16,591	2,219	0.12
Feel safe in area where live S1	16,040	2,770	0.15
Self-esteem scale S1	15,276	3,534	0.19
Single parent S2	15,174	3,636	0.19
Teenager has siblings S2	15,174	3,636	0.19
Formal childcare S2	15,174	3,636	0.19
Non-parent childcare S2	15,174	3,636	0.19
Any childcare S2	15,174	3,636	0.19
Child had regular bedtime S2	15,173	3,637	0.19
Child had regular mealtime S2	15,173	3,637	0.19
Dampness in the home S2	15,173	3,637	0.19
Has access to a car S2	15,173	3,637	0.19
Dislike home S2	15,173	3,637	0.19
Dislike area where live S2	15,173	3,637	0.19
Feel safe in area live S2	15,173	3,637	0.19
General health S2	15,173	3,637	0.19
Depression and anxiety Sa	15,173	3,637	0.19
Longstanding illness S2	15,173	3,637	0.19
Housing tenure S2	15,173	3,637	0.19
How often drink alcohol S2	15,173	3,637	0.19
Family has a lot of rules S2	15,172	3,638	0.19
Family enforces rules S2	15,172	3,638	0.19
Disorganised home S2	15,172	3,638	0.19
Can't hear self think at home S2	15,172	3,638	0.19
Not a calm environment at home S2	15,172	3,638	0.19
Home learning environment scale S2	15,172	3,638	0.19
Makes regular savings S2	15,171	3,639	0.19

Variable	N	N(missing)	%(missing)
Able to manage finances Sa	15,171	3,639	0.19
Poverty S2	15,155	3,655	0.19
Mother sees own mother s2	15,146	3,664	0.19
Workless household S2	15,144	3,666	0.19
Live in Safe area for children S2	15,125	3,685	0.20
Mother sees own father S2	14,914	3,896	0.21
Single parent S3	14,907	3,903	0.21
Workless household S3	14,906	3,904	0.21
Employment status S3	14,826	3,984	0.21
Housing tenure S3	14,822	3,988	0.21
Poverty S3	14,811	3,999	0.21
Child age S3	14,718	4,092	0.22
BAS Picture similarities S3	14,652	4,158	0.22
BAS naming vocabulary S3	14,630	4,180	0.22
Mother has financial help from parents S2	14,581	4,229	0.22
BAS pattern construction S3	14,579	4,231	0.22
Access to the internet S2	14,550	4,260	0.23
Same parent(s) in household S2	14,550	4,260	0.23
SDQ conduct problems S2	14,526	4,284	0.23
SDQ emotional problems S2	14,501	4,309	0.23
SDQ conduct problems S3	14,442	4,368	0.23
SDQ emotional problems S3	14,423	4,387	0.23
SDQ peer problems S3	14,416	4,394	0.23
SDQ peer problems S2	14,404	4,406	0.23
SDQ hyperactivity problems S2	14,392	4,418	0.23
SDQ hyperactivity problems S3	14,361	4,449	0.24
BAS Naming Vocabulary S2	14,230	4,580	0.24
Partner used force S1	14,167	4,643	0.25
Single parent S4	13,546	5,264	0.28
Workless household S4	13,546	5,264	0.28
Poverty S4	13,531	5,279	0.28
Mother used recreational drugs S2	13,414	5,396	0.29
Housing tenure S4	13,413	5,397	0.29
Kessler score S2	13,386	5,424	0.29
Low satisfaction with life S2	13,310	5,500	0.29
Parent competence scale S2	13,273	5,537	0.29
Maths score S4	13,271	5,539	0.29
BAS Pattern Construction S4	13,218	5,592	0.30
SDQ conduct problems S4	13,189	5,621	0.30

