Children's COMMISSIONER

Characteristics of children entering care for the first time as teenagers

Technical report

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Contents

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Introduction

Even before the pandemic, there were 120,000 teenagers in England (aged 13-17) who were falling through the gaps in education and social care.[1] This group of children – equivalent to 1 in 25 13-17 year olds – included those referred to social care multiple times but who were not allocated a social worker; children who were absent from school or permanently excluded; children with special educational needs who had multiple exclusions from school; and children who missed large portions of school or dropped out of the school system in Year 11. All of these children had significant additional needs which were not being fully met or recognised by the systems designed to help them.

These high levels of vulnerability and unmet need among older children have led to increasing numbers of teenagers being taken into care. Across England, there has been a 26% increase in the number of 13-17 year olds entering care between 2012/13 and 2018/19. The result is that more than a third of the children who entered care in 2018/19 were teenagers – often with complex needs and vulnerabilities the care system itself finds difficult to help. Compared to younger children in care, teenagers in care are 50% more likely to have an Education, Health and Care Plan, ten times more likely to be have attended a pupil referral unit, and six times more likely to be living in a residential or secure children's home.[2]

Being taken into care is a traumatic experience for any child. Where possible children and families should be supported earlier on, to ensure that children can live safely at home with their family and reduce the need for care. Entering care as a teenager can be particularly hard and also suggests a failure to give a family the right help at the right time. This report explores whether more can be done to identify earlier which teenagers are at risk of going into care, so that the right intensive early support can be provided to them and their families.

Children who are older when they enter care are more likely to experience multiple moves from home to home while in care. Nearly one in five children aged 12 to 15 who recently entered care had two or more home moves in a year – that means packing up their whole lives and getting to know a new set of carers every few months. So it is unsurprising that one teenager in care told my team that she felt like a "parcel" being moved around. The trusting relationships which children in care need in order to thrive take time and consistency to build, but for these teenagers there is little chance for those bonds to develop. Teenagers are also more likely than younger children to be placed in children's homes, often far from their family home, which can make maintaining relationships with friends and family that much harder.

The whole idea of being in care often means something different for teenagers than for younger children. Indeed sometimes there is a lack of clarity as to the purpose of taking a teenager into care. Unlike with younger children, it is rare for care to be a long-term plan for these teenagers, and the large majority of them will end up returning to their families.

It is not just that being taken into care as a teenager can be particularly hard, it is also that it suggests a series of missed opportunities. The teenagers we speak to who have entered care can often pinpoint where things started to go wrong, or where a bit of extra help for them, or their parents, might have made all the difference. These are children who have had years of interactions with health, education and other professionals and yet that crucial opportunity was missed.

[1] https://www.childrenscommissioner.gov.uk/report/teenagers-falling-through-the-gaps/
[2] https://www.childrenscommissioner.gov.uk/wp-content/uploads/2019/07/cco-stability-index-2019.pdf

"when I was in school, I wasn't problematic. I just used to not come in or come in late …Lots of warning signs about my situation were missed. They should have sat me down on my own [and tried to talk to me]. I have some issues going on." Girl, (18)

"No one sat us down in school and said, "Right, what's the issue, why don't you want to come in?" …Ask me why I haven't done my work. Like how do you know what I had going on at home like the night before? Girl (16) FE college

The children who end up going into care as teenagers clearly face difficulties at an earlier age; around two-thirds are eligible for free-school meals and just over two thirds have special educational needs. Even before entering care, they are more likely than other children to face instability in school: one in ten has to move school in the middle of the year, and one in three have a fixed term exclusion the year before they enter care. But even with these high levels of need, not enough is done to provide additional support. And there is some suggestion from the data that higher levels of support could have made a difference – although the children who come into care are more likely than other groups to have an identified special educational need or disability, they are less likely to be provided with intensive support from an Education, Health and Care Plan. Yet these children are more likely than younger children to come into care because of a disability. This echoes some of the tentative findings from our report on gangs last year; that gang-associated children were less likely to have these plans in place than other children known to children's services.

Over the past ten years there has been a sea-change in the way we view teenagers. It is not long ago that girls who were being sexually exploited were talked about as 'prostituting themselves'[3]. In 2010, three times as many children were locked up in custody as now. We have slowly begun to understand child criminal exploitation, and to consider children as vulnerable and in need of protection, rather than criminal and in need of punishment. In 2018 the Government's safeguarding guidance for the first time included reference to 'contextual safeguarding', that is keeping children safe from risks outside the home like gangs or child sexual exploitation, rather than abuse or neglect by family. While over half (56%) of teenagers going into care are there because of this familial abuse or neglect (the most common reason), this is a much lower rate than for younger children. A significant group of teenagers do appear to be coming into care because of those 'contextual' risks; for example they are five times more likely to be there because of 'socially unacceptable behaviour'. Our previous work (though based on limited data) has also demonstrated notably higher rates of children coming into care with identified risks from factors such as gangs or sexual exploitation[4] This suggests children who, rather than being caused direct harm by their parents or carers, are being drawn into dangerous or criminal behaviour which parents aren't able to stop. This shows that we need to get better at identifying these external risks, and ensuring the right support is in place.

For this report, we wanted to understand more about these teenagers' experiences before they entered care to see what might have been done to avoid crisis occurring. This report explores the backgrounds of children taken away from their families as teenagers, to understand their characteristics and experiences, and investigate what more can be done to identify these children and give them the help they need before they hit crisis.

The first key finding from this report is that children who end up going into care between the ages of 13

[3] https://www.childrenscommissioner.gov.uk/wp-content/uploads/2017/07/If_only_someone_had_listened.pdf
[4] https://childrenscommissioner.github.io/stabilityindex2019/#appendix-a-trends-in-the-profile-of-teenagers-in-care-2013-2018

and 15 clearly face disadvantages at an earlier age: before they went into care, around two-thirds were eligible for free school meals and just over two thirds had special educational needs. They were also more likely to face instability in school: in the year before entering care, one in ten was out of school for a term, one is six moved school in the middle of the year, one in three was persistently absent, and more than one in three had a fixed-term exclusion.

The second key finding from this report, despite with these high level of needs, they children were often not getting sufficient support either at school or from children's social care. Although these children are more likely to have an identified special educational need or disability, they are less likely to be provided with intensive support from an Education, Health and Care Plan. Our analysis found that a third of the children who come into care as teenagers had not been in contact with children's services in the last 6 years, and only a third of them had a social worker in the two years before they come into care. In the time leading up to the crisis of a child being taken into care, the intensive support for them and their families that we would want to see is too often not in place.

> *"How can a kid who is 14 live on the streets for a year and a half? Where were Social Services at that time? Why did no-one come and get me and put me in care home? I was sleeping in a shed in a back garden with 2 of my mates who was wanted. 14! If I caught a 14-year-old now on the streets and that I would put them into care and that." Boy (16) at a Youth Offending Team (YOT)*

This reinforces what we have learned from previous research on the levels of vulnerability among children in England. The teenagers who do get taken into care are the tip of the iceberg of a much wider group of invisible, vulnerable children. This research confirms that there are many opportunities to intervene to help children that are missed and that there are more children in this country who will not meet the threshold to come into care, or to get an EHC plan or to access mental health care, but who are still struggling – dropping out of school, with special educational needs, and becoming vulnerable to exploitation. Our annual vulnerability report has shown that even before the pandemic there were the 2.3 million children in England growing with vulnerable family circumstances – but less than a fifth of them were being supported by children's social care, while more than a third were not even known to local services.[5]

On the ground these children can be identified, when local systems work well. Those who work with or come into contact with children regularly – teachers, doctors, police, youth workers – can often spot the signs of vulnerability and do something about it. Like the youth worker who notices a young teen suddenly has lots more money to spend and a new phone, and finds out that they are being intimidated by a gang. High threshold levels for help and poor co-ordination means though that often these moments fail to lead to concrete help. Covid has only made this even worse. Last November the number of referrals to children's social care was 12% lower than usual.[6]

Yet such methods of identification are even more important, since this report shows that it is difficult to predict, using central government administrative data alone, which group of children are more likely to end up coming into care, and proactively target them for support. Relying on predictive models based on the data we currently have would mean 80% of the children coming into care would be missed. Within the official government data on which this analysis is based, there is no easily identifiable group of children who stand out as clearly being at higher risk of going into care in future. It is important to remember that the group of children who *need* to come into care will not match perfectly with the group of children who *do* come into care - different areas may also have different thresholds for intervening in

[5] https://www.childrenscommissioner.gov.uk/wp-content/uploads/2019/07/cco-vulnerability-2019-infographic.pdf
[6] https://www.childrenscommissioner.gov.uk/report/too-many-at-risk-children-are-still-invisible-to-social-care/

a family's life, or manage child protection work more or less effectively. Our analysis cannot account for the fact that some children may be at exactly the same level of risk, and yet receive a different intervention.

This highlights the need for better and wider-ranging longitudinal data on vulnerable children, their experiences and their outcomes. The data underpinning the prediction analysis is limited by what is collected and submitted by local authorities to the Department for Education. It is very rarely possible to join up the information on what is happening for children in school and in children's social care to what is happening to them in other areas of their life. For example, we cannot match up this data with information about children's involvement with gangs, the criminal justice system, or acute and mental health services. And this is even more true when it comes to the needs of their parents and carers, or the support services that they are accessing – for example we have no way to join up information about parents' involvement with the criminal justice system, police call-outs for domestic abuse, interactions with adult substance misuse or mental health services, or issues around housing, severe poverty and welfare benefits. Yet these factors may all be key drivers of risk and the eventual need to take a child into care.

Better and wider-ranging data is available at a local level. One of the key successes of the Troubled Families programme has been the creation of data sharing agreements across agencies within local areas. But each area has their own bespoke agreements, different approaches to delivering support, and data recorded in different ways, which means it cannot all be joined up at the national level.

Overall, this report is also a reminder that there are many children in this country who will not meet the threshold to come into care but who are still struggling – missing school, with special educational needs, or living in poverty. These children also need our support, and providing it will pay off in ways well beyond the care system; through improved exam results or increased employment opportunities. There is both a moral and economic case for helping the country's most vulnerable children if we can – boosting life chances, preventing crisis and reducing ongoing costs to the public purse. We cannot continue to leave them to fall through the gaps and into crises that can determine the outcome of the rest of their lives.

Executive summary

Background to this work

Children who go into care as teenagers are disproportionately looked after in expensive, residential placements. They often experience high levels of placement instability while in care and often have quite complex needs by the time they do enter care. Because of this it is important to understand the journeys that these children make through the social care system, and understand whether there may have been opportunities earlier in life where risks could have been identified and additional support provided.

This report presents results of some exploratory analysis of a sample of 3,693 children in England who entered care for the first time aged 13 to 15 between 1st April 2018 and 31st March 2019. It examines the extent to which these children were known to children's and education services prior to being taken into care, based on administrative records in central government data. It also examines how well (if at all) we can use these previous interactions with school and social care systems to predict which children will subsequently be taken into care as teenagers.

This report explores the prevalence of early indicators of need that are available in data collected by schools and local authority children's services and submitted to the Department for Education (DfE) as part of its administrative data collections. It also explores how these rates change in the years running up to children being taken into care. To highlight where these rates are particularly high for children who enter care as teenagers, it compares this group to:

- **Teenagers who are in care but entered prior to the age of 13**. Children who are now teenagers in care but entered care when they were younger and therefore represent children with comparable levels of need but earlier intervention.

- **Teenagers receiving their first contact with children's services aged 13-15 but not going into care** – This allows comparison with a group of children receiving a social care intervention at the same age but at a lower threshold, i.e. a Child In Need (CIN) plan or a Child Protection (CP) plan

- **Teenagers with no contact with children's services aged 13-15.** These are children in the same age range throughout the sample period but who have not needed intervention at any point.

Key findings

Across the early indicators of need that we can derive from children's services and education data, some are consistently higher amongst children who enter care for the first time as teenagers.

- These children have higher levels of identified needs throughout their time prior to entering care. Teens who enter care group are more likely to be eligible for free school meals (FSM) than other groups: around two-thirds are FSM eligible prior to coming into care, and throughout this period they are approximately 50% more likely to be eligible for FSM than children who get a lower level social care intervention as teenagers.

    - Similarly, rates of special educational needs (SEN) are high amongst this group: just over two thirds have had identified SEN at some point prior to being taken into care, compared with 1 in 3 amongst children of the same age without children's social care involvement at age 13-15.

    - However, rates of children accessing higher level SEN support (a statement or EHC plan) before coming into care are lower than for those entering care prior to the age of 13.

- Despite these higher needs, most of these children are not in long term contact with children's services prior to going into care. While around 2 in 3 children who enter care aged 13-15 were in contact with children's services at some point prior to entering care, the proportion having contact in a particular year is reasonably consistent at 1 in 4 up, until 2 years prior to care entry.

Differences between teenagers entering care aged 13-15 and other groups become most marked around 4 years prior to entering care. From this point onwards, rates of absence, exclusions, time out of school and children's services referrals increase notably more amongst children who enter care as teenagers than for other groups in our sample.

Even with these observed differences, accurately predicting which children will enter care or have their first children's services intervention age 13-15 is difficult. Even at age 12 the best performing models we have examined have comparatively low rates of accurate prediction – correctly predicting just under 1 in 4 children going on to have their first children's services intervention aged 13-15 and just under 1 in 5 children entering care for the first time aged 13-15. Rates of precision are also low for these models suggesting a large number of children are incorrectly predicted.

While this suggests there are some children for which there are early warning signs, accurately predicting which children might be taken into care as teenagers from school and children's services data alone is difficult.

A key limitation of this exercise is that it is restricted to data from schools and local authority children's services. Given what we know about underlying vulnerabilities affecting children, it may be that a much wider set of indicators of risk – obtained through linking data between wider agencies – would be needed in order to better forecast which children are at risk entering care. Potential useful additions would be:

- Greater information on family level vulnerabilities, especially for children not currently involved with children's social care. Examples include parental mental health/domestic abuse/substance misuse, police call outs and low level offending and parental involvement with the criminal justice system, housing issues and severe poverty, new spells of welfare benefits or changes in welfare benefits, sibling involvement in crime or gang violence, as well as bereavement.
- Greater information on children's vulnerability – examples include CAMHS referrals and contact with mental health services, low level offending and contact with police/criminal justice system, A&E attendances, contact with alcohol/substance misuse treatment services, missing episodes.

While some of these factors (though not all) are collected centrally via children's services assessment information data quality is low and have only been collected for children assessed since 2014/15. These are also highly limited by the fact they are recorded only for those receiving a children's services referral rather than the wider population known to agencies. Much greater sharing of data between agencies with consistent identifiers would greatly improve levels of early identification.

Aims

This report presents some exploratory analysis, examining the previous contacts with school and children's services amongst children taken into care for the first time between ages 13 and 15 in the year 1st April 2018 to 31st March 2019 (the latest full year covered by the Looked After Children census). As well as presenting descriptive findings

This report focuses on younger teenagers (children aged 13 to 15) for the following reasons:

- These children are taken into care at an older age, meaning it can be more challenging to adjust to a new environment and carer. At the same time, they are not old enough to have the autonomy available to older teenagers if they want it.

- As a result of still being younger teenagers, they spend more time in care than their counterparts who enter at age 16 or older. From the perspective of the child, this means that their placement feels more permanent. From the perspective of a local authority, this means that the child will require greater investment and provision over the course of their time in care.

- Children aged 16 to 17 are less well covered by our key educational dataset (the National Pupil Database) as they may be attending further education institutions and/or be in employment. Focusing on those aged 13-15 allows a consistent dataset to be constructed for this cohort of children with less missing data.

This report aims to explore the following questions:

- **Who are the children entering care as young teenagers?** What do we know about them from the data collected by local authorities? How do they differ from the children entering care at other points in their life?

- **What early indicators of need can be seen for these children in education and children's services data?** Are there signs and characteristics that mark out the children who will need this help? How visible were these children to services earlier in their lives?

- **How well can we predict from education and children's services data which children will get their first social care intervention as teenagers?**

To answer these questions, this report uses the data from the National Pupil Database. This provides information on a variety of characteristics and outcomes of these children including:

- Free school meals eligibility (FSM)
- Identified special educational needs (SEN)
- Absences and exclusions from school
- School moves and time out of school
- Time in alternative provision (AP)
- Attainment at Early Years Foundation Stage (EYFS), Key Stages 1 (KS1) and Key Stage 2 (KS2)

We also link these records to information on children's previous children's services referrals collected through the Children In Need Census via a child's unique pupil numbers[7].

While these sources of data have extensive information on each child's characteristics, academic history, attainment and episodes of support, they lack information on the underlying needs that drive children to need help in the first place.

[7] Note: we exclude a small number of children with duplicated Unique Pupil Numbers. These are likely data quality issues caused by the incorrect assignment of UPNs by a school

Who are the teenagers entering care aged 13-15?

Data on our cohort of teenagers entering care aged 13-15 is taken from the Looked After Children Census, based on data submitted by local authorities about children in their care. It includes all children who entered care between 1st April 2018 and 31st March 2019 while between the ages of 13 and 15. It excludes unaccompanied asylum seeking children (who have a different path into care), those entering as part of respite care and children who had previously entered the care system (and were therefore already known to authorities).

How do they compare to other children entering care in 2018/19?

Between April 2018 and March 2019, 25,344 children entered care for the first time. Of those 3,693 were teenagers aged 13-15 (Table 1).

Table 1: Age distribution of children entering care 2018/19

Age	Number of children entering care 2018/19	% of care entrants 2018/19
Under 1	5,952	23.5%
1 to 12	12,334	48.7%
13 to 15	3,693	14.6%
16 and over	3,365	13.3%
Total	25,344	100%

Children entering care aged 13 to 15 are slightly more likely to be female than male, while children entering at a younger and older age are more likely to be male. In terms of other characteristics (including ethnicity and region, shown below), care entrants aged 13-15 are less likely to be White British than younger children, but more likely than older teenagers. They are notably more likely to come from London and less likely to come from the North of England than younger children, but these trends are both more pronounced in teenagers entering at age 16 and over (Table 2).