Variable	N	N(missing)	%(missing)
SDQ peer problems S4	13,168	5,642	0.30
SDQ emotional problems S4	13,161	5,649	0.30
SDQ hyperactivity problems S4	13,142	5,668	0.30
BAS Word Reading S4	13,108	5,702	0.30
Poverty S5	13,004	5,806	0.31
Single parent S5	13,004	5,806	0.31
Workless household S5	13,004	5,806	0.31
Pianta conflict score S2	12,995	5,815	0.31
Housing tenure S5	12,777	6,033	0.32
Pianta closeness score S2	12,737	6,073	0.32
Occupation aspirations S5	12,721	6,089	0.32
BAS Verbal Similarities S5	12,718	6,092	0.32
SDQ peer problems S5	12,542	6,268	0.33
SDQ conduct problems S5	12,538	6,272	0.33
SDQ emotional problems S5	12,535	6,275	0.33
SDQ hyperactivity problems S5	12,516	6,294	0.33
Poverty S6	11,459	7,351	0.39
SDQ peer problems S6	11,087	7,723	0.41
SDQ conduct problems S6	11,084	7,726	0.41
SDQ emotional problems S6	11,083	7,727	0.41
SDQ hyperactivity problems S6	11,077	7,733	0.41
Been treated from depression S7	10,007	8,803	0.47
Dr told teenager has depression S7	10,007	8,803	0.47
In education, employment or training [EET] S7	10,007	8,803	0.47
In education or training S7	10,007	8,803	0.47
Kessler scale S7	9,761	9,049	0.48
Had a boy/girlfriend S7	9,748	9,062	0.48
Somebody has hit teenager S7	9,746	9,064	0.48
Somebody has been physical with teenager S7	9,745	9,065	0.48
Somebody has harassed teenager S7	9,745	9,065	0.48
Somebody has insulted teenager S7	9,742	9,068	0.48
Somebody has assaulted teenager S7	9,742	9,068	0.48
Somebody has spread gossip about teenager S7	9,741	9,069	0.48
Ever tried ketamine S7	9,740	9,070	0.48
Somebody has stolen from teenager S7	9,740	9,070	0.48
Teenager had unwelcome sexual attention S7	9,740	9,070	0.48
Ever tried cannabis S7	9,738	9,072	0.48
Somebody has send pictures to teenager S7	9,735	9,075	0.48
Ever tried cocaine S7	9,734	9,076	0.48

Variable	N	N(missing)	%(missing)
Ever tried ecstasy S7	9,729	9,081	0.48
Ever smoked S7	9,719	9,091	0.48
Ever vaped S7	9,717	9,093	0.48
Warwick Edinburgh Mental Wellbeing score S7	9,707	9,103	0.48
Had sex S7	9,689	9,121	0.48
Age first smoked tobacco S7	9,680	9,130	0.49
Ever been pregnant S7	9,678	9,132	0.49
Had unprotected sex S7	9,676	9,134	0.49
Gained 5+ grade 4-9 GCSEs S7	9,654	9,156	0.49
Longstanding illness S7	9,649	9,161	0.49
General health S7	9,648	9,162	0.49
Age first had sex S7	9,627	9,183	0.49
Age first drank alcohol S7	9,620	9,190	0.49
SDQ emotional problems S7	9,525	9,285	0.49
SDQ conduct problems S7	9,525	9,285	0.49
SDQ hyperactivity problems S7	9,524	9,286	0.49
SDQ peer problems S7	9,524	9,286	0.49
Attempted suicide S7	9,505	9,305	0.49
Self-harmed S7	9,495	9,315	0.50
SDQ pro-social S7	6,647	12,163	0.65
Stopped & questioned by Police S7	6,575	12,235	0.65
Cautioned by Police S7	6,568	12,242	0.65
Arrested by Police S7	6,568	12,242	0.65
Likelihood of going to university S7	6,480	12,330	0.66
Occupation aspirations S7	4,129	14,681	0.78
		Average missing	0.25

Appendix Table A2a: OLS Regression results: % likelihood of going to university
 [unstandardised coefficients]

	Unadjusted	Adjusted
Mother OHC	-9.08* (3.95)	2.08 (3.79)
Teenage Characteristics		
Female		6.09*** (0.61)
Ethnic minority		9.46*** (1.28)
Age		-1.36 (1.11)
5+ grade 4-9 GCSEs		22.69*** (0.84)
Family SES		
Workless household		-0.69 (1.22)
Mother NVQ2+ quals		7.43*** (0.82)
English +/- or other language spoken		11.46*** (1.47)
Rented home		-6.07*** (0.86)
Live in deprived area		-1.69* (0.82)
_cons	54.48*** (0.78)	56.12** (19.37)
<i>N</i>	18810	18810