Table 2: Demographic characteristics of children entering care in 2018/19, by age upon entry into care

	Under 1	1 to 12	13 to 15	16 and over	All care entrants
Sex					
Male	52.2%	52.7%	49.1%	65.3%	54%
Female	47.8%	47.3%	50.9%	34.7%	46%
Ethnicity					
White (British)	71.1%	70.6%	61.1%	41.5%	65%
White (not British)	4.9%	6.0%	7.4%	7.3%	6%
Asian	2.6%	4.2%	8.3%	10.0%	5%
Black	3.6%	6.0%	9.7%	22.0%	8%
Mixed race	11.7%	9.7%	9.0%	7.6%	10%
Not available	4.6%	1.0%	0.8%	1.4%	2%
Region					
East Midlands	8.3%	7.4%	7.2%	6.5%	7%
East of England	8.9%	8.6%	8.9%	11.3%	9%
London	10.6%	11.7%	18.6%	30.9%	15%

	Under 1	1 to 12	13 to 15	16 and over	All care entrants
North East	9.0%	9.9%	6.4%	2.9%	8%
North West	18.4%	18.6%	15.2%	12.8%	17%
South East	12.4%	12.9%	15.0%	12.7%	13%
South West	8.8%	7.7%	8.7%	7.3%	8%
West Midlands	12.0%	11.7%	10.8%	8.7%	11%
Yorkshire and the Humber	11.5%	11.5%	9.1%	6.9%	11%

Teenagers entering care aged 13-15 tend to enter via different legal routes to other care entrants. Whereas for younger children the most common route into care is through a (permanent or interim) care order, the most common route for teenagers is through Section 20 of the Children's Act. While the reason for this is not shown in the data, it may be related to parents being more willing to consent to children being taken into care when they feel unable to cope or keep their child safe, or potentially to Local Authorities being less willing to pursue care orders for older children. Teenagers can also enter care through youth justice-related pathways, such as being held on remand, which does not apply to younger children (Table 3).

How do their experiences in care differ?

Teenagers aged 13 to 15 entering care for the first time are by far the most likely group to enter a children's home or other secure residential setting (Table 3). These placements are generally more expensive[8] and represent a significant break from life with a family. Teenagers are also more likely to be placed further away from home when they enter care, compared to younger children.

Table 3: Legal status and placement characteristics of children entering care during 2018/19, by age upon entry into care

	Under 1	1 to 12	13 to 15	16 and over	All care entrants
Legal status					
Care order	63.0%	45.6%	21.8%	3.0%	41%
Justice related	0.0%	0.0%	4.9%	13.2%	2%
Emergency protection orders/police protection	8.2%	18.7%	13.8%	4.2%	14%
Section 20	28.7%	35.5%	59.5%	79.6%	43%
Primary need code					
Abuse or neglect	76.9%	72.4%	56.1%	33.4%	66%
Child's disability	0.3%	1.7%	4.8%	3.9%	2%
Parental disability	4.3%	3.5%	1.9%	0.6%	3%
Family in acute stress	5.3%	6.3%	11.2%	10.6%	7%

[8] [IFS Spend on children report]

	Under 1	1 to 12	13 to 15	16 and over	All care entrants
Family dysfunction	11.3%	13.8%	15.5%	15.0%	14%
Socially unacceptable behaviour	0.4%	0.9%	5.4%	10.6%	3%
Low income	0.1%	0.1%	0.1%	0.5%	0.1%
Absent parenting	1.5%	1.3%	5.0%	25.4%	5%
Initial placement type					
Placed with own parents	5.5%	10.6%	5.8%	1.2%	7%
Fostering (with a stranger)	58.1%	54.5%	55.5%	26.2%	52%
Fostering (with a relative or friend)	13.8%	29.4%	14.4%	2.9%	20%
Children's homes (inc. secure/residential care/Residential Special Schools)	0.2%	1.8%	16.5%	6.6%	4%
YOI/Prison	0.0%	0.0%	2.4%	10.3%	2%
Independent/unregulated	0.1%	0.0%	1.9%	51.6%	7%
Other (inc NHS)	22.3%	3.7%	3.5%	1.0%	8%
Placement distance from home					
Under 20 miles	85.7%	88.8%	76.2%	65.3%	83%
Between 20 and 100 miles	12.6%	9.7%	18.5%	16.4%	13%
Over 100 miles	1.7%	1.4%	3.7%	3.8%	2%
Not available/applicable	-	-	1.7%	14.5%	2%

What early indicators of need can be seen for these children in education and children's services data?

This section presents descriptive statistics highlighting where children who enter care for the first time as teenagers have different rates of educational needs and disadvantage, or different rates of contact with children's services. To do this we compare rates of key points of contact with school and children's services with three other groups of children aged 13-15.

1. **Teenagers who are in care but entered prior to the age of 13**. Children who are now teenagers in care but entered care when they were younger and therefore represent children with comparable levels of need but earlier social care intervention.
2. **Teenagers receiving their first contact with children's services aged 13-15 (exc. those entering care)** – This allows comparison with a group of children receiving an intervention at the same age but at a lower threshold – namely a CIN plan or a CP plan
3. **Teenagers with no contact with children's services.** These are children in the same age range throughout the sample period but who have not needed social care intervention at any point.

Table 4 demonstrates the size of each of these groups. This shows that teenagers entering care for the first time aged 13-15 make up a very small proportion of children in the cohort (less than 1%). This has implications for the extent to which it is possible to predict this group effectively, because they are quite rare compared to the broader population of 13-15 year olds.

Table 4: Number of children in each group of our cohort for analysis

Group	Sample size	% of total
Teenagers with first children's services contact aged 13-15 (exc care entrants)	24,734	1.2%
Teenagers who entered care before age 13	16,766	0.8%
Teenagers who are not CIN/CLA	2,019,693	97.8%
Teenagers who entered care aged 13-15	3,410	0.2%

The following section shows for each indicator available in the linked data how the sample of teenage care entrants compares to each comparison group. The data are displayed by year of occurrence, rather than the years in advance of entering care. This is to keep constant potential variation in definitions and data collection across time. For this interpretation then, 2017 covers the period when this cohort are aged 12 to 14. The year 2016 represents the cohort aged 11 to 13, and so on. Children in our teenage care entrants group therefore enter care at some point after the year marked 2018 in the charts below.

Available data on this cohort

In the sections below we examine if there are differences between our teenage care entrants and the 3 comparison groups outlined above on variables available in the National Pupil Database (available back to 2007) and the Children in Need Census (available back to 2012/13). To ensure that proportions are not reduced due to poor data coverage for younger children (i.e. where children are below compulsory school age and in private nurseries), charts below are restricted to those aged 6 or over and from the years 2009 onwards (where available).

We include in our descriptive analysis the following variables:

Variable	Data source	Notes
Children's services referrals	CIN Census	Available from 2012/13 onwards
Open CIN episodes	CIN Census	Available from 2012/13 onwards
Section 47 enquiries	CIN Census	Available from 2012/13 onwards
Open Child protection plans	CIN Census	Available from 2012/13 onwards
SEN status	Pupil level school census	Split by whether a child has a statement/EHC plan or whether they have identified SEN but no statement/EHC plan (formerly school action/school action plus and latterly known as SEN support). Rates of the latter category decrease notably after 2014 due to reforms to SEN thresholds. Includes children recorded as having an SEN status at any of the 3 termly school censuses. Proportions are limited to those in school at any point during the year.
Primary SEN type	Pupil level school census	Taken from the spring census of each year. Proportions are limited to those matched with the spring term school census.
Free school meals eligibility	Pupil level school census	Includes children recorded as being FSM eligible at any of the 3 termly school censuses. Proportions are limited to those in school at any point during the year.
Mid-year school moves	Pupil level school census	Counts children whose school entry date is after the 3rd week of September. We exclude entry dates that change due to a school's academisation. Proportions are limited to those in school at any point during the year.
Terms not matched in the school census	Pupil level school census	Counts children matched in at least one school census during the year but not all 3 based on a child's anonymised pupil matching reference.
Overall % of sessions absent during the year	Pupil level absence return	Calculated as the total number of sessions missed during the year divided by a child's total possible sessions. Note: both numerator and denominator are summed across all schools enrolled in during the year. Proportions are limited to those in school at any point during the year. Persistent absence refers to children missing more than 10% of possible sessions.
% of sessions missed during the year due to unauthorised absence	Pupil level absence return	Calculated as the number of sessions missed during the year due to unauthorised absence divided by a child's total possible sessions. Note: both numerator and denominator are summed across all schools enrolled in during the year. Proportions are limited to those in school at any point during the year. Persistent unauthorised absence refers to children missing more than 10% of possible sessions due to unauthorised absence.

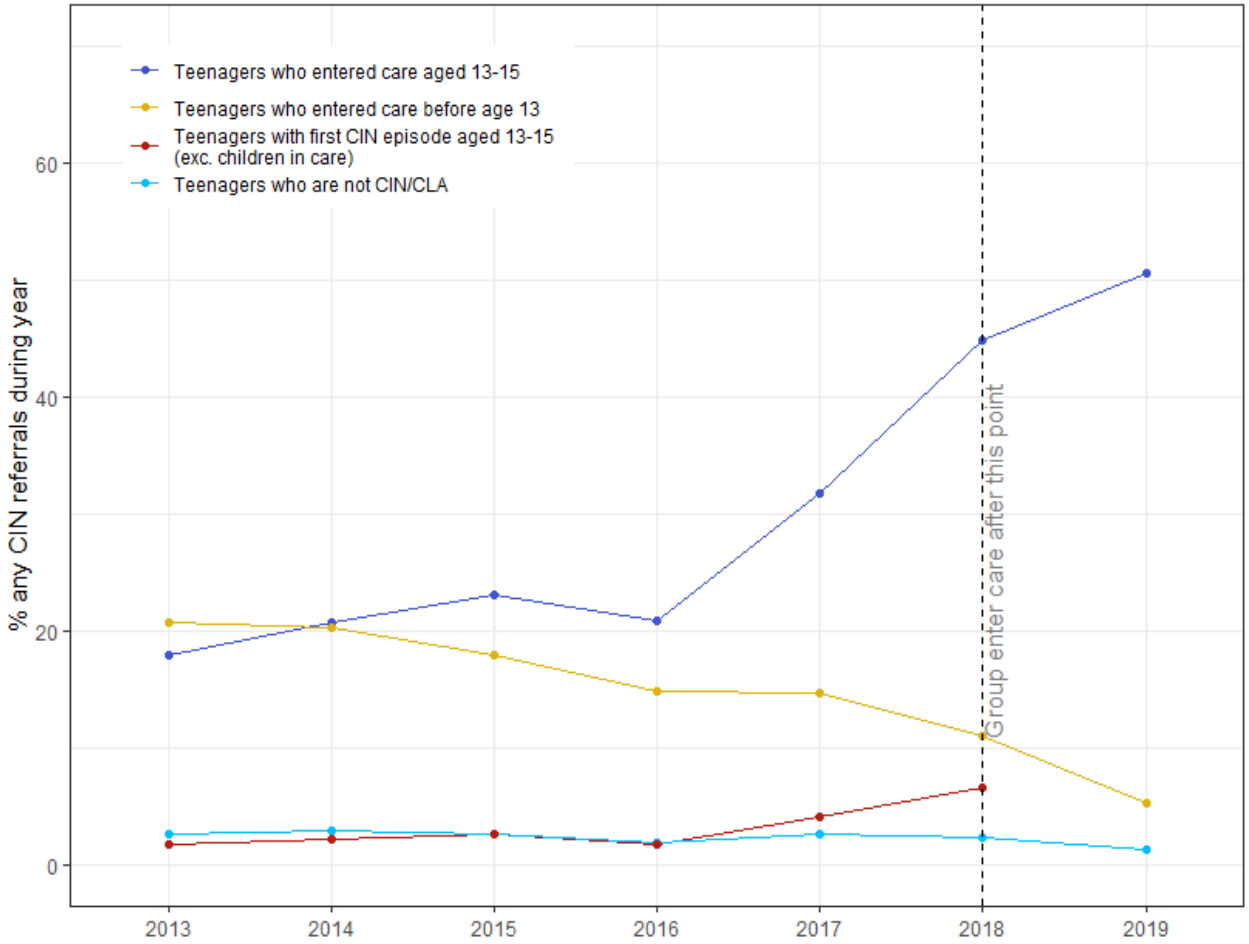
Variable	Data source	Notes
Number of fixed term exclusions during the year	Pupil level exclusions return	Limited to children that are in school at any point in the year.
Number of permanent exclusions during the year	Pupil level exclusions return	Limited to children that are in school at any point in the year.
Whether child is enrolled in a PRU at the January school census date	Pupil level school census & PRU census	Prior to 2013/14 information collected via the PRU census in January each year. Subsequently collected as part of the spring term school census.
Average percentile rank on KS2 reading and maths	Pupil level KS2 results data	Calculated as the average of a child's percentile rank (amongst members of this cohort taking the exams in the same year) on their English and maths points scores. For those taking KS2 after 2015/16 this is based on their scaled point scores. For those prior it is based on fine graded scores. Limited to children with valid KS2 results and sitting them at the end of year 6.
Average percentile rank on KS1 reading and maths	Pupil level KS1 results data	Calculated as the average of a child's percentile rank on their English and maths points scores (amongst members of this cohort taking the exams in the same year). Limited to children with valid KS2 results and sitting them at the end of year 3.
Percentile rank on Early Years Foundation Stage Profile (EYFS) total score	Pupil level EYFS results data	Calculated as percentile rank amongst members of this cohort assessed in the same year. Note all of this cohort were assessed under the old EYFS framework so based on total point score out of 117.

Previous contacts with children's services

Data on children's services comes from the CIN census, which can only provide information on children in the 2018/19 sample as far back as 2013, i.e. 5 years before entering care (or equivalent).

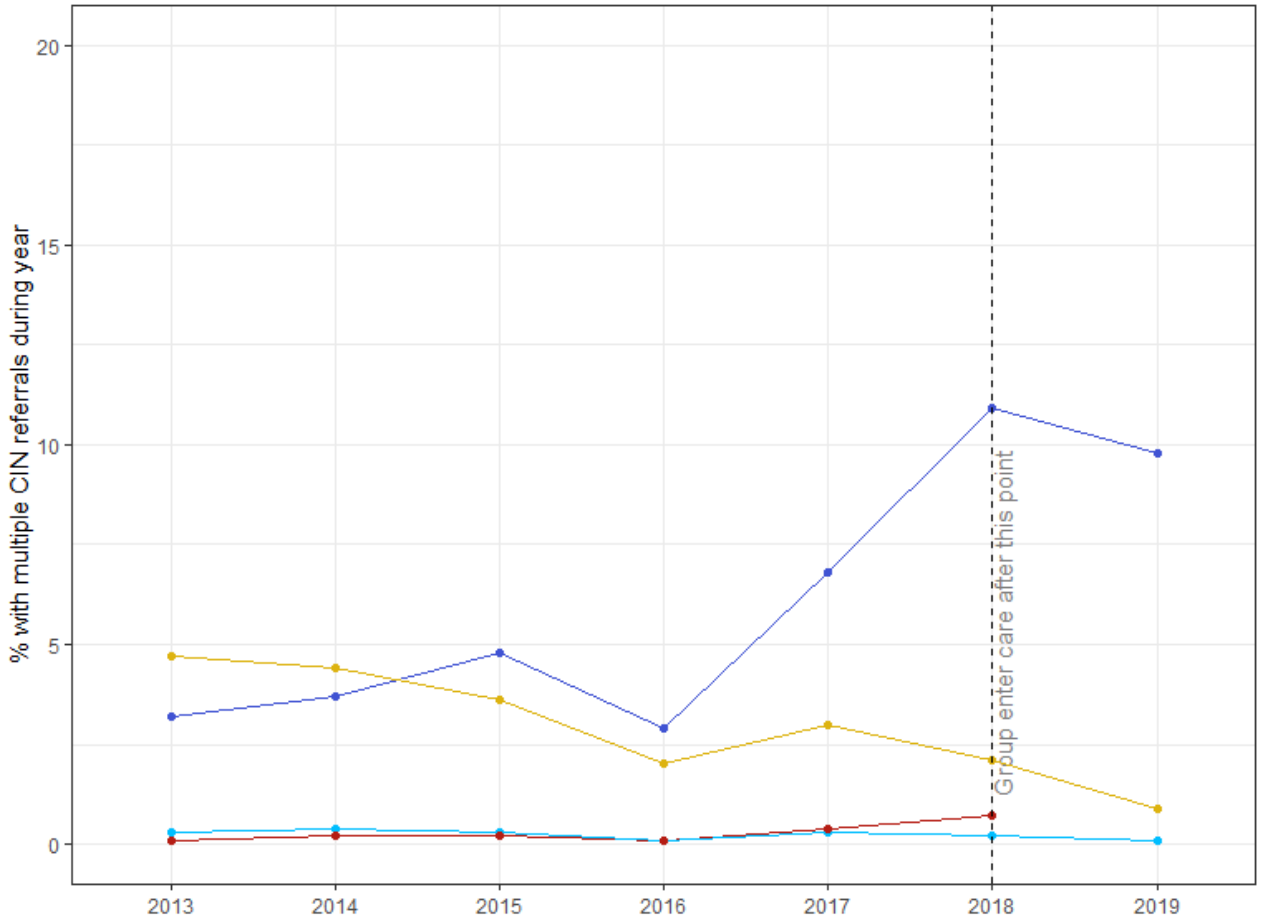
Children who enter care aged 13-15 were more likely have had a previous referral to children's social care than the other groups in the cohort. By 2017 nearly two thirds of our teenage care entrant group had had a referral to children's services since 2012/13. Furthermore, in the last full year before any children in the sample are taken into care, just over 30% of children were referred to children's services. By contrast, the likelihood of receiving a CIN referral for the wider population of children remained flat at around 1%. The difference between the teenage care entrants and other comparison groups appears to emerge most strongly between 2016 and 2017, roughly 1-2 years before entering care, where rates more than double from around 20% with a referral during the year to 45% in 2018 (Figure 1).

Figure 1: Rates of children referred to children's services for teenagers entering care aged 13-15 compared to other groups in our sample *Note: by definition nearly all of the group receiving their first CIN episode aged 13-15 have a referral in 2019 and so this point is excluded from this figure*



A similar discrepancy occurs for the rate of multiple CIN referrals: children who go on to enter care as teenagers are more likely to have multiple CIN referrals in a given year. Just over 10% of this group had multiple referrals in 2018 (Figure 2).