Standard errors in parentheses
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.00$

Appendix Table A2b: Logistic Regression results: GCSE attainment, in Education, Training or Employment, occupation aspirations by mother OHC experience [Odds Ratios]

	5+ Grade 4-9 GCSEs	In EET	In Edu or Training	Don't know Occupation	Prof/Man Occupation
Mother OHC	0.80 (0.16)	1.18 (0.37)	1.13 (0.29)	0.80 (0.32)	0.91 (0.23)
Teenage Characteristics					
Female	1.34*** (0.06)	0.83* (0.07)	0.91 (0.06)	0.94 (0.07)	1.13* (0.06)
Ethnic minority	1.33** (0.12)	1.23 (0.22)	1.39* (0.21)	1.46* (0.23)	1.20 (0.12)
Age	1.06 (0.08)	0.49*** (0.07)	0.47*** (0.06)	0.84 (0.11)	0.91 (0.08)
5+ grade 4-9 GCSEs		2.21*** (0.27)	2.14*** (0.22)	1.50*** (0.14)	1.76*** (0.11)
Family SES					
Workless household	0.65*** (0.05)	0.79* (0.09)	0.81 (0.09)	0.97 (0.11)	1.00 (0.09)
Mother NVQ2+ quals	1.94*** (0.12)	1.08 (0.11)	1.13 (0.11)	1.12 (0.13)	1.19** (0.08)
English +/- or other language spoken	1.51*** (0.15)	1.33 (0.26)	1.37 (0.24)	1.23 (0.20)	1.32* (0.14)
Rented home	0.51*** (0.03)	0.64*** (0.07)	0.59*** (0.05)	0.79* (0.07)	0.85* (0.06)
Live in deprived area	0.78*** (0.05)	0.95 (0.09)	0.94 (0.08)	0.88 (0.08)	0.92 (0.06)
<i>N</i>	18810	18810	18810	18810	18810

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table A2c: Logistic Regression results: What teenagers expect to have achieved by age 30 by mother OHC experience [Odds Ratios]

	Own Home	Good Car	Earn £££	Worthwhile Job	Children	Married/Partner	Famous	Achieved [sport/art]
Mother OHC	0.69 (0.15)	0.64 (0.14)	0.74 (0.22)	1.15 (0.36)	0.99 (0.21)	1.19 (0.33)	0.77 (0.24)	1.24 (0.36)
Teenage Characteristics								
Female	1.07 (0.05)	1.14** (0.05)	0.91* (0.04)	1.14* (0.06)	1.37*** (0.06)	1.20*** (0.06)	0.82** (0.06)	0.90 (0.05)
Ethnic minority	0.99 (0.11)	1.08 (0.11)	1.37** (0.13)	0.85 (0.09)	1.11 (0.11)	0.99 (0.10)	1.46* (0.22)	1.00 (0.12)
Age	1.00 (0.09)	0.95 (0.07)	1.06 (0.09)	0.94 (0.08)	1.09 (0.08)	0.96 (0.08)	0.90 (0.10)	1.01 (0.09)
5+ grade 4-9 GCSEs	1.04 (0.06)	1.10 (0.06)	0.91 (0.05)	1.75*** (0.10)	1.02 (0.06)	1.42*** (0.10)	0.91 (0.07)	1.10 (0.07)
Family SES								
Workless household	1.02 (0.09)	0.93 (0.10)	0.98 (0.09)	0.89 (0.08)	1.09 (0.09)	0.93 (0.10)	0.94 (0.10)	0.89 (0.10)
Mother NVQ2+ quals	0.95 (0.06)	0.92 (0.06)	0.89 (0.06)	1.16* (0.07)	0.84** (0.05)	1.07 (0.08)	1.02 (0.09)	1.07 (0.07)
English +/- or other lang spoken	1.07 (0.12)	1.10 (0.11)	1.37** (0.13)	1.08 (0.13)	1.20 (0.12)	1.24 (0.14)	0.91 (0.14)	1.01 (0.15)
Rented home	0.81** (0.06)	0.97 (0.07)	1.03 (0.06)	0.89 (0.07)	1.08 (0.08)	0.82** (0.06)	1.14 (0.11)	1.03 (0.08)
Live in deprived area	1.02 (0.07)	0.97 (0.07)	1.02 (0.07)	0.84** (0.05)	1.08 (0.05)	1.00 (0.07)	1.07 (0.09)	1.02 (0.06)
N	18810	18810	18810	18810	18810	18810	18810	18810