Figure 2: Rates of children with multiple referrals in a year to children's services for teenagers entering care aged 13-15 compared to other groups in our sample *Note: by definition nearly all of the group receiving their first CIN episode aged 13-15 have a referral in 2019 and so this point is excluded from this figure.*



Once a child has been referred, the local authority then decides whether a child meets the threshold for intervention and open a CIN episode for each child. By definition, each of the children in our comparison groups should be on a CIN episode by the end of the sample period, as all looked after children are also children in need. However, Figure 3 demonstrates that the proportion of teenage care entrants with a CIN episode increases dramatically after 2016, more than doubling from 30% to 63% in 2018. In 2017 just over 60% of children who enter care aged 13-15 have had an open CIN episode since 2012/13.

Figure 3: Rates of open CIN episodes during the year for teenagers entering care aged 13-15 and comparison groups. *Note: by definition the group with their first CIN episode in 2018/19 have no prior open CIN episodes and so are not shown on this chart*

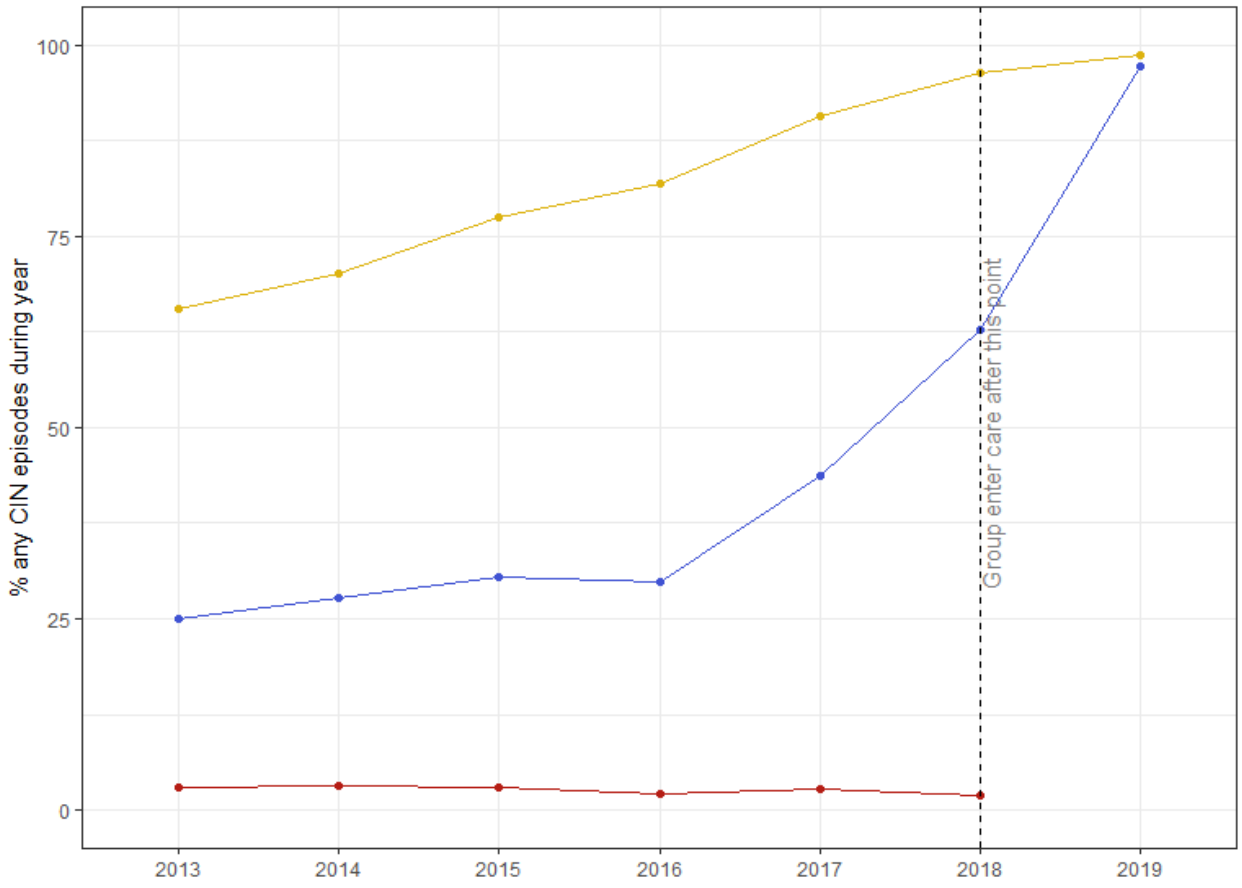


Figure 4 below demonstrates that the rate of section 47 enquiries also increases dramatically amongst this group that enter care as teenagers in the 2 years prior to care entry. Rates increase from around 10% in 2016 to just over 30% in 2018.

Figure 4: Rates of S47 enquiries amongst children entering care for the first time aged 13-15 *Note: by definition the group with their first CIN episode in 2018/19 have no prior open CIN episodes and so are not shown on this chart. The none 0% figures in 2019 for teenagers who entered care prior to that year is likely due to data quality issues between the CIN and LAC censuses and likely reflects children who had section 47 enquiries prior to going into care*

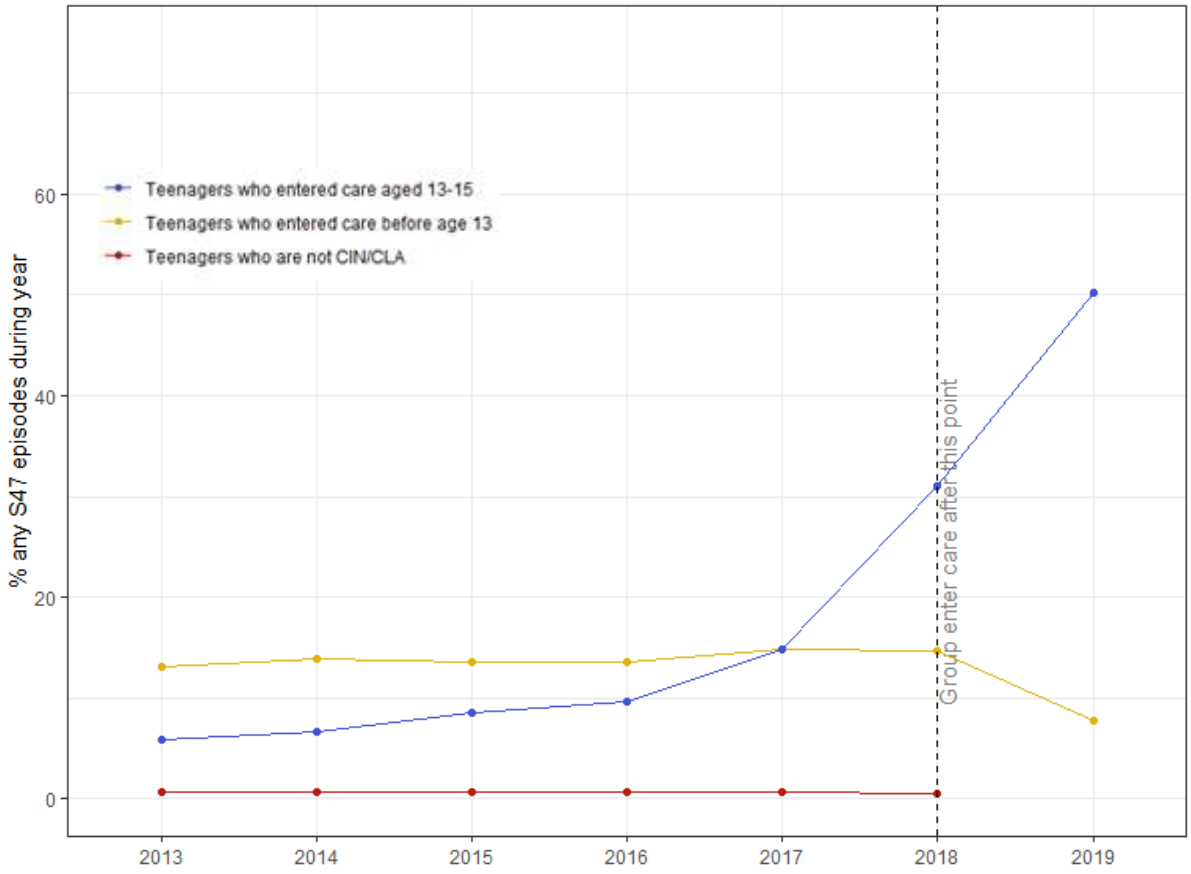
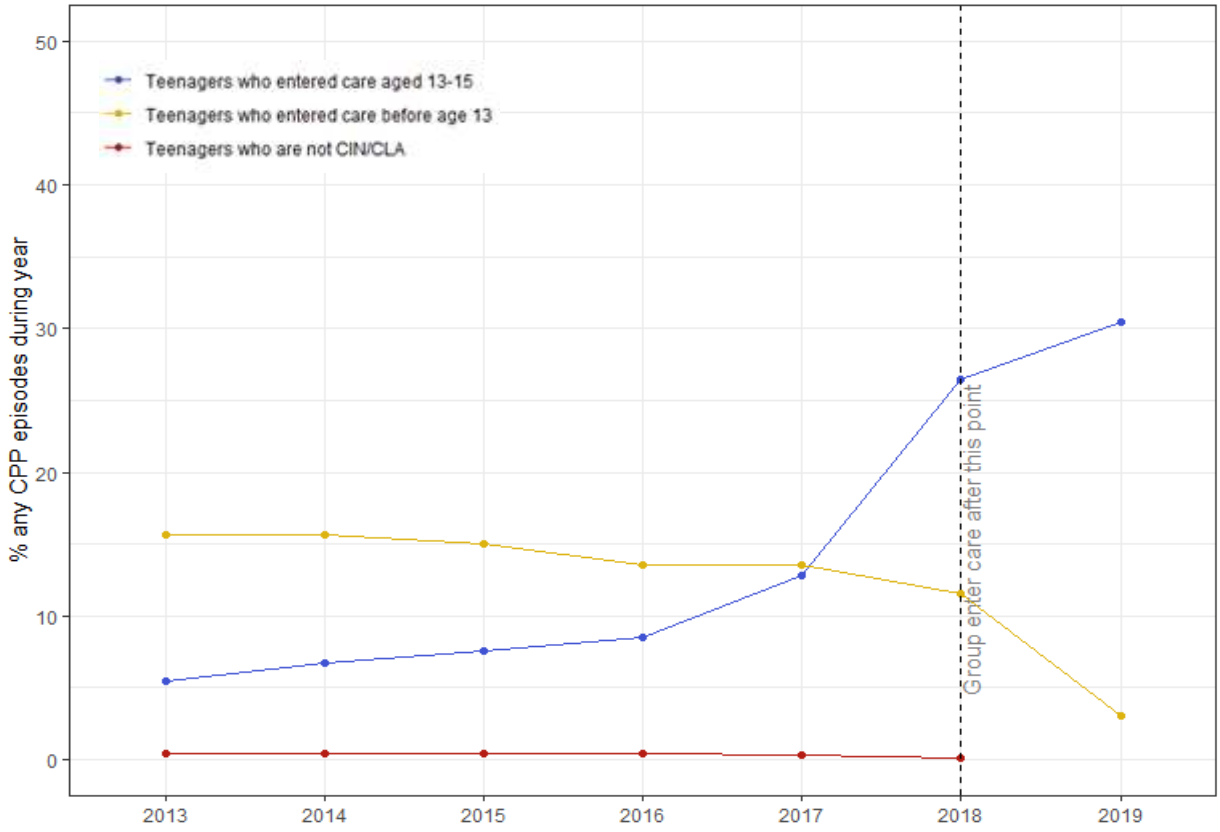


Figure 5 below similarly demonstrates that there is a marked increase in rates of this group starting child protection plans (CPP) during the two years previous to entering care. Rates amongst children entering care for the first time aged 13-15 increase from just over 8% in 2016 to 27% in 2018.

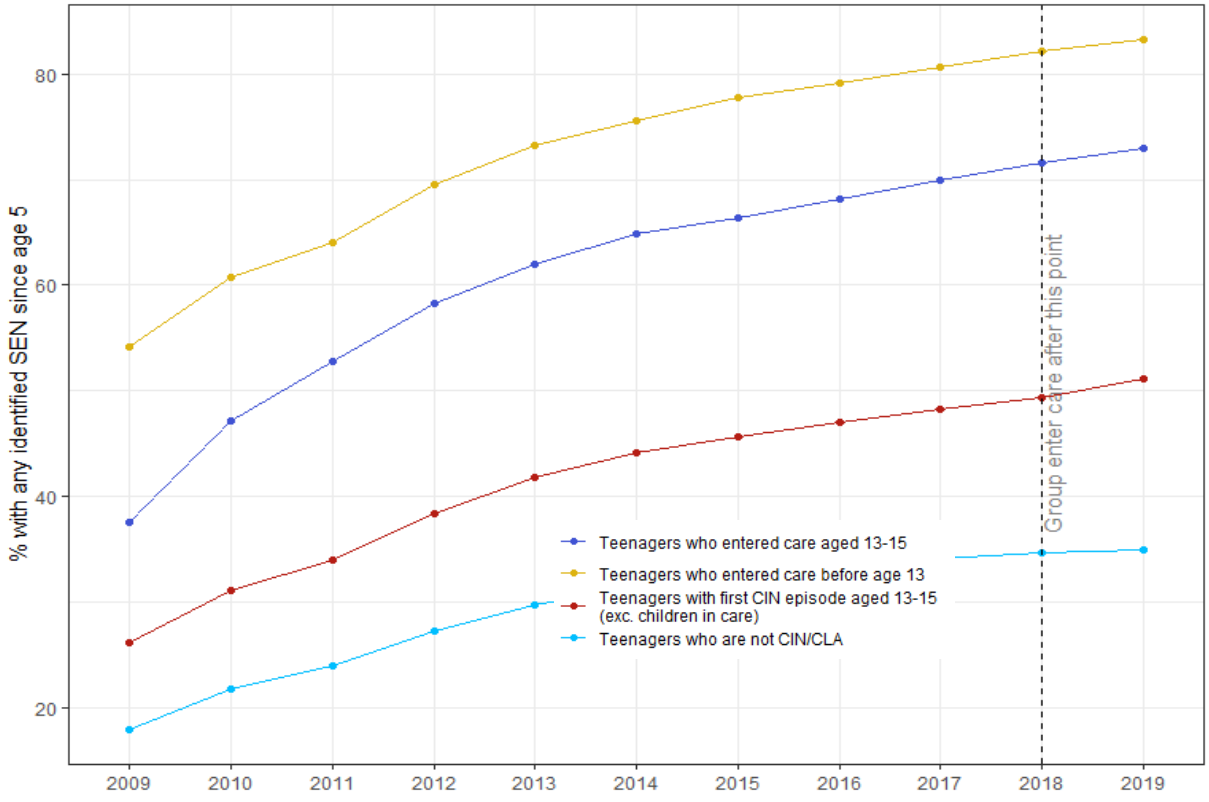
Figure 5: rates of children with any child protection plan during the year amongst children entering care aged 13-15. *Note: by definition the group with their first CIN episode in 2018/19 have no prior CPP episodes and so are not shown on this chart. The 0% figures in 2019 for teenagers who entered care prior to that year is likely due to data quality issues between the CIN and LAC censuses and likely reflects children who had a CPP prior to going into care*



Previously identified SEN

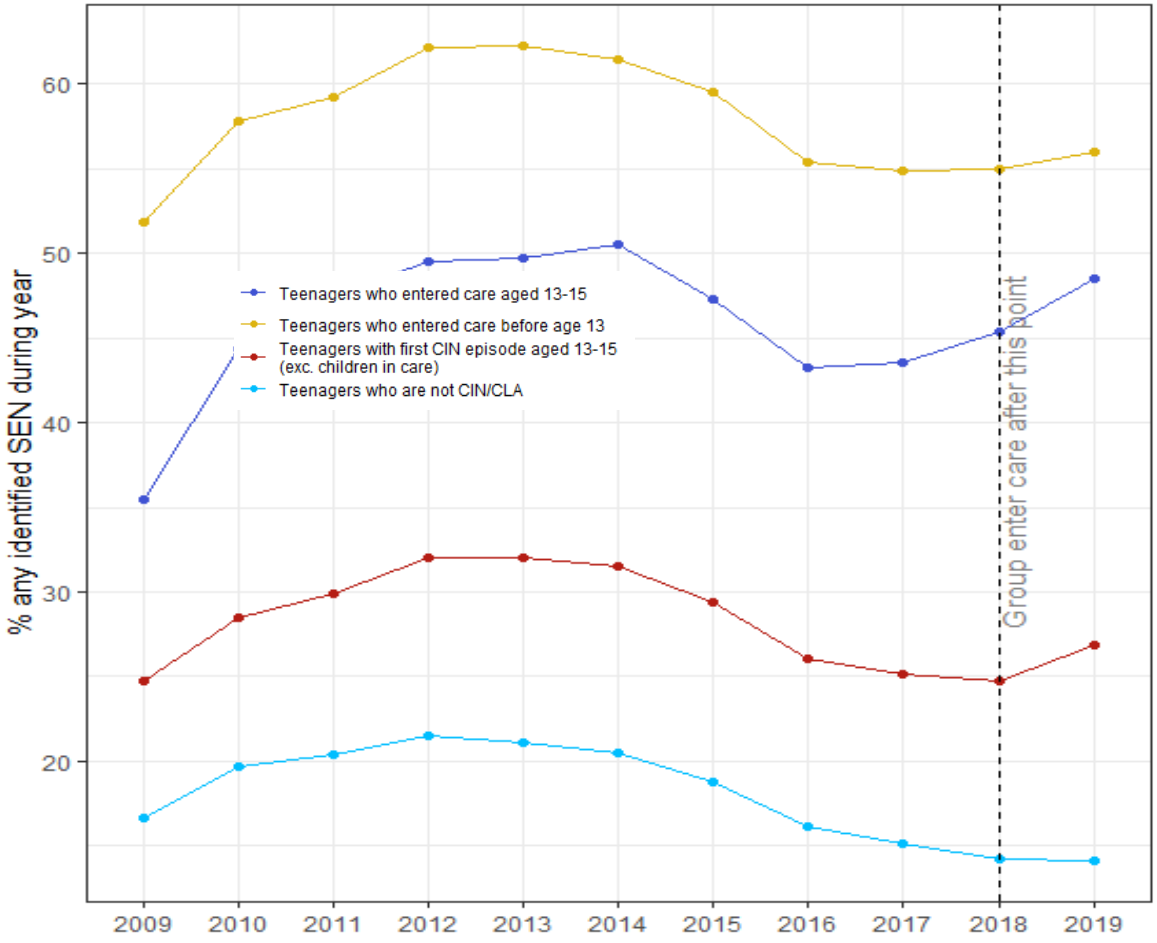
Figures 6 and 7 below show demonstrate that children entering care as teenagers have high rates of identified SEN but that these rates are less than children taken into care earlier in life. Figure 6 demonstrates that over 70% of these children have received SEN support at some point since 2009.

Figure 6: Rates of children with any identified SEN at any point since 2009 for children in this sample



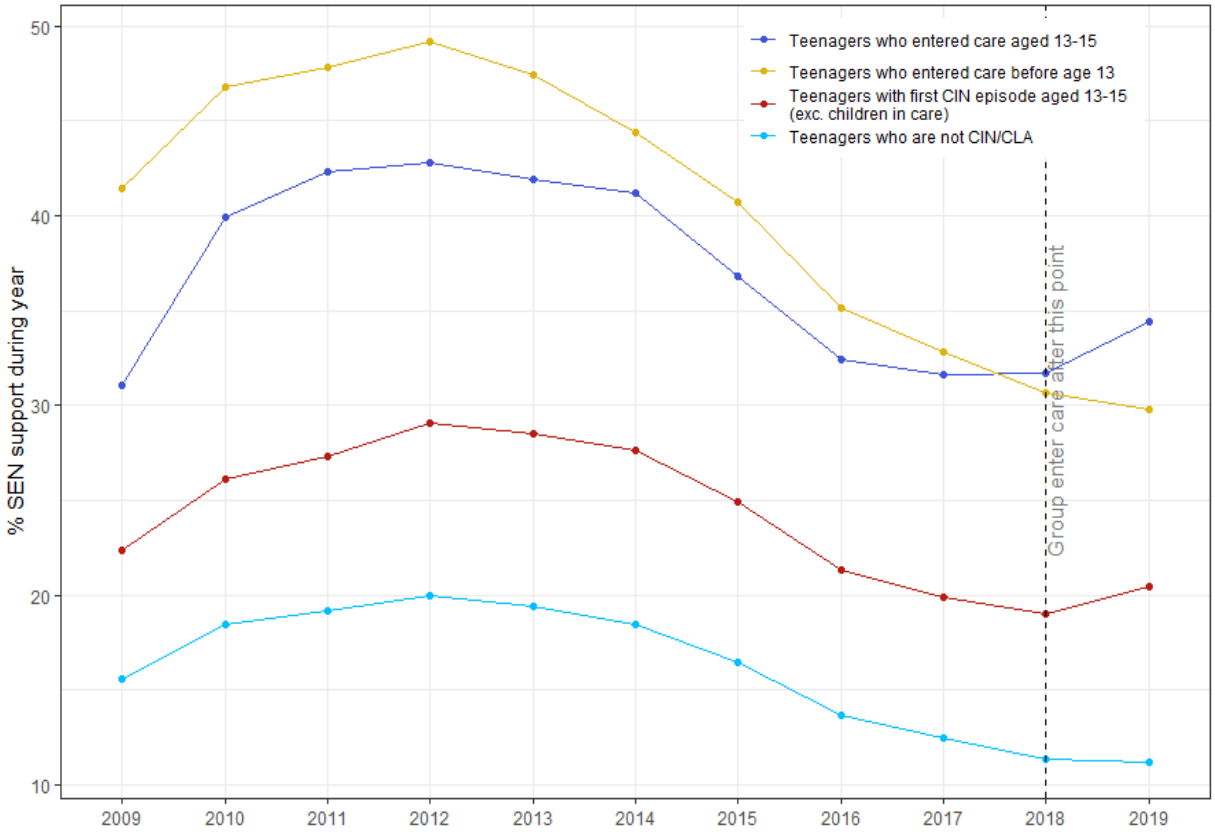
However there are slight differences in trends between the groups in contact with the care system. Figure 7 demonstrates a slight increase in rates of SEN amongst this group taken into care later between 2016 and 2018 that is not as pronounced for other groups.

Figure 7: Rates of children with any identified SEN during the year for children in this cohort



This is primarily driven by greater rises in children receiving lower level SEN support amongst children who enter care aged 13-15. By comparison those who enter care prior to turning 13 have seen a large decrease in rates since 2014 (Figure 8), down from 50% in 2014 to just over 30% in 2018.

Figure 8: Rates of children receiving SEN support at a lower threshold (latterly known as SEN support but previously known as School Action/School Action Plus) at any point since 2009 for children in this sample



This partly reflects children in care prior to turning 13 transitioning to higher level support. Figure 9 demonstrates a faster rate of increase in rates of children with a statement/EHC plan amongst those taken into care prior to their 13th birthday, up 7 percentage points from 18% in 2014 to 25% in 2018. This compares to a 4 percentage point rise amongst children who enter care aged 13-15 up from 10% in 2014 to 14% in 2018.

Figure 9: Rates of children with a statement/EHC plan during the year amongst groups in this cohort

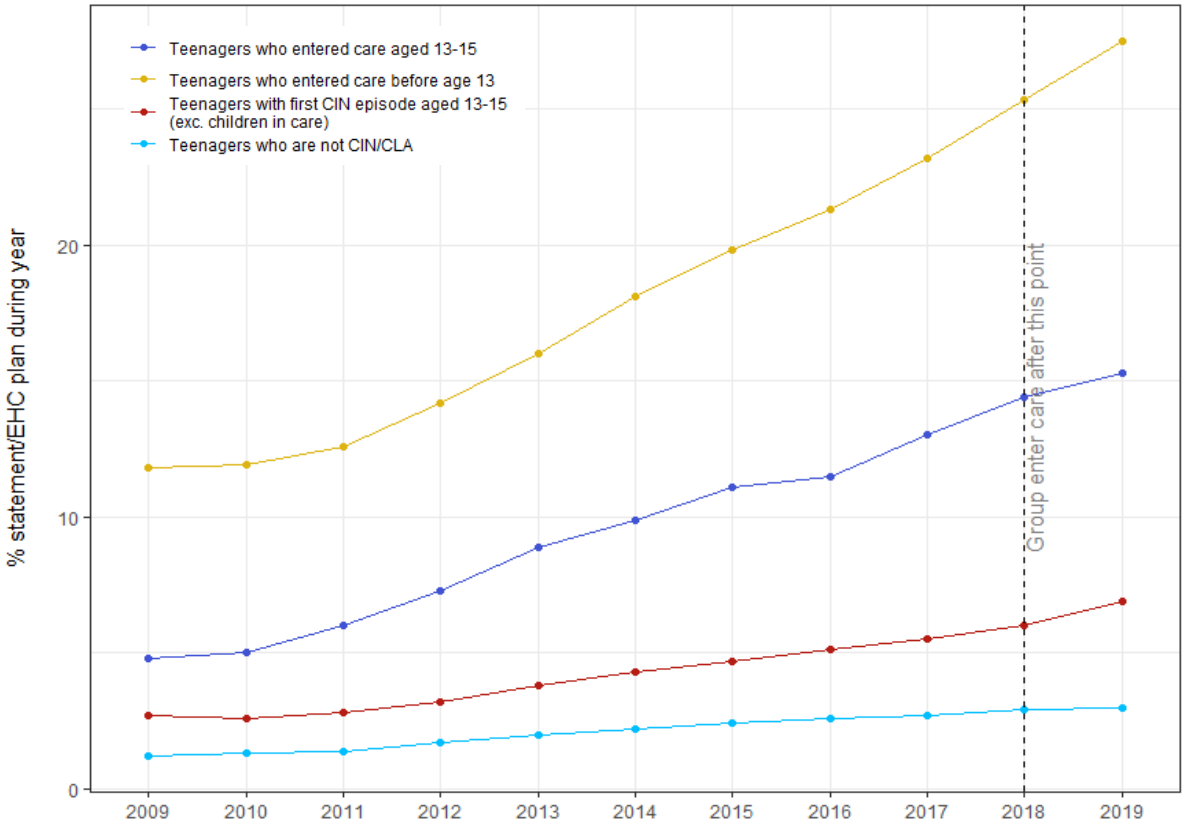
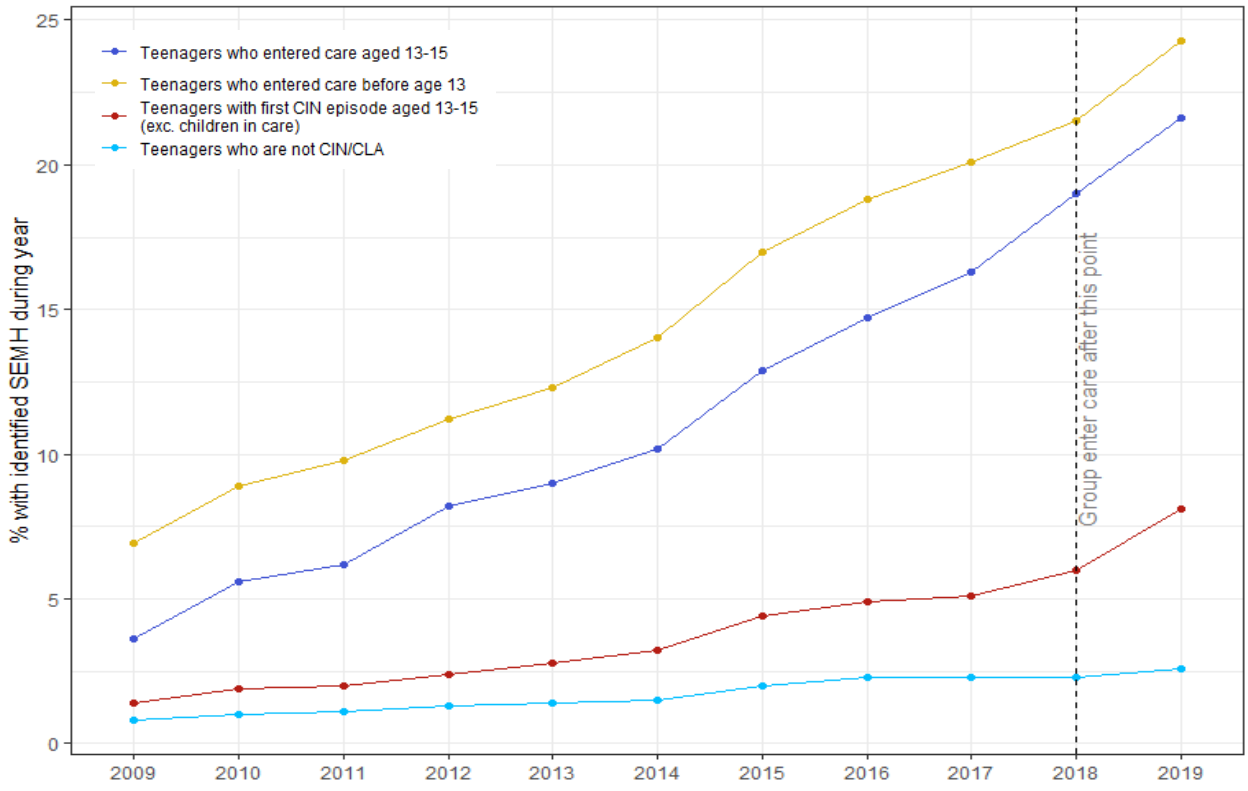


Figure 10 shows that both groups of teenagers who are in care are considerably more likely to have social and emotional mental health needs (SEMH), and that these proportions grow at a faster rate than other groups in this cohort as they age. In 2018 around 1 in 5 children in both groups that enter care in this cohort had identified SEMH, compared to just under 1 in 20 amongst the group getting a lower level intervention as teenagers

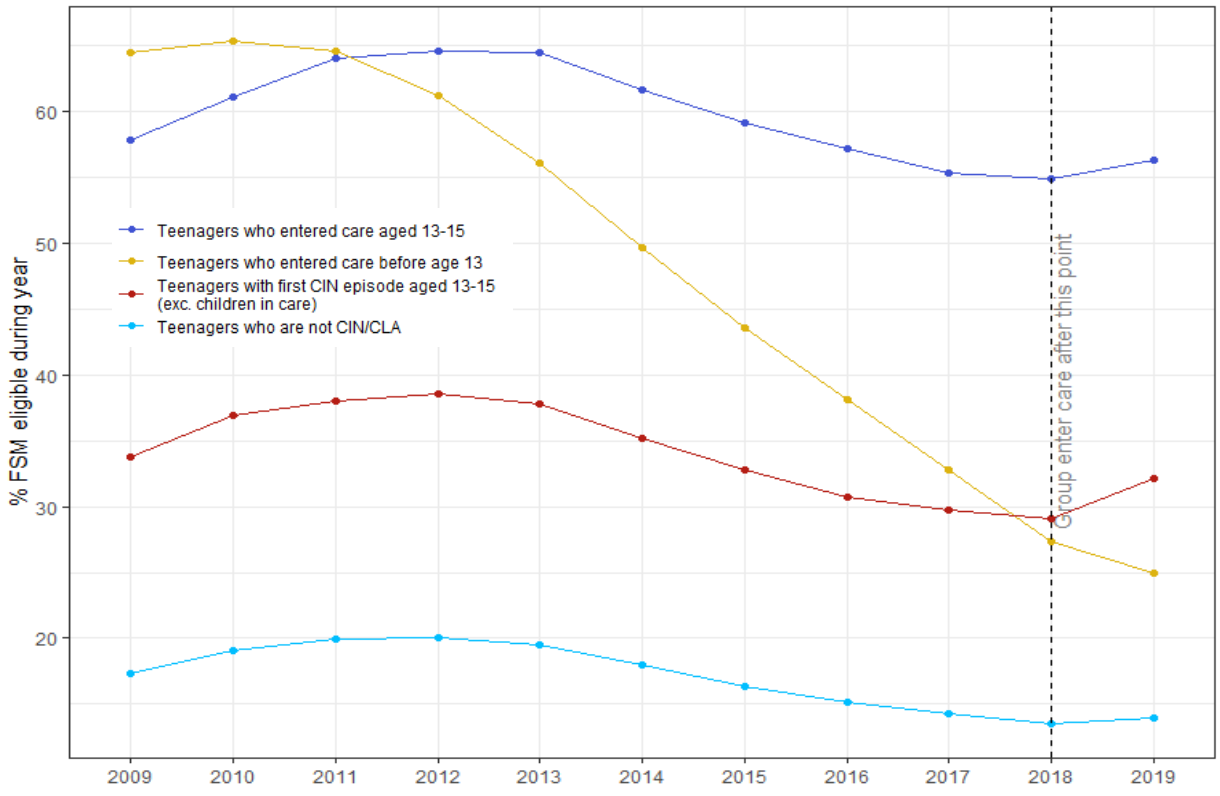
Figure 10: Rates of children with identified social, emotional and mental health needs during the year in this cohort



Economic disadvantage and FSM

Children entering care aged 13-15 are more likely to be eligible for FSM than other groups in our cohort. Figure 11 demonstrates that the pathways for all bar one of the groups in this cohort follow a roughly similar shape but at very different levels. The proportion of children FSM eligible increases over time up to a peak between 2011 and 2013 before declining, but that peak is noticeably higher for children who go on to enter care as teenagers (65% compared to just under 40% of teenagers with their first CIN episode aged 13-15). The exception is children who enter care prior to their 13th birthday where rates decrease rapidly from 2011 onwards. This likely reflects children being taken into care and moving in with foster carers (or other placement providers) that may not be FSM eligible.

Figure 11: Rates of children eligible for free school meals (FSM) in this cohort

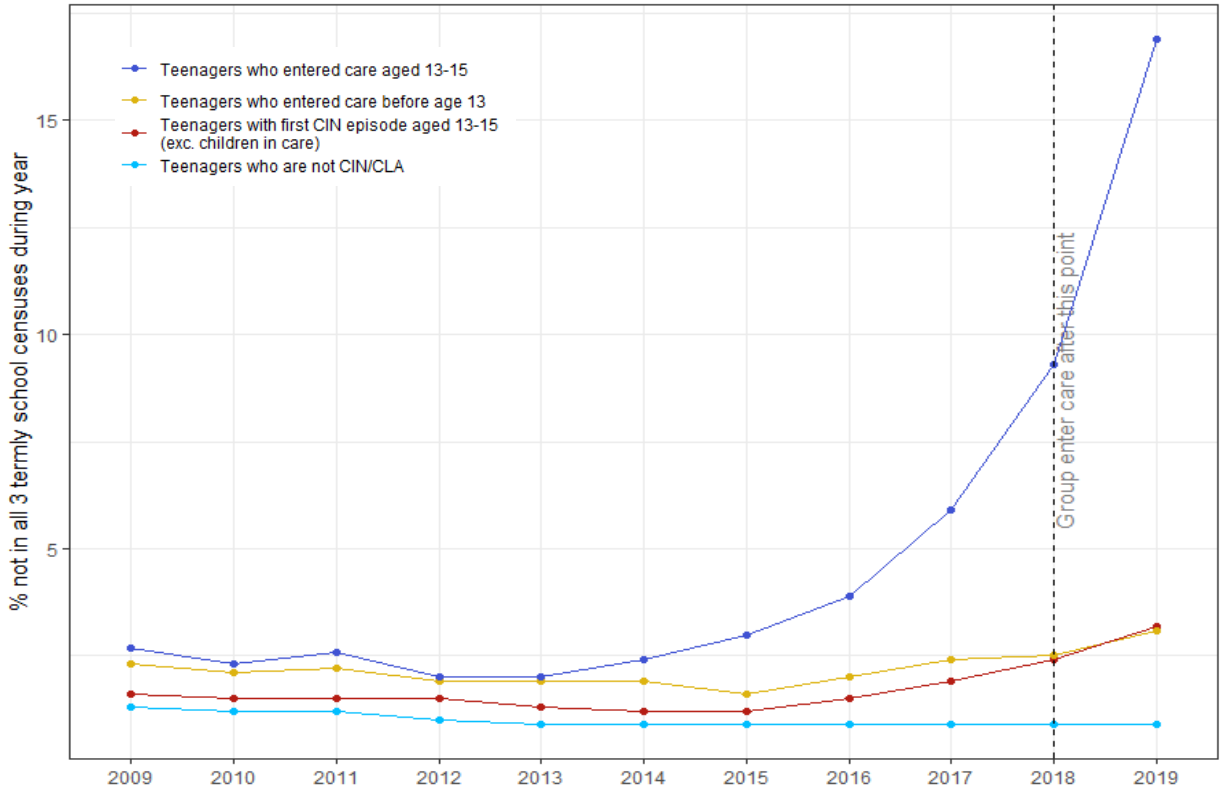


School instability

The National Pupil Database (NPD) is a termly census of children enrolled in a state-funded school at a particular date each term. Children who are not enrolled at any state-funded school on the school census date will not appear in that term's school census.