Exponentiated coefficients; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table A3a: OLS Regression results: mental health and wellbeing [unstandardised coefficients]

	Kessler scale	Warwick Edinburgh Mental Wellbeing scale
Mother OHC	1.60** (0.52)	-0.60 (0.40)
Teenage Characteristics		
Female	1.28*** (0.10)	-0.80*** (0.09)
Ethnic minority	-0.44* (0.18)	0.28 (0.17)
Age	0.01 (0.16)	0.20 (0.13)
5+ grade 4-9 GCSEs	0.01 (0.11)	0.37*** (0.09)
Family SES		
Workless household	0.16 (0.19)	-0.19 (0.18)
Mother NVQ2+ quals	0.12 (0.14)	-0.03 (0.12)
English +/- other lang spoken	-0.42* (0.20)	0.23 (0.19)
Rented home	0.57*** (0.13)	-0.41*** (0.11)
Live in deprived area	-0.04 (0.12)	0.05 (0.11)
_cons	6.40* (2.73)	19.24*** (2.15)
<i>N</i>	18810	18810

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table A3b: Logistic Regression results: health, behaviour problems, self-harm and suicide [Odds Ratios]

	Poor/Fair Health	Longstanding Illness	SDQ Emotional	SDQ Conduct	SDQ Hyper	SDQ Peer	13+ Kessler	Told Depressed	Treated Depression	Self- harmed	Suicide attempt
Mother OHC	1.13 (0.32)	1.46 (0.32)	1.28 (0.30)	1.66 (0.51)	1.86** (0.37)	1.31 (0.40)	1.80** (0.39)	1.94** (0.41)	2.42** (0.68)	1.57* (0.28)	1.85* (0.49)
Teenage Characteristics											
Female	1.21* (0.10)	1.13* (0.06)	2.20*** (0.16)	0.79* (0.08)	0.88 (0.06)	1.30* (0.14)	1.72*** (0.10)	1.74*** (0.12)	3.19*** (0.39)	1.41*** (0.08)	1.72*** (0.15)
Ethnic minority	1.14 (0.16)	0.82 (0.10)	0.65** (0.10)	1.07 (0.17)	0.69** (0.09)	0.91 (0.19)	0.84 (0.10)	0.62** (0.09)	0.47** (0.13)	0.74** (0.08)	0.79 (0.12)
Age	0.91 (0.11)	0.92 (0.08)	0.98 (0.09)	0.97 (0.14)	0.93 (0.08)	0.99 (0.16)	0.98 (0.08)	1.11 (0.11)	0.90 (0.14)	0.94 (0.08)	1.03 (0.13)
5+ grade 4-9 GCSEs	0.55*** (0.05)	0.66*** (0.04)	1.06 (0.07)	0.59*** (0.06)	0.68*** (0.05)	0.65*** (0.08)	0.93 (0.06)	0.75*** (0.06)	0.81 (0.10)	0.91 (0.05)	0.68*** (0.06)
Family SES											
Workless household	1.03 (0.12)	1.12 (0.10)	0.97 (0.12)	1.07 (0.14)	0.94 (0.09)	1.05 (0.15)	1.07 (0.11)	0.95 (0.09)	0.69 (0.14)	1.05 (0.09)	1.31* (0.16)
Mother NVQ2+ quals	0.95 (0.10)	1.10 (0.08)	0.95 (0.08)	0.89 (0.11)	1.03 (0.09)	0.93 (0.11)	1.04 (0.08)	0.96 (0.09)	0.91 (0.14)	1.08 (0.07)	1.03 (0.10)
English +/- or other lang spoken	0.84 (0.14)	0.72* (0.09)	0.71* (0.11)	0.75 (0.14)	0.82 (0.11)	0.57* (0.13)	0.86 (0.11)	0.69* (0.12)	0.49* (0.17)	0.85 (0.09)	0.71 (0.14)
Rented home	1.36** (0.13)	1.19* (0.08)	1.20* (0.10)	1.44** (0.18)	1.19* (0.09)	1.95*** (0.25)	1.26** (0.09)	1.38** (0.13)	1.11 (0.17)	1.26*** (0.08)	1.53*** (0.17)
Live in deprived area	1.09 (0.11)	1.09 (0.08)	1.00 (0.08)	1.03 (0.13)	0.98 (0.08)	1.08 (0.13)	1.02 (0.07)	1.06 (0.09)	1.26 (0.16)	0.97 (0.07)	0.97 (0.10)
<i>N</i>	18810	18810	18810	18810	18810	18810	18810	18810	18810	18810	18810

Exponentiated coefficients; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table A4a: Logistic Regression results: smoking, vaping and alcohol use [Odds Ratios]

	Ever Smoked	Smokes Daily	Smoked <15	Ever Vaped	Vapes Daily	Ever Alcohol	Alcohol <15
Mother OHC	1.59* (0.34)	1.50 (0.36)	1.34 (0.25)	1.49 (0.31)	1.08 (0.41)	0.98 (0.30)	1.17 (0.19)
Teenage Characteristics							
Female	1.06 (0.05)	1.08 (0.08)	1.00 (0.05)	0.86*** (0.04)	0.56*** (0.06)	1.09 (0.07)	1.06 (0.04)
Ethnic minority	0.49*** (0.04)	0.43*** (0.08)	0.78** (0.07)	0.67*** (0.05)	0.66 (0.16)	0.31*** (0.03)	0.76** (0.06)
Age	1.51*** (0.11)	1.29* (0.13)	1.10 (0.09)	1.28** (0.09)	1.22 (0.16)	1.95*** (0.20)	0.82** (0.06)
5+ grade 4-9 GCSEs	0.67*** (0.03)	0.50*** (0.05)	0.74*** (0.04)	0.74*** (0.04)	0.68*** (0.07)	1.11 (0.08)	1.02 (0.05)
Family SES							
Workless household	1.24** (0.08)	1.22 (0.12)	1.13 (0.08)	1.01 (0.08)	0.93 (0.15)	0.84* (0.07)	1.05 (0.07)
Mother NVQ2+ quals	0.93 (0.06)	0.94 (0.09)	0.91 (0.07)	0.86* (0.05)	0.99 (0.14)	1.36*** (0.10)	1.07 (0.06)
English +/-or other lang spoken	0.69*** (0.06)	0.66* (0.14)	0.80 (0.09)	0.75*** (0.06)	0.60 (0.17)	0.27*** (0.03)	0.70*** (0.07)
Rented home	1.26*** (0.07)	1.45*** (0.14)	1.21** (0.08)	1.27*** (0.08)	1.16 (0.17)	1.12 (0.09)	1.01 (0.06)
Live in deprived area	0.98 (0.05)	1.02 (0.09)	1.03 (0.07)	1.06 (0.05)	1.17 (0.15)	0.79** (0.06)	0.92 (0.05)
<i>N</i>	18810	18810	18810	18810	18810	18810	18810

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table A4b: Logistic Regression results: drug consumption [Odds Ratios]