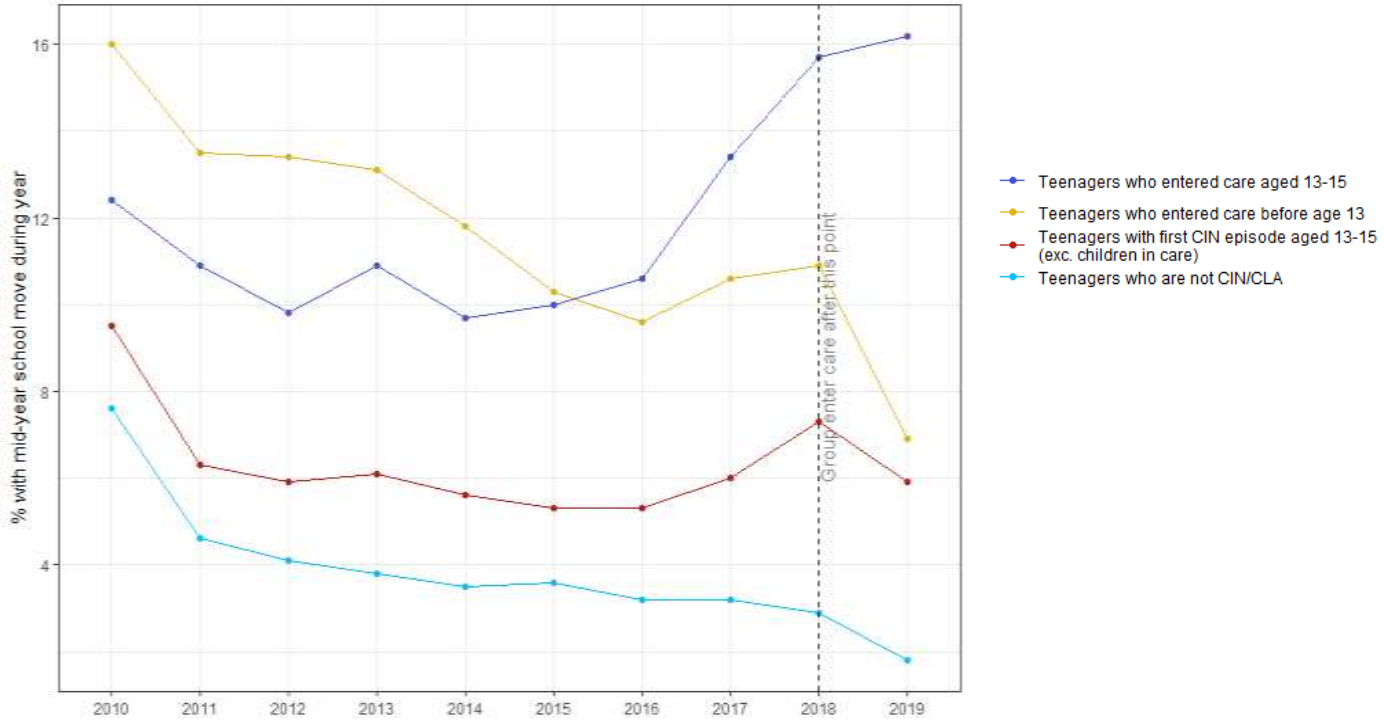
Figure 12 demonstrates children who go on to enter care as teenagers are systematically more likely to be missing from at least one of the termly school censuses in a year at every point in their life than comparable groups of children. This discrepancy increases in the lead up to their entry into care, starting between 2013 and 2014 where rates are at 2.5%. By the time children in our sample of teenage care entrants are beginning to be taken into care in 2018, 1 in 10 are missing from at least one school census in the year, compared to around 1 in 40 in children taken into care prior to their 13th birthday.

Figure 12: Rates of children not matched in at least one of the 3 termly school censuses during the year
Note: Percentages are limited to children matched to at least one school census during the year to avoid counting children entering private education or other establishments not covered by the national pupil database



There are larger differences between the groups in this cohort in terms of proportions experiencing at least one mid-year school move during the year. These rates are consistently higher amongst teenagers entering care aged 13-15 than those receiving a lower level intervention (around 10% compared to 6%). They also increase notably from 2 years prior to entering care up to 16% experiencing a mid-year move in 2018. Children who enter care earlier in life however see declining rates of mid-year school moves during the same period (Figure 13).

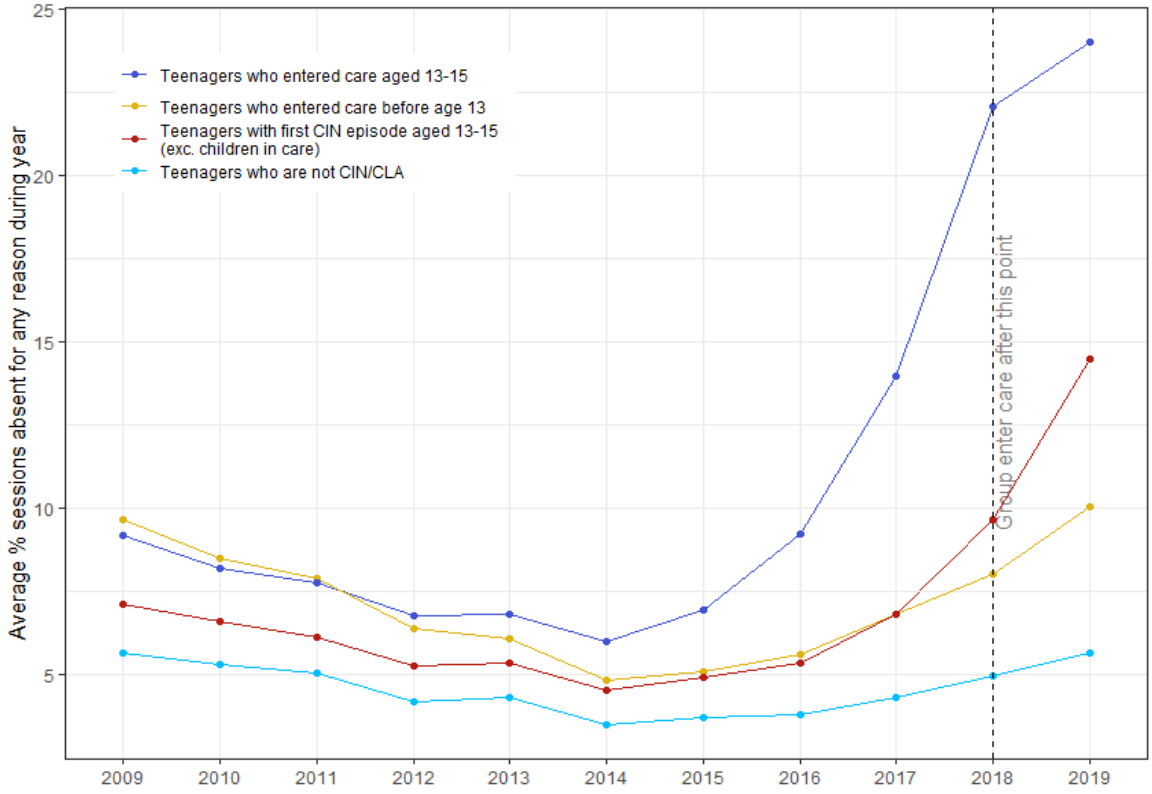
Figure 13: Rates of children experiencing a mid-year school move during the year *Note: Mid-year school moves are defined as school entry dates after the 3rd week of September. We exclude entry dates that change due to academisation*



Absences

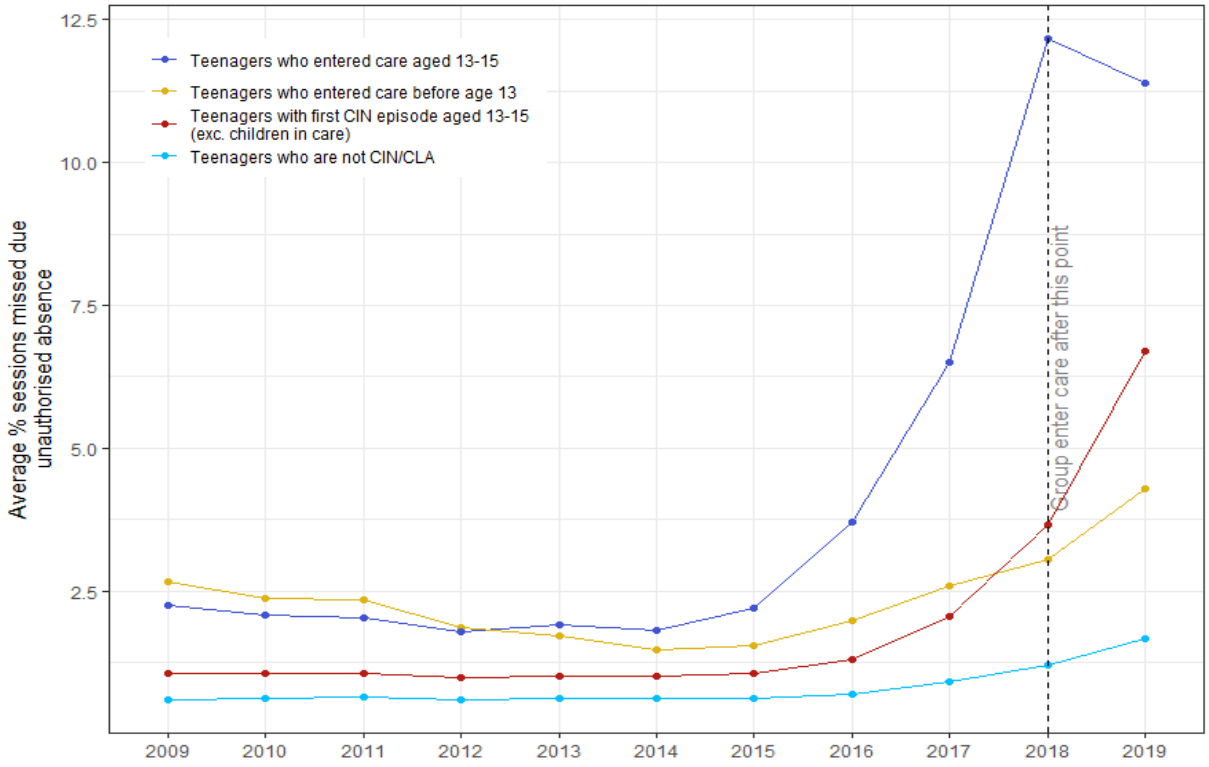
Teenagers entering care aged 13-15 have higher rates of absence than all comparator groups included in this cohort and these rates increase at a faster rate from around 4 years prior to entering care. Figure 14 demonstrates that on average children entering care aged 13-15 missed just over 1 in 5 sessions (due to both authorised and unauthorised absence) during 2018 up from 1 in 20 sessions 4 years earlier. This compares to an increase of 2.5 percentage points amongst teenagers who entered care prior to the age of 13 (5% up to 7.5% in 2018).

Figure 14: Average rates of annual sessions missed for groups in this cohort. *Note: Rates based on possible sessions over 5 half terms for comparability with earlier years*



There is a similar pattern when we focus on children's unauthorised absence (Figure 15).

Figure 15: Average rates of annual sessions missed due to unauthorised absence for groups in this cohort. *Note: Rates based on possible sessions over 5 half terms for comparability with earlier years*



Persistent absence refers to when a child has missed 10 percent or more of possible sessions in a term. Figure 16 shows that children who enter care as teenagers have consistently higher rates of persistent absence than other comparator groups, however this rate increases markedly from around 4 years prior to entering care. In 2014, 17% of our group who entered care aged 13-15 were persistently absent, rising to over half in 2018.

Figure 16: Rates of persistent absence for groups in this cohort. *Note: Rates based on possible sessions over 5 half terms for comparability with earlier years*

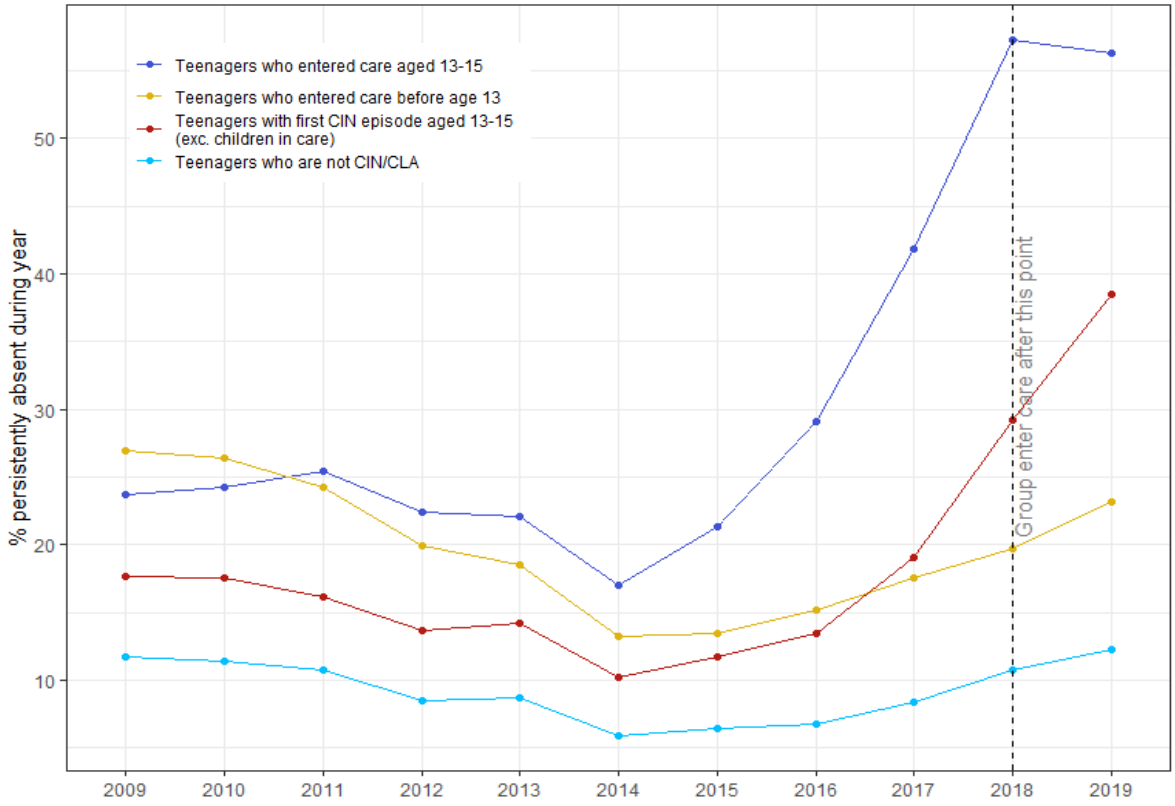
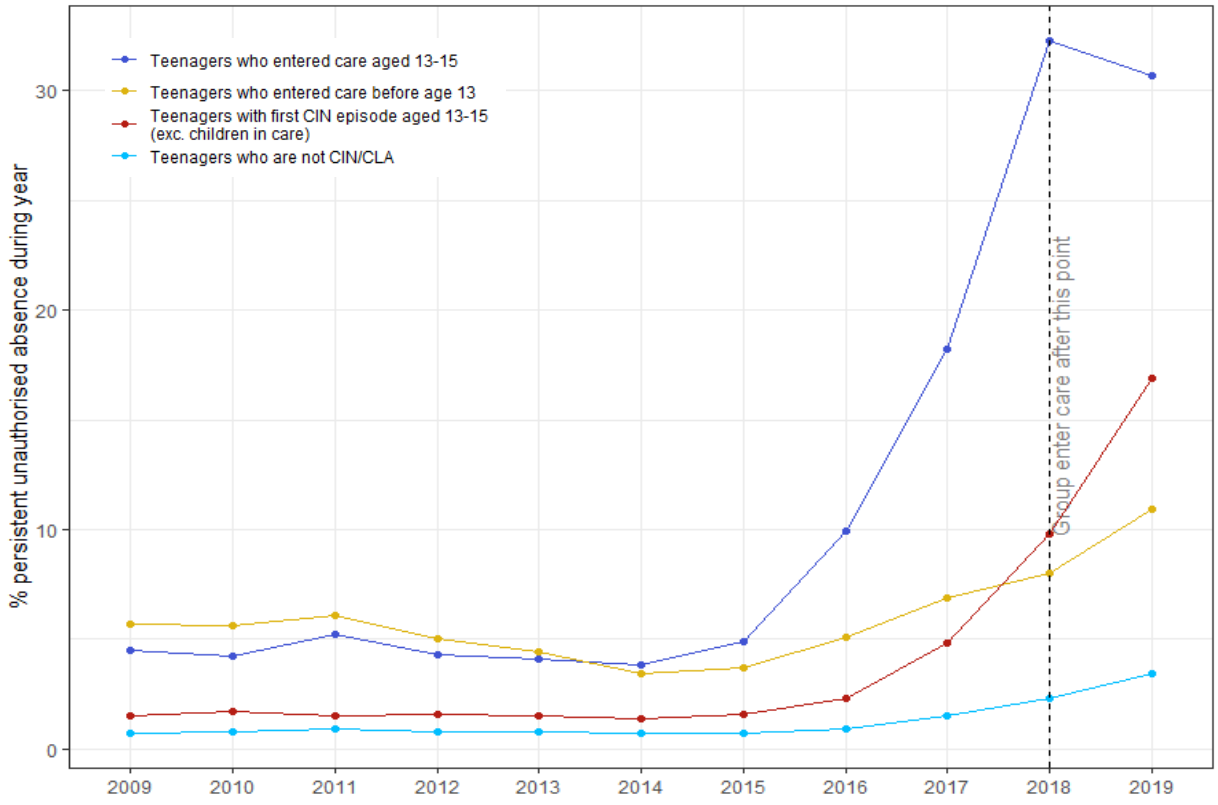