	Ever taken drugs	Now take drugs	Ever Cannabis	Ever Cocaine	Ever Ecstasy	Ever Ketamine
Mother OHC	1.55* (0.28)	1.64* (0.38)	1.65** (0.31)	0.93 (0.35)	0.91 (0.27)	0.64 (0.37)
Teenage Characteristics						
Female	0.84*** (0.04)	0.75*** (0.05)	0.85** (0.04)	0.79** (0.07)	0.79** (0.06)	0.71** (0.07)
Ethnic minority	0.81* (0.07)	0.97 (0.12)	0.84* (0.07)	0.63* (0.12)	0.61* (0.12)	0.57* (0.14)
Age	1.50*** (0.11)	1.19* (0.10)	1.44*** (0.11)	1.85*** (0.25)	1.72*** (0.20)	1.54** (0.24)
5+ grade 4-9 GCSEs	0.87* (0.05)	0.96 (0.06)	0.90* (0.05)	0.71*** (0.07)	0.86* (0.07)	0.90 (0.10)
Family SES						
Workless household	1.12 (0.07)	0.97 (0.09)	1.12 (0.08)	1.04 (0.13)	0.97 (0.11)	0.99 (0.17)
Mother NVQ2+ quals	1.13 (0.07)	1.44*** (0.12)	1.16* (0.07)	1.12 (0.14)	1.14 (0.11)	1.28 (0.18)
English +/- or other lang spoken	0.69*** (0.07)	0.62** (0.09)	0.66*** (0.07)	0.82 (0.19)	1.00 (0.18)	0.97 (0.25)
Rented home	1.16 (0.08)	1.08 (0.08)	1.15* (0.08)	1.16 (0.13)	1.10 (0.12)	1.07 (0.15)
Live in deprived area	1.00 (0.06)	0.96 (0.08)	1.00 (0.06)	0.98 (0.10)	1.00 (0.11)	0.95 (0.14)
<i>N</i>	18810	18810	18810	18810	18810	18810

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Appendix Table A5: Logistic Regression results: relationships and sexual engagement
[Odds Ratios]*

	Had a Boy/Girlfriend	Had Sex	Had Sex <16	Unprotected Sex	Been/Made Pregnant
Mother OHC	1.34 (0.28)	1.50 (0.31)	1.13 (0.21)	1.39 (0.30)	1.63 (0.58)
Teenage Characteristics					
Female	1.30*** (0.06)	1.10* (0.05)	0.99 (0.04)	1.06 (0.06)	1.15 (0.18)
Ethnic minority	0.55*** (0.06)	0.49*** (0.04)	0.67*** (0.07)	0.56*** (0.08)	0.68 (0.24)
Age	1.30*** (0.09)	1.83*** (0.12)	1.44*** (0.10)	1.58*** (0.14)	1.81** (0.39)
5+ grade 4-9 GCSEs	0.96 (0.05)	0.85*** (0.04)	0.78*** (0.04)	0.88* (0.05)	0.60** (0.09)
Family SES					
Workless household	1.11 (0.09)	1.10 (0.08)	1.12 (0.08)	0.98 (0.09)	1.51* (0.30)
Mother NVQ2+ quals	0.90 (0.06)	0.99 (0.06)	0.90 (0.05)	1.13 (0.08)	0.94 (0.15)
English +/- or other lang spoken	0.67*** (0.08)	0.44*** (0.06)	0.64*** (0.07)	0.48*** (0.08)	0.21** (0.12)
Rented home	1.24** (0.09)	1.28*** (0.08)	1.33*** (0.08)	1.25** (0.09)	2.15*** (0.47)
Live in deprived area	1.08 (0.06)	1.04 (0.06)	0.97 (0.05)	1.08 (0.07)	0.97 (0.16)
<i>N</i>	18810	18810	18810	18810	18810

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table A6a: Logistic Regression results: victim of misconduct and crime [Odds Ratios]

	Insulted	Spread Gossip	Been Physical	Hit	Stolen	Harrassed	Sent Pictures	Unwelcome sex attn	Assaulted
Mother OHC	1.47* (0.27)	1.14 (0.22)	1.15 (0.25)	0.99 (0.50)	1.57 (0.45)	1.15 (0.30)	1.76* (0.50)	1.26 (0.32)	1.67 (0.81)
Teenage Characteristics									
Female	0.86** (0.04)	1.39*** (0.06)	0.66*** (0.04)	0.40*** (0.07)	0.94 (0.08)	1.34*** (0.08)	1.32*** (0.10)	2.17*** (0.15)	4.68*** (0.85)
Ethnic minority	0.76** (0.07)	0.70*** (0.06)	0.72* (0.09)	0.75 (0.17)	0.90 (0.17)	0.83 (0.10)	0.89 (0.17)	0.96 (0.12)	0.61 (0.19)
Age	1.03 (0.07)	1.12 (0.07)	0.97 (0.08)	0.83 (0.16)	1.11 (0.14)	1.13 (0.11)	1.03 (0.13)	1.16 (0.11)	1.06 (0.23)
5+ grade 4-9 GCSEs	1.10 (0.06)	1.24*** (0.06)	0.85** (0.05)	0.79 (0.12)	0.94 (0.08)	0.92 (0.06)	1.11 (0.11)	1.32** (0.11)	1.08 (0.15)
Family SES									
Workless household	1.01 (0.07)	1.02 (0.07)	1.18 (0.10)	0.94 (0.18)	1.06 (0.13)	1.07 (0.09)	1.18 (0.16)	1.00 (0.11)	1.10 (0.23)
Mother NVQ2+ quals	1.10 (0.07)	1.18** (0.07)	1.05 (0.07)	1.10 (0.19)	0.97 (0.10)	1.00 (0.08)	1.13 (0.13)	1.40** (0.15)	1.79** (0.37)
English +/- or other lang spoken	0.68*** (0.07)	0.89 (0.08)	1.03 (0.15)	1.53 (0.38)	0.86 (0.16)	0.80 (0.11)	0.75 (0.16)	0.93 (0.14)	1.14 (0.34)
Rented home	1.20** (0.08)	1.10 (0.06)	1.07 (0.09)	1.44* (0.26)	1.15 (0.12)	1.20* (0.09)	1.08 (0.12)	1.04 (0.08)	0.78 (0.13)
Live in deprived area	1.05 (0.06)	0.92 (0.05)	0.95 (0.06)	1.14 (0.17)	1.04 (0.11)	0.98 (0.07)	0.95 (0.11)	0.99 (0.09)	1.00 (0.17)
<i>N</i>	18810	18810	18810	18810	18810	18810	18810	18810	18810

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table A6b: Logistic Regression results: contact with police [Odds Ratios]

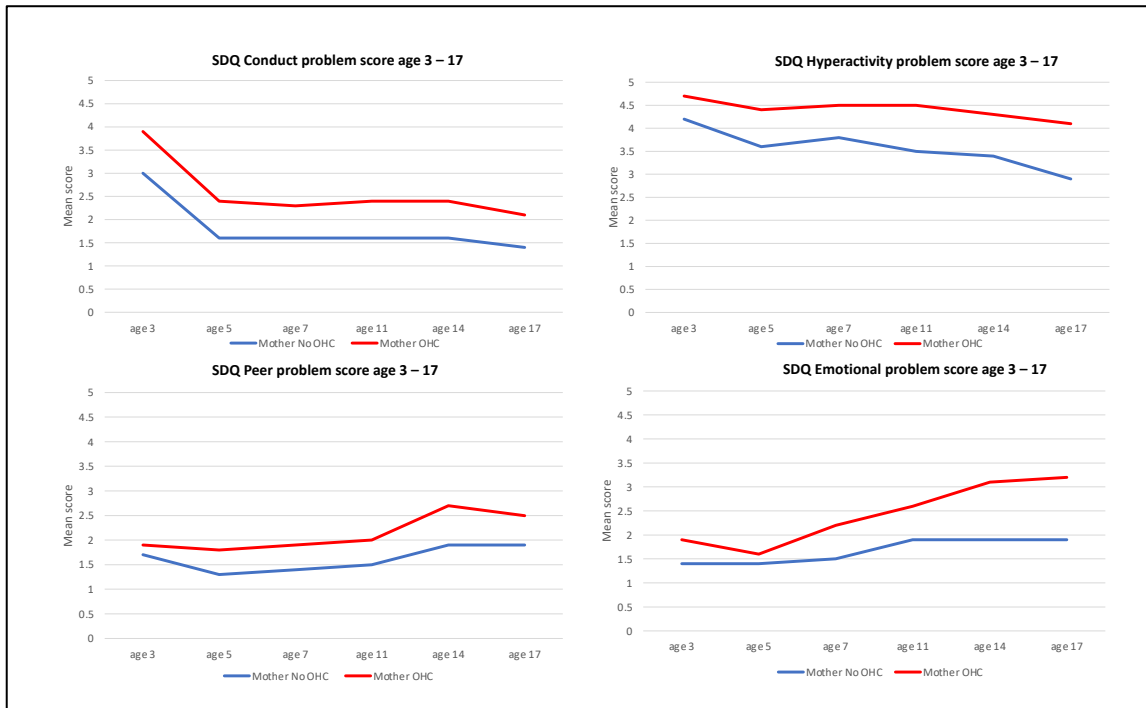
	Stopped & Questioned	Cautioned	Arrested
Mother OHC	1.02 (0.21)	1.99* (0.58)	0.96 (0.55)
Teenage Characteristics			
Female	0.70*** (0.04)	0.77** (0.06)	0.60* (0.14)
Ethnic minority	0.73** (0.08)	0.84 (0.14)	0.98 (0.37)
Age	1.43*** (0.11)	1.06 (0.12)	0.45* (0.14)
5+ grade 4-9 GCSEs	0.61*** (0.04)	0.50*** (0.05)	0.31*** (0.09)
Family SES			
Workless household	1.41*** (0.11)	1.46** (0.17)	1.50 (0.42)
Mother NVQ2+ quals	0.91 (0.06)	0.88 (0.09)	0.90 (0.20)
English +/- or other lang spoken	0.78 (0.11)	0.70 (0.13)	0.83 (0.31)
Rented home	1.18* (0.08)	1.18 (0.13)	1.74* (0.48)
Live in deprived area	1.12 (0.08)	1.03 (0.10)	0.96 (0.24)
<i>N</i>	18810	18810	18810