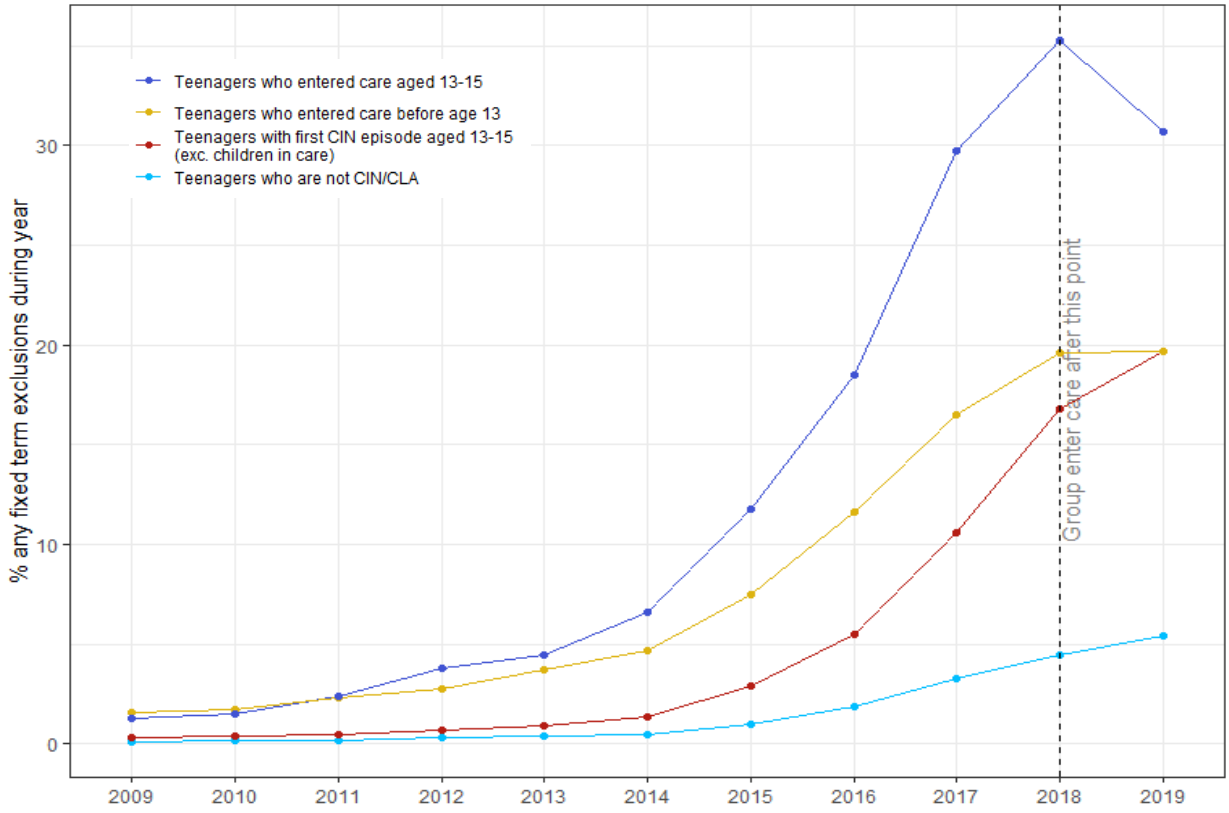
Figure 17: Rates of persistent unauthorised absence for groups in this cohort. *Note: Defined as missing more than 10% of possible sessions in a year due to unauthorised absence. Rates based on possible sessions over 5 half terms for comparability with earlier years*



Exclusions

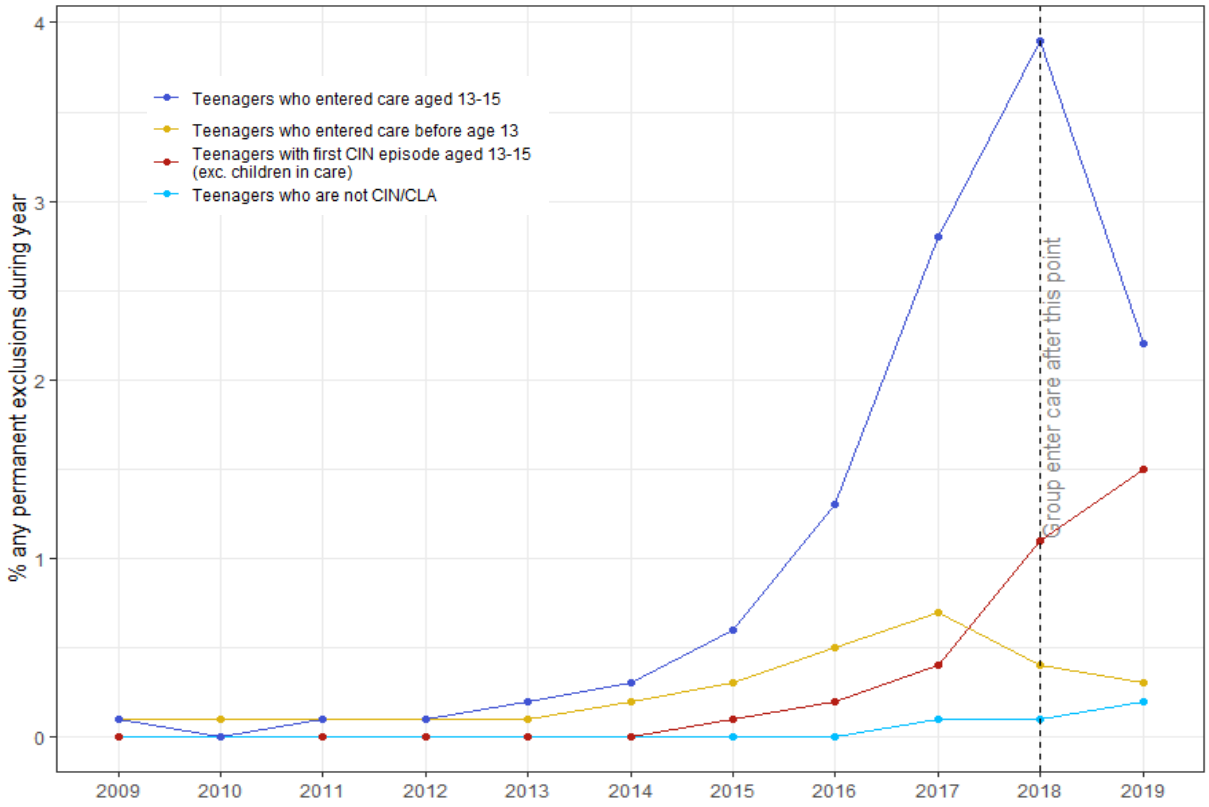
Children who enter care earlier and children who enter care as teenagers see similar levels of exclusions between 2009 and 2013. However these rates diverge from 2014 onwards with greater increases amongst those entering care aged 13-15. In the last full year before they are taken into care, 30% of teenagers entering care receive a fixed term exclusion, compared to less than 5% for the wider population of children (Figure 17).

Figure 17: Rates of children with any fixed term exclusions during the year by groups in this cohort



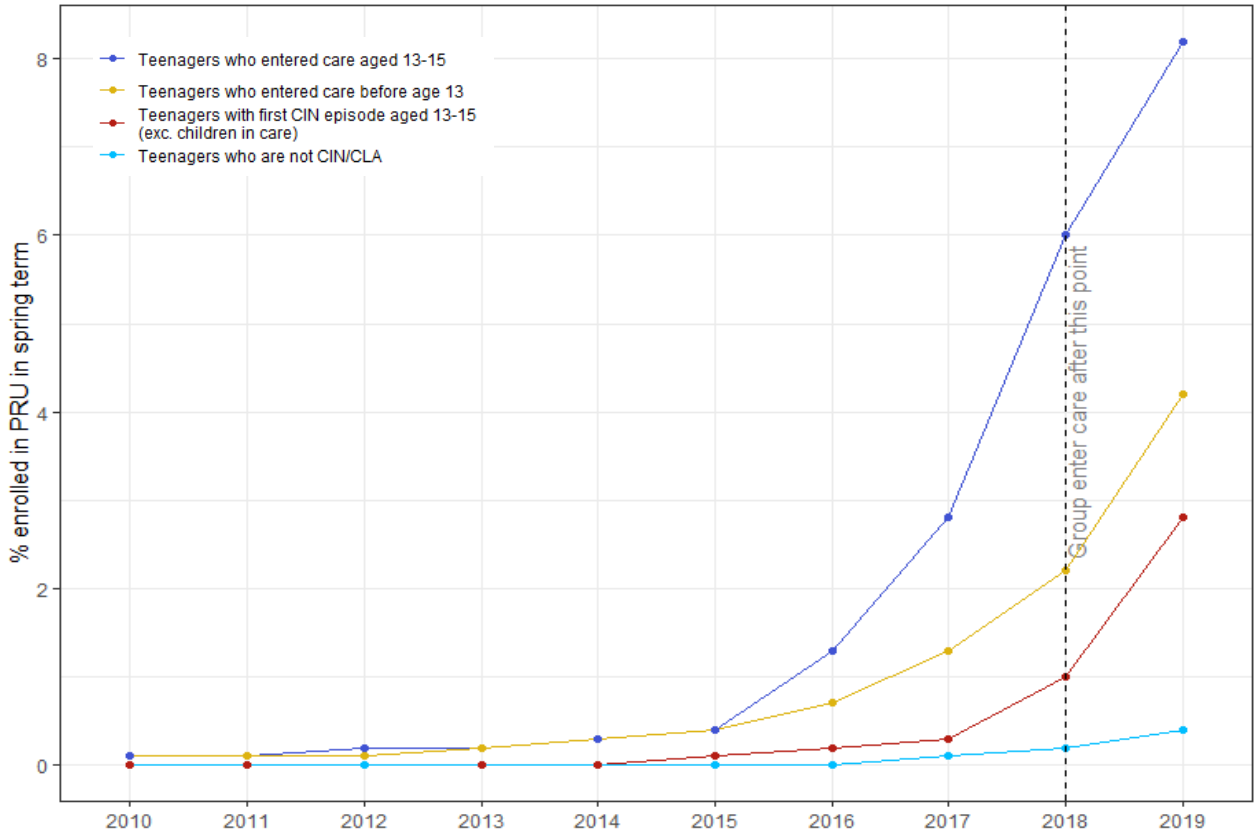
Very low proportions of each group experience a permanent exclusion in a year. However, children entering care aged 13-15 experience a notably higher increase in rate from 2014 onwards than other groups in this sample up from 0.3% in 2014 to 3.9% in 2018 (Figure 18).

Figure 18: Rates of children with any permanent exclusions during the year by groups in this cohort



The patterns from permanent exclusions are repeated for children enrolled in a PRU. Children who enter care as teenagers see a large increase in the proportion enrolled in a PRU, with the gap widening (relative to other comparison groups) from between 2015 and 2016 (Figure 19).

Figure 19: Rates of children enrolled in a PRU at the Spring school census each year *Note: data prior to 2014 taken from the annual PRU census based on children enrolled at a date in January each year*

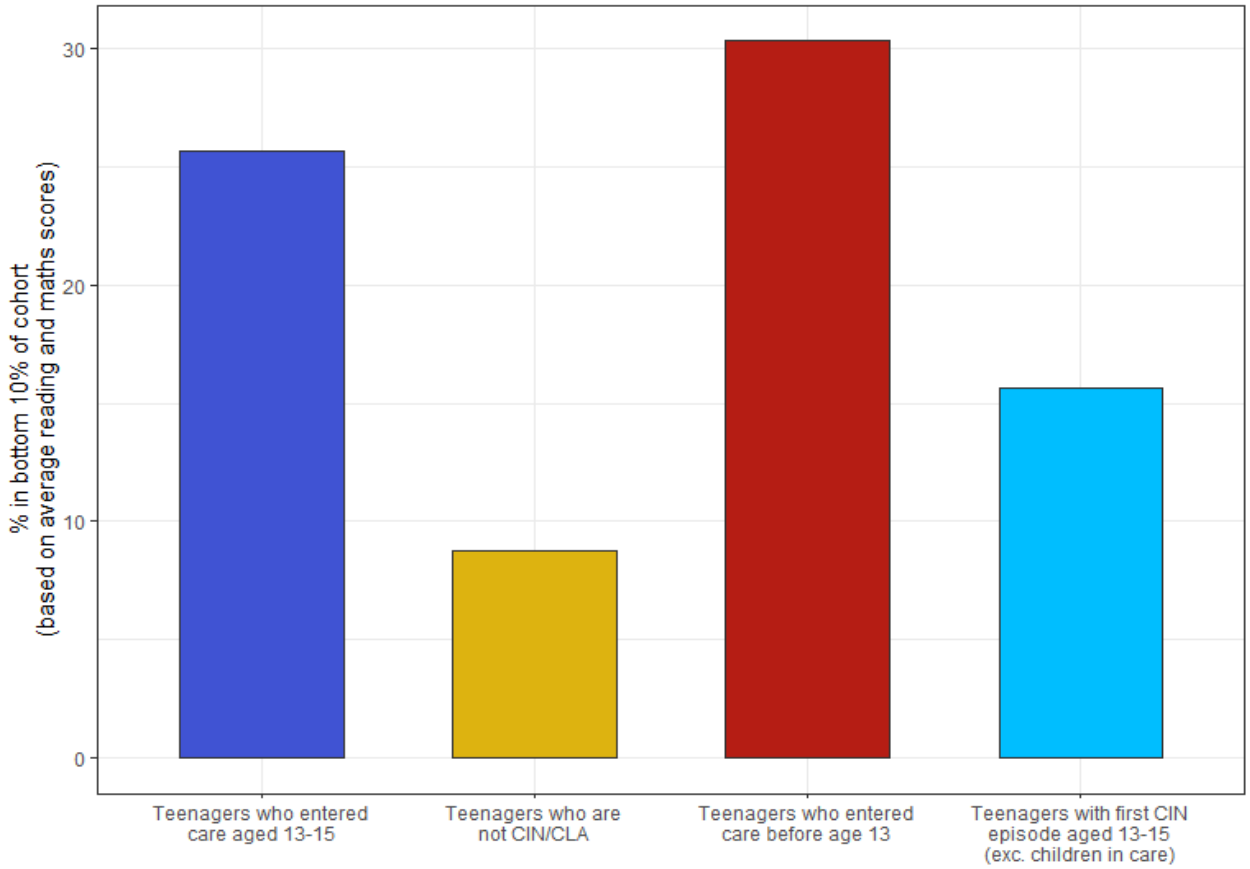


Attainment

While there may not be a direct causal link from a child's educational attainment to their need for social care intervention, a common underlying factor (e.g. SEN, as shown earlier) may affect both, meaning that low prior attainment could be an upstream indicator of a child needing early help. This section shows the levels of attainment at Key Stage 2 (KS2), Key Stage 1 (KS1) and EYFS for each of the children in the groups in this sample.

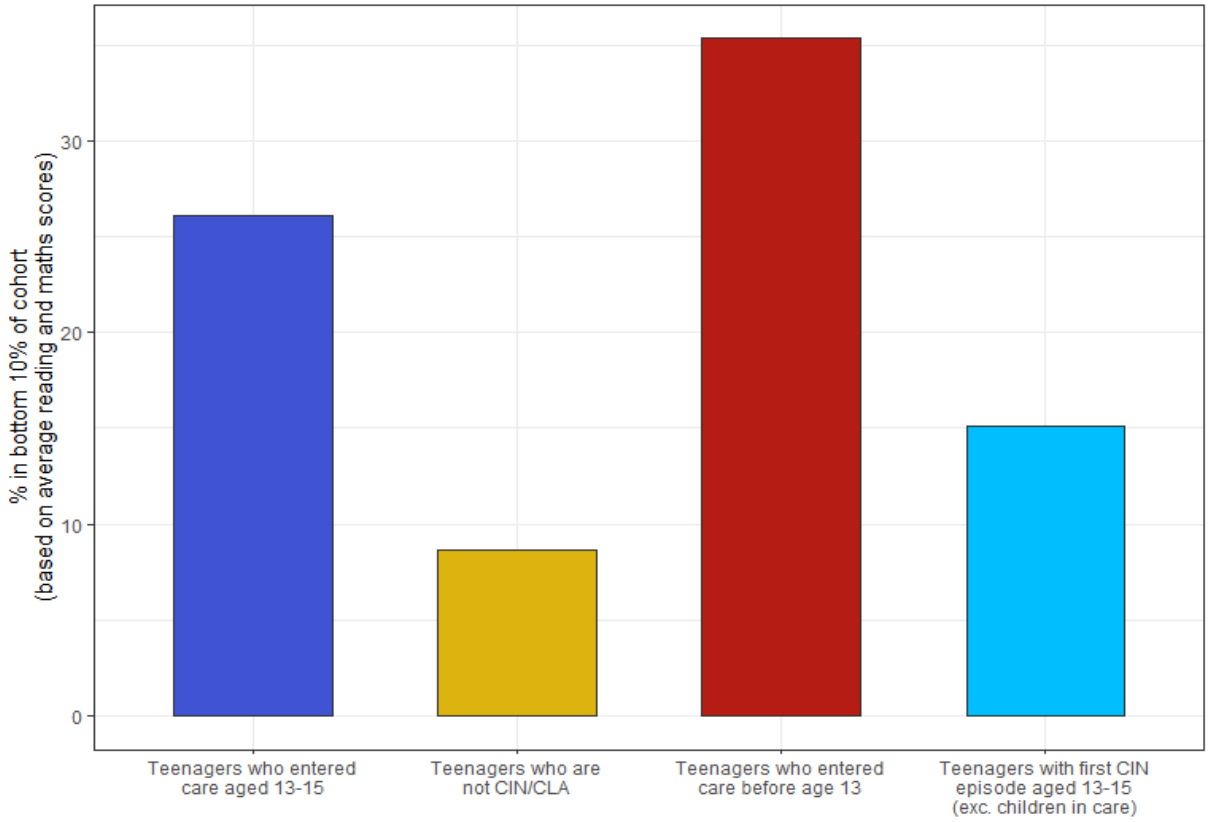
Figure 20 below shows the proportion of children in each group who were in the bottom 10% of their age group based on average KS2 maths and reading point scores. The sample of children who enter care as teenagers are over twice as likely as the wider population of children to be in the bottom 10% of their cohort on this measures, but slightly less likely than children who entered care before they were teenagers.

Figure 20: Rates of children in the bottom 10% of age group based on average of KS2 reading and maths scores



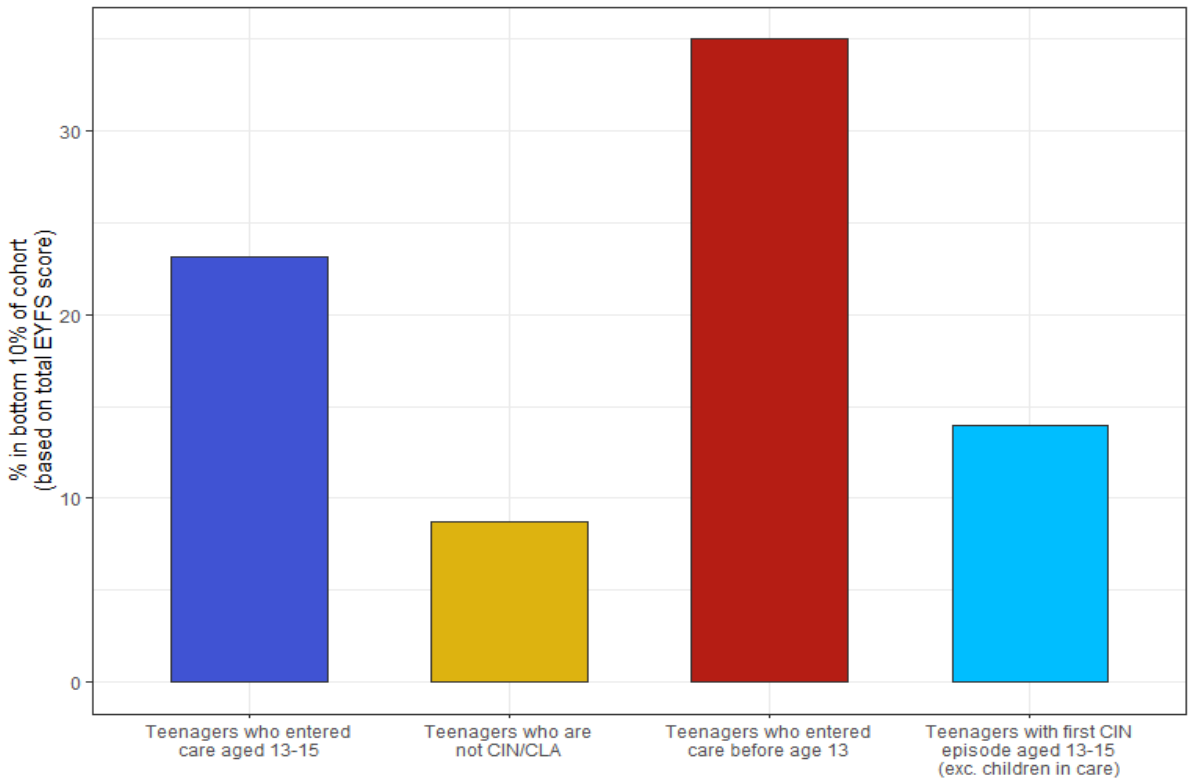
Figures 22 and 23 show the same breakdowns as above but for Key Stage 1 and demonstrates broadly similar patterns to attainment at key stage 2.

Figure 20: Rates of children in the bottom 10% of age group based on average of KS1 reading and maths scores



The earliest standardised indicator of development and attainment is the Early Years Foundation Stage (EYFS) profile, which combines early indicators to give a point score. Figure 24 shows that the picture even at this very early stage is similar to at key stage 1 and 2.

Figure 22: Rates of children in the bottom 10% of age group based total EYFS scores



How well can we predict from education and children's services data which children will get their first social care intervention as teenagers?

Approach

This section examines how well we can differentiate between children that will have their first children's services intervention as teenagers (either being taken into care or starting a CIN or CPP plan - hereafter our late intervention group) from children with no social care contact aged 13-15. Note: we exclude from our models children who are in contact with children's services as teenagers but who entered care/started their time on a CIN plan prior to the age of 13.

We include the following factors in our models listed in the table below, incorporating school and children's services referral information. Note: We include variables for whether children have each characteristic for each year of age up to and including the model's respective upper age limit. For example the model at age 8 includes any identified SEN at ages 6, 7 and 8 included as separate variables. This allows interactions between these ages to be incorporated in the modelling.

Table 5: Variables included in predictive models

		Age 8	Age 10	Age 12
Free school meals	FSM eligible during year	✓	✓	✓
Attainment	EYFs percentile rank (score 1-100)	✓	✓	✓
	KS2 percentile rank (scored 1-100 based on average of maths and reading points scores)			✓
	KS1 percentile rank (scored 1-100 based on average of maths and reading points scores)	✓	✓	✓
Time out of school/in alternative provision	Enrolled in PRU during year	✓	✓	✓
	Mid-year school move during year	✓	✓	✓
	Missed at least one school census during year	✓	✓	✓
Children services referrals	Any CIN referral during year		✓	✓
Exclusions	Any permanent exclusion during year	✓	✓	✓
	Any fixed term exclusion during year	✓	✓	✓
SEN	Statement/EHC plan during year	✓	✓	✓
	SEN support but no statement/EHC plan during year	✓	✓	✓
	Any identified SEMH during year	✓	✓	✓
	Any identified speech & language needs during year	✓	✓	✓
Absence	% sessions absent during the year	✓	✓	✓
	% sessions unauthorised absent during the year	✓	✓	✓

At each age we estimate two separate models (resulting in six models in total). The first model at each age attempts to separate those who will receive their first children's services intervention of any sort as

teenagers (approximately 3% of our sample) from other children. The second model attempts to separate those that will be taken into care for the first time as teenagers (less than 1% of our sample) from other children.

To fit these models we optimise a series of gradient boosted decision trees (fit via the 'xgboost' algorithm - see Chen 2016). These are an extension of the traditional decision tree models, maintaining the inherent advantage of tree based approaches in incorporating non-linear combinations of variables in our models. However these models also help to mitigate decision trees' tendency to overfit training data through combining the results of multiple decision trees into one model through a process known as 'boosting'.

This works by fitting an initial decision tree to the data then examining results that are poorly classified by this first tree. It then fits subsequent trees to this hard to these hard to classify data points up to a pre-specified maximum. Predicted probabilities for an individual data point are weighted averages of these decision trees. The number of trees grown for each model is varied and (along with the maximum depth and minimum node size) are tuned via 5 fold cross validation on an 80% training set sample.

We decide on this best fitting set of parameters through predicting a probability of being in each of our late intervention groups and calculating the overall area under the precision recall curve (PRAUC) for each model. This curve gives an idea of how the related measures of:

- precision (the proportion of those predicted as being in our late intervention group that in reality did go on to get children's services intervention as teenagers)

- recall (the proportion of those who did get children's services intervention as teenagers that are correctly classified by our model)

vary as the threshold for predicting a child as being in our late intervention group is varied. A higher score on this PRAUC measure indicates a better performing model with 1 representing a perfect classifier and the mean intervention class probability as its lower bound. This is preferable to other classification measures (such as overall accuracy) that will be inflated and misleading due to the large class imbalance in this data. The best fitting combination of parameters are then fit to the full dataset and used to predict probabilities on the remaining 20% test set.

Alongside presenting this PRAUC measure we also find an optimal classification threshold for our best fitting mode at age 8 based on the probability threshold that maximises our model's 'F1' score (a weighted average of precision and recall at a given probability threshold). To make recall values more comparable across ages we then apply this threshold to our predicted probabilities at age 10 and 12[9]. We also present plots demonstrating which factors (and at which ages) contribute most to our models' predictive performance. We do this through examining the importance of each of the included predictors in each model and rank these based on the proportion of our model's performance that is attributable to each of the factors included. This is useful as a measure as it takes into account the contributions that each factor even when it is part of an interaction with another factor.

To explore which factors are important predictors further and to give insight into particular groups that are most at risk, we also undertake a related but separate piece of modelling on this data. Here we fit a simple boosted tree model to our training data (100 iterations with a maximum depth of 2 and at least

[9] Note: these thresholds are picked to aid comparability across ages and demonstrate change between the models. However, it should be borne in mind that there may be a more predictive threshold at each age

50 children in each leaf node) and then include all of the estimated two way interactions as features in a lasso regularized logistic regression model alongside the individual effects of each predictor variable (a process known as the RuleFit algorithm Friedman & Popescu 2005[10]). The coefficients from this optimised regression model can then be ranked in terms of effect size to give an idea of the groups in our data with the highest probabilities of being in our target groups.

Identifying a group in need of any children's services intervention aged 13-15

This section attempts to accurately predict which children will receive their first children's services intervention (either a new CIN episode or entering care) at ages 13-15 from all children not currently in contact with children's services at age 13-15.

Predictive accuracy by age

Table 6 below demonstrates that at age 8, 10 and 12 the best fitting models are notable improvements on a random classifier on both our training and test data. However, this also suggests that there remains a high level of inaccuracy when trying to predict our late intervention group given that our PRAUC scores are all less than 0.04 (a perfect classifier would score 1).

Table 6: overall area under precision recall curve (PRAUC) for models predicting at age 8, 10 and 12 children who have their first CIN episode or spell in care aged 13-15. *Note: a value of 1 would denote a perfect classifier*

Age	Random PRAUC	Training set PRAUC	Test set PRAUC
8	0.014	0.029	0.026
10	0.014	0.032	0.028
12	0.014	0.035	0.032

Table 7 demonstrates that (when the classification threshold is held constant at 0.03) recall and precision values increase from 16% and 3% respectively at age 8 to 22% and 4% at age 12.

However, both are low suggesting that even at age 12 around 4 in 5 of children that enter care or have their first CIN episode aged 13-15 are not correctly predicted by this model.

Table 7: overall precision and recall statistics for models predicting at age 8, 10 and 12 children who have their first CIN episode or spell in care aged 13-15

Age	Training set precision (%)	Test set precision (%)	Training set recall (%)	Test set recall (%)
8	3.7	3.4	17.2	15.7
10	3.9	3.7	21.4	20.3
12	4.3	4.1	23.0	22.0

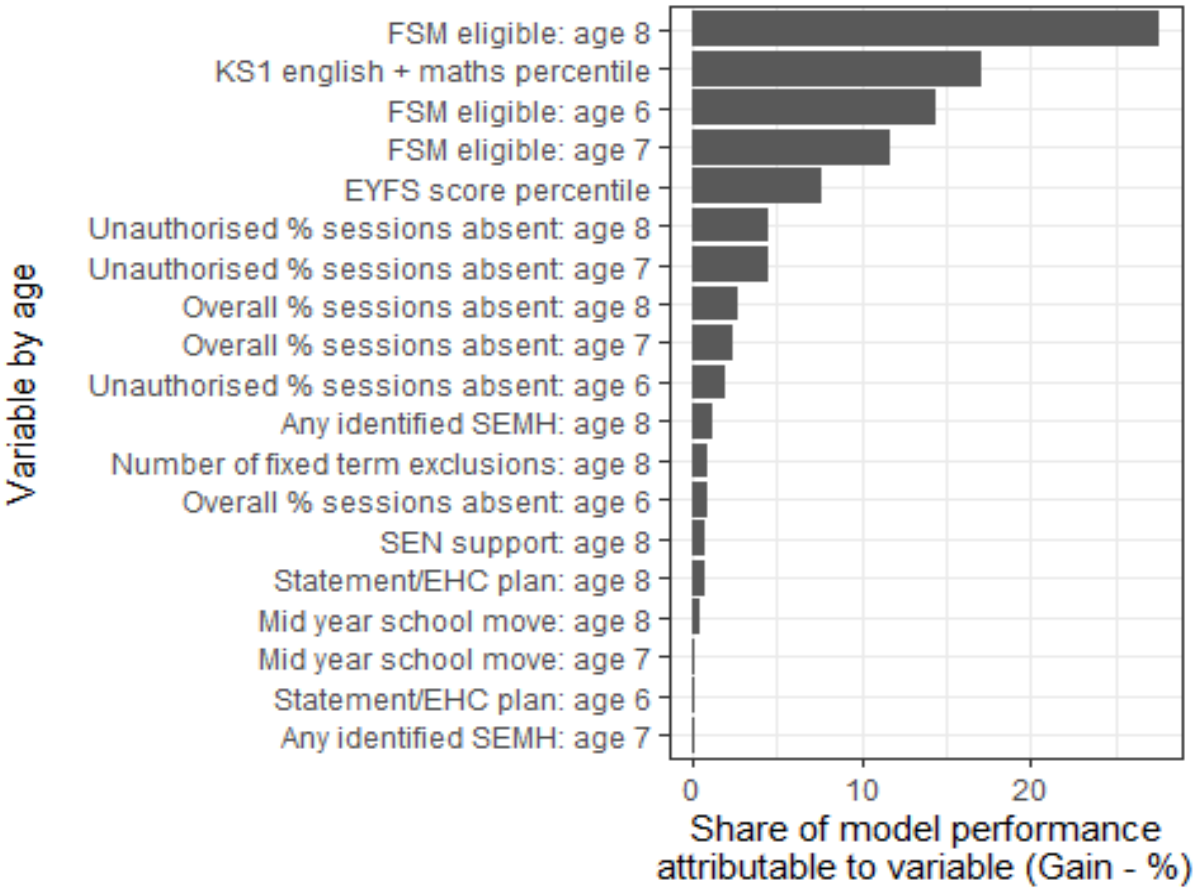
[10] implemented via the xrf package in R Holub 2020

Key predictors at each age

Age 8

Figure 25 below demonstrates that, at age 8, indicators of whether a child is FSM eligible contribute the most to separating our late intervention group from other children, accounting for almost 30% of model performance. Key stage 1 attainment also score highly on this measure though this should be viewed with caution given the greater number of possible splits possible on a continuous variable.

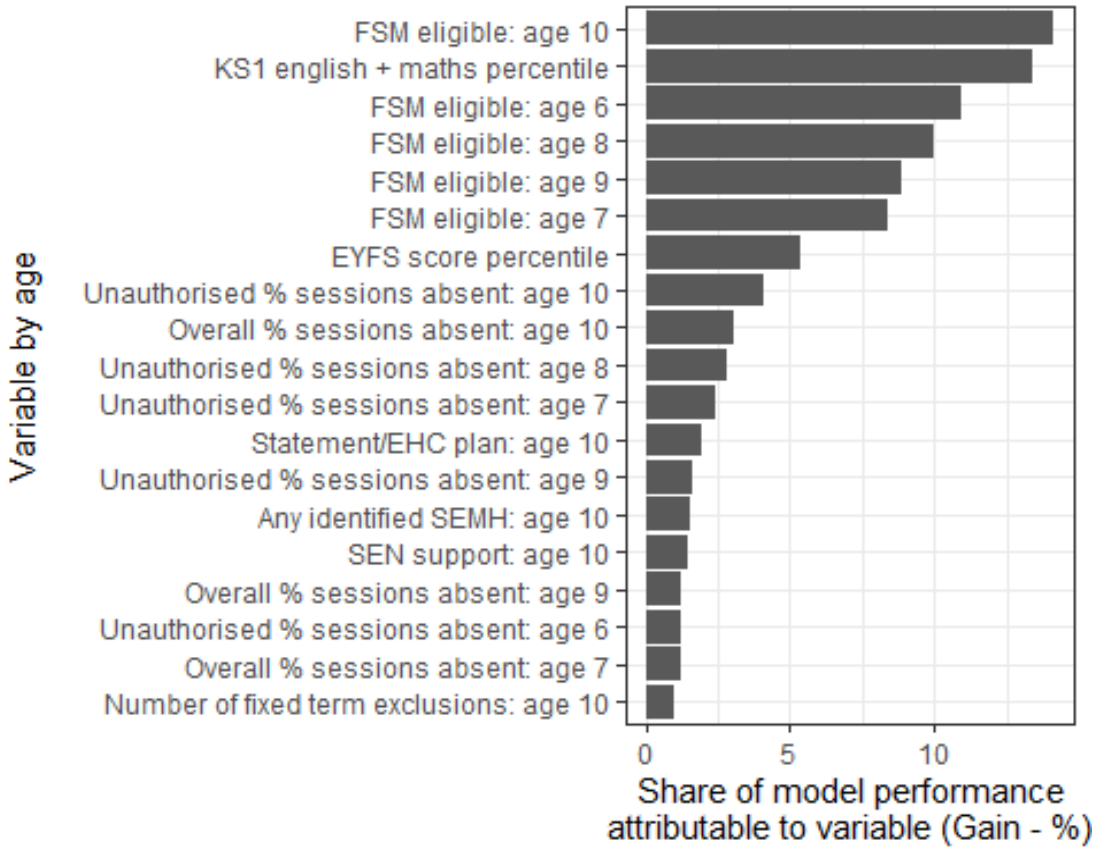
Figure 25: Variable importance scores for factors included at age 8. Outcome - children receiving their first children's services intervention aged 13-15



Age 10

Figure 26 demonstrates that at age 10 similar factors rank highest in terms of variable importance as at age 8.