Exponentiated coefficients; Standard errors in parentheses

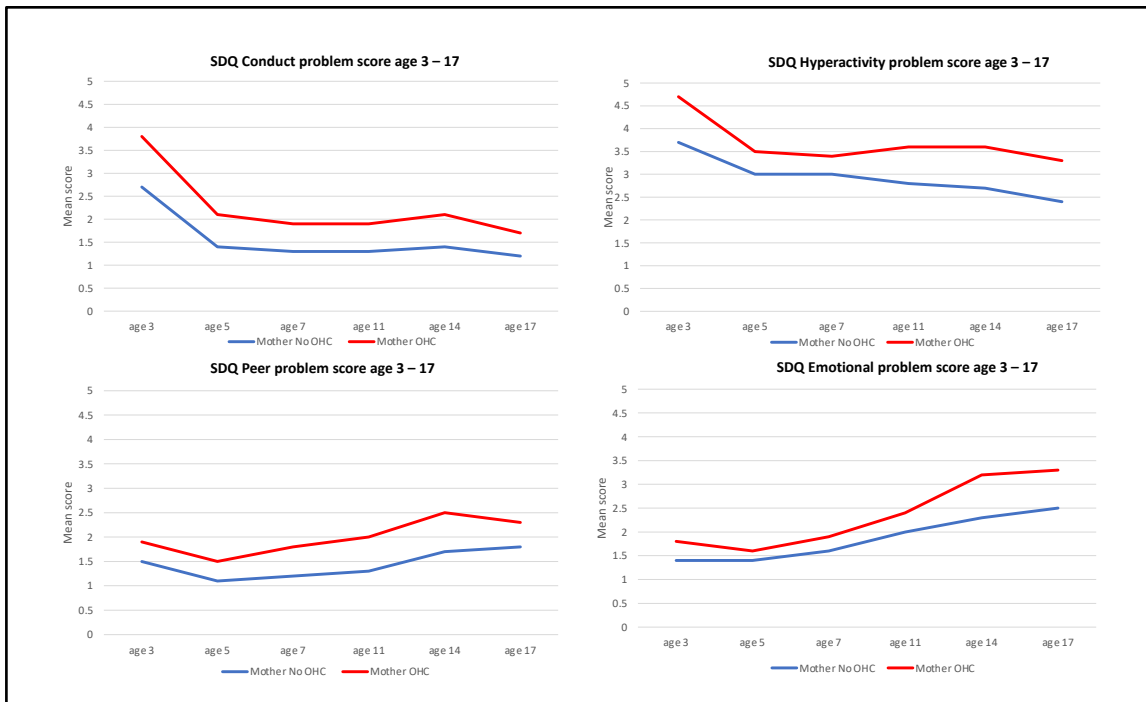
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Figure A1: Mean parent reported SDQ problem scores age 3 – age 17

Males



Females



1.