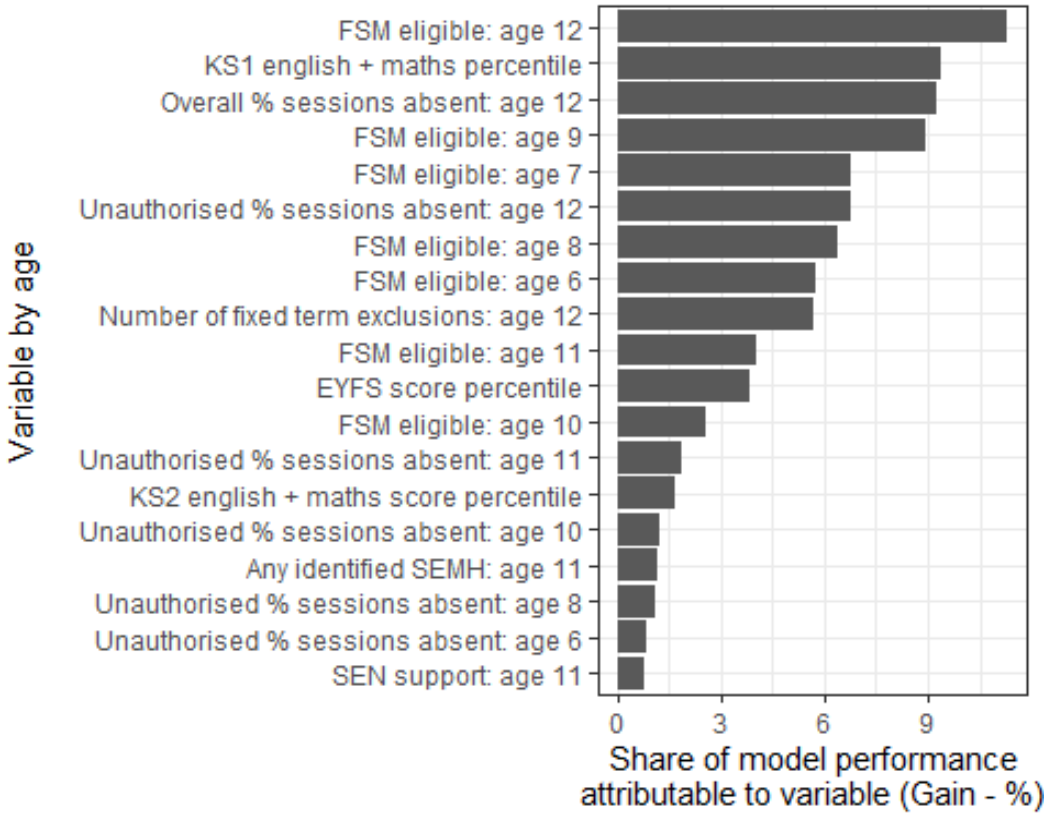
Figure 26: Variable importance scores for factors included at age 10. Outcome - children receiving their first children's services intervention aged 13-15



Age 12

Figure 27 below demonstrates that at age 12 FSM eligibility, attainment at KS1 and absence and exclusions play the largest roles in prediction.

Figure 27: Variable importance scores for factors included at age 12. Outcome - children receiving their first children's services intervention aged 13-15



Regression results: Groups with high likelihoods of getting their first children's services intervention aged 13-15

Age 8

Table 8 demonstrates that there are comparatively few groups with significantly increased odds of being in this late intervention group once all interactions and main effects are taken into account. The exceptions are those related to FSM eligibility and low attainment at Key stage 1 or unauthorised absence, though the size of these effects are small.

Table 8: Groups with the highest association at age 8 with children having their first CIN episode or spell in care aged 13-15

Interaction	Odds ratio
Any FSM age 8	1.10
Any FSM age 7 & Below 21st percentile on average KS1 scores	1.04
Any FSM age 6 & Below 56th percentile on average KS1 scores	1.01
Any FSM age 8 & unauthorised absence > 0.06% of possible sessions at age 8	1.01

Age 10

Table 9 demonstrates there are more interactions that are positively associated with being in our late intervention group at age 10. Again clearly free school meals eligibility plays a key role in these, though there are also greater roles for fixed term exclusions and identified SEMH at age 10.

Table 9: two way interactions with the highest association at age 10 with children having their first CIN episode or spell in care aged 13-15

Interaction	Odds ratio
Any fixed term exclusions age 10 & Below 74th percentile in KS1 scores	1.21
Any FSM age 10	1.14
Any FSM age 8	1.12
No CIN referrals age 8 & Any FSM age 9	1.12
Any identified SEMH age 10 & unauthorised absence age 8 below 0.03% of sessions	1.02
Any FSM age 10 & Unauthorised absence aged 10 above 1.6% of sessions	1.01
Any identified SEMH age 10	1.01

Age 12

Table 10 (below) demonstrates that notably more groups are identifiable at age 12. Particularly prominent are indicators related to loss of contact with education such as children with fixed term exclusions and school absence. Identified SEN is also prominent in these interactions at a variety of ages.

Table 10: two way interactions with the highest association at age 12 with children having their first CIN episode or spell in care aged 13-15

Interaction	Odds ratio
Overall absence less than 3% of possible sessions aged 8 & Any fixed term exclusions aged 12	1.32
2+ fixed term exclusions aged 12 & less than 1% of sessions missed due to unauthorised absence aged 6	1.31
No SEN support aged 11 & 2+ fixed term exclusions aged 12	1.29
Any statement/EHC plan aged 6 and in the bottom percentile of EYFS scores	1.23
Identified SEMH age 9 & No FSM aged 8	1.16
Any FSM aged 11 & Any fixed term exclusions aged 12	1.15
Overall absence aged 12 > 5% & Any fixed term exclusions aged 12	1.11
No FSM aged 7 & Any statement/EHC plan aged 12	1.11
Overall absence greater than 9% of possible sessions aged 12 & less than 0.3% of sessions missed due to unauthorised absence aged 12	1.11

Identifying a group who become looked after for the first time aged 13-15

This section focuses specifically on predicting children who enter care for the first time aged 13-15, from children who have no children's services contact aged 13-15 or those having their first CIN episode aged 13-15.

Results by age

Table 11 below demonstrates that predicting the very small proportion of children that will enter care for the first time as teenagers based on education data and previous children's services referrals alone is challenging. While overall model fit scores are notable improvements on a random classifier, PRAUC values are only in the region of 0.01 - 0.03 across the samples used. This suggests there is a large degree of misclassification of these children at all 3 ages.

Table 11: overall area under precision recall curve (PRAUC) for models predicting at age 8, 10 and 12 children who have their first entry into care aged 13-15. *Note: a value of 1 would denote a perfect classifier*

Age	Random PRAUC	Training set PRAUC	Test set PRAUC
8	0.002	0.012	0.008
10	0.002	0.021	0.011
12	0.002	0.033	0.020

This is confirmed by Table 12 which demonstrates that both measures of precision and recall are low at all 3 ages. As with results for our wider late intervention group, (when the classification threshold is held constant across ages) we correctly identify around 5% of our target group at age 8, rising to around 20% at age 12.

Table 12: overall precision and recall statistics for models predicting at age 8, 10 and 12 children who have their entry into care aged 13-15

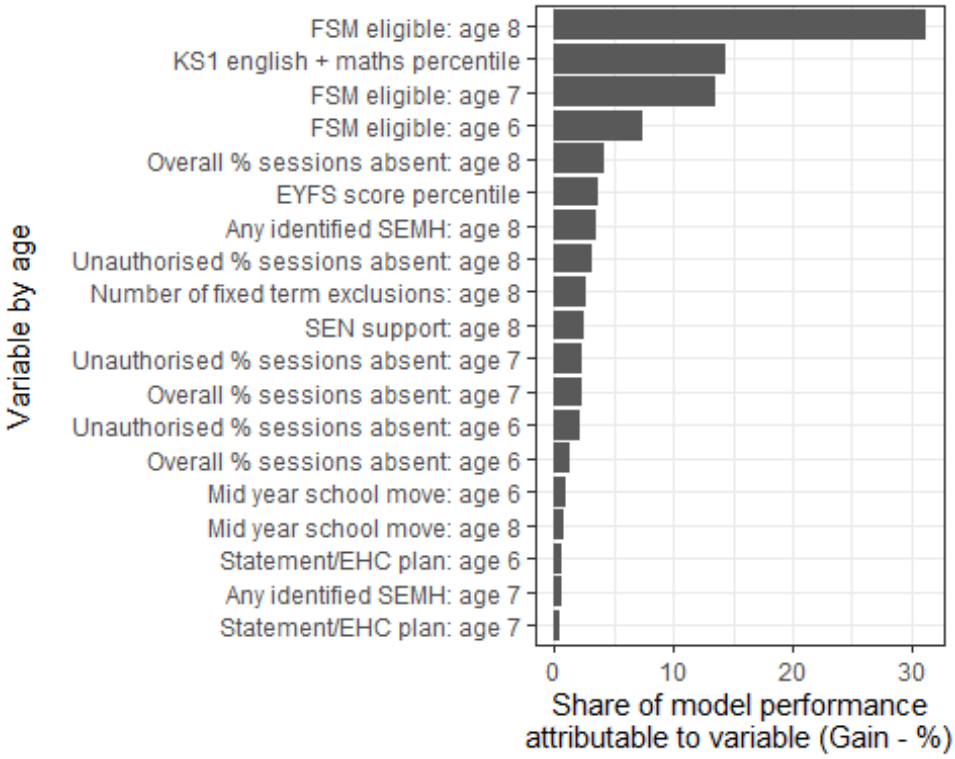
Age	Training set precision	Test set precision	Training set recall	Test set recall
8	2.8	2.0	7.6	5.1
10	3.1	2.1	18.5	12.3
12	4.1	3.3	23.1	18.5

Key predictors

Age 8

Figure 28 demonstrates that key predictors at age 8 are particularly whether a child is eligible for free school meals at ages 6, 7 and 8, their performance at key stage 1 and whether they have social emotional and mental health issues identified as a primary SEN type. Children being eligible for FSM at age 8 accounts for 30% of the predictive power of this model (including as part of interactions) at age 8 and is notably higher than other factors included in the model.

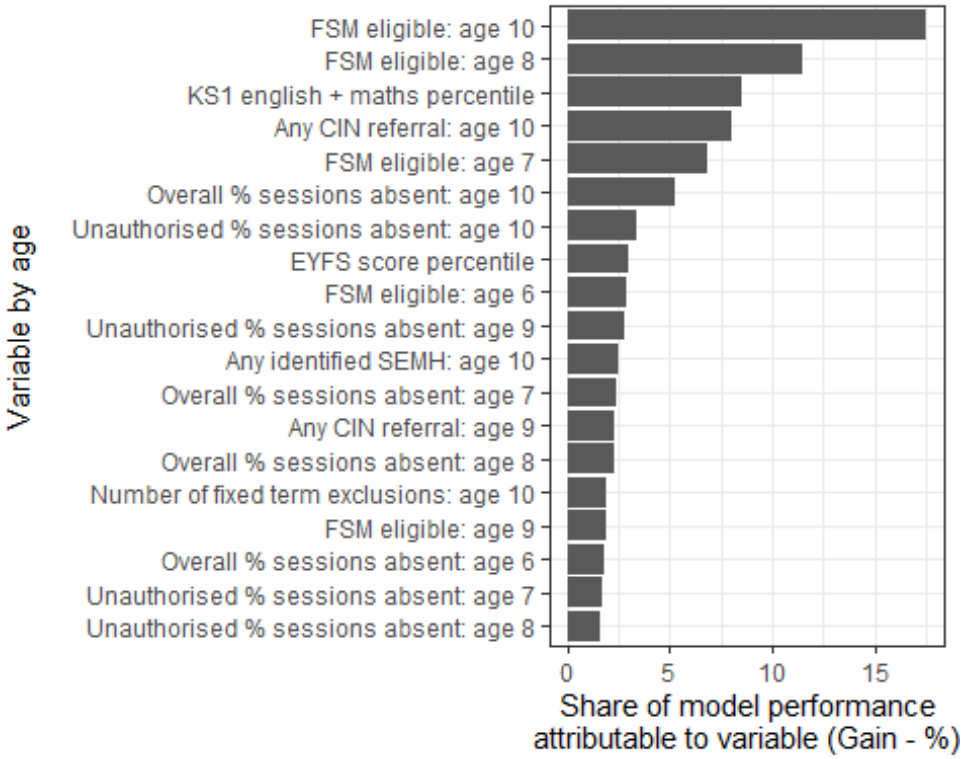
Figure 28: Variable importance scores for factors included at age 8. Outcome - children becoming looked after for the first time aged 13-15



Age 10

Figure 29 demonstrates that key predictors at age 10 are similar to those at age 8, but also include children with CIN referrals and those who are absent from school. However again FSM eligibility in the most recent year accounts for the largest share of our model's predictive power at just under 20% of total predictive gain from the model.

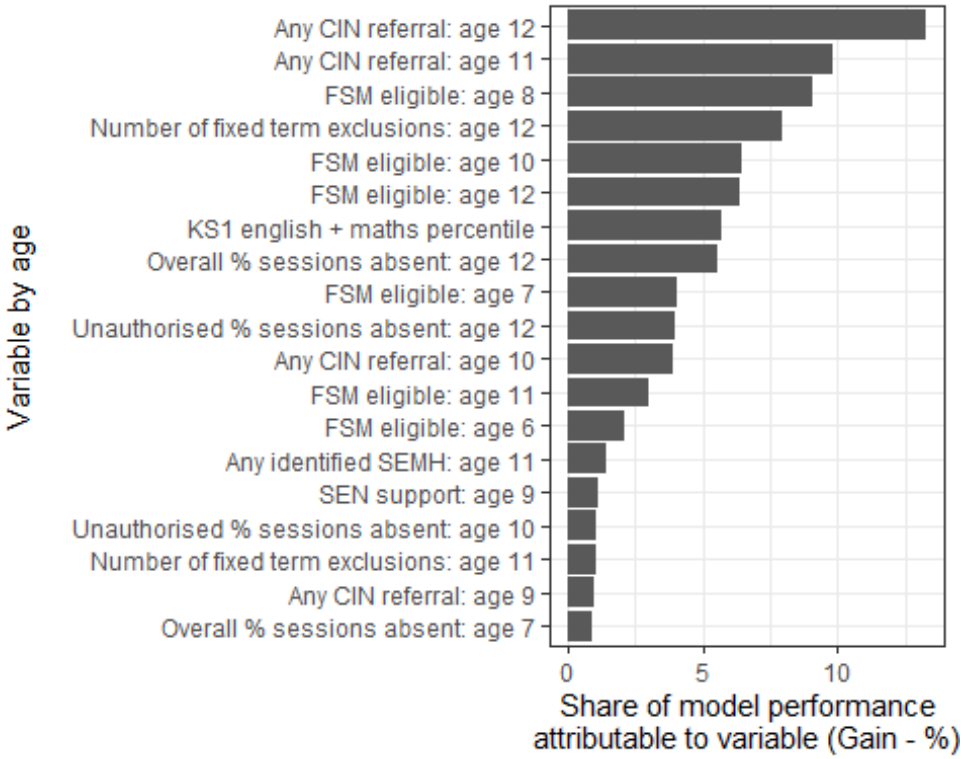
Figure 29: Variable importance scores for factors included at age 10. Outcome - children becoming looked after for the first time aged 13-15



Age 12

Figure 30 demonstrates that a greater ranger of factors are contributing to predictions at age 12, though key predictors remain FSM eligibility and CIN referrals during recent years. Notably though factors relating to loss of contact with education also have high importance values at this age including numbers of fixed term exclusions.

Figure 30: Variable importance scores for factors included at age 12. Outcome - children becoming looked after for the first time aged 13-15



Regression results: Groups with higher likelihoods of becoming looked after for the first time aged 13-15

Age 8

Table 13 below demonstrates that key interactions relate to children who are free school meals eligible and these interacted with other vulnerabilities. This is particularly around children with low attainment at Key Stage 1, those with high levels of unauthorised absence and those with identified low level SEN.

Table 13: two way interactions with the highest association at age 8 with children having their first entry into care aged 13-15

Interaction	Odds ratio
Any FSM age 8	1.90
Any FSM age 6 & Below 28th percentile in average KS1 scores	1.28
Any FSM age 7	1.22
Any FSM age 7 & Below 13th percentile in average KS1 scores	1.19
Any FSM age 8 & Missing more than 4.5% of sessions due to unauthorised absence aged 8	1.18
Any FSM age 7 & SEN support age 8	1.16

Age 10

There is a similar pattern of interactions at age 10 as at age 8 (Table 14). There are recurrent interactions between children being free school meals eligible and other vulnerabilities. However, indicators of children losing contact with education are also key at this age, particularly high levels of unauthorised absence and any fixed term exclusions at age 10.

Table 14: two way interactions with the highest association at age 10 with children having their first entry into care aged 13-15

Interaction	Odds ratio
Any FSM aged 10 & Missing more than 20% of sessions due to unauthorised absence aged 10	2.76
Any FSM aged 8 & any CIN referrals aged 9	1.74
Any FSM aged 10 & Any fixed term exclusions aged 10	1.68
Any FSM aged 8 & Missing more than 4.5% of sessions due to unauthorised absence aged 8	1.23
Any FSM aged 10 & overall absence greater than 9% of possible sessions aged 10	1.21
Any FSM aged 6 & any mid-year school moves aged 9	1.19
Any FSM aged 7 & Below 13th percentile on KS1 scores	1.18
Any FSM aged 7 & Any SEN support aged 10	1.16
Any CIN referrals aged 10 & Overall absence less than 5% of possible sessions aged 6	1.14

Age 12

There is a slight shift in the pattern of key interactions at age 12 (Table 15). Key interactions tend to focus on children with referrals to children's services in combination with other vulnerabilities, combined with other vulnerabilities. These are particularly around indicators of losing contact with education and identified SEN.

Table 15: two way interactions with the highest association at age 12 with children having their first entry into care aged 13-15

Interaction	Odds ratio
Any CIN referrals aged 12 & 3+ fixed term exclusions aged 12	1.69
Any fixed term exclusions aged 11 & missing less than 3% of sessions due to unauthorised absence aged 10	1.37
Any CIN referrals aged 9 & any FSM aged 7	1.34
Any CIN referrals aged 12 & any identified SEMH aged 11	1.28
Any CIN referrals aged 10 & overall absence less than 5% of possible sessions aged 6	1.17
Any CIN referrals aged 11 & Below the 50th percentile on KS2 scores	1.16
Any CIN referrals aged 12 & any FSM aged 9	1.15
Any fixed term exclusions aged 12 & missing more than 0.3% of sessions due to unauthorised absence aged 12	1.10
Any FSM aged 6 & any mid-year school moves aged 9	1.08

Discussion

This research represents some exploratory steps in attempting to predict the types of children that are more likely to enter the care system later in life. This is an important group to consider due to the complexity of need amongst this group as well as the financial and resource implications for local authorities. However, this research suggests that though there are some useful predictors available in school data and children's services referrals, accurately differentiating those who will need a children's services intervention aged 13-15 from those who will not is difficult based on this data alone. While the models presented above are a notable improvement on random classifiers, it is unclear if the performance above adds much on top of what a social worker or other professional working with children would be able to correctly identify. This would be a useful test for these models in future work.

There are some key limitations to this work that it may also be useful to address:

1. The range of data available on these children is limited to variables collected by schools and children's services and submitted centrally. Lacking is any data around parental needs or conflict, information from mental health services, incidents of police contacts/criminal justice involvement, exploitation, or information on material deprivation and severe poverty. These factors will likely be key drivers of why children are coming into contact with social services in adolescence.
2. The variables that are available are often quite broad measures of need and struggle to mark out the small numbers of children and families with the most complex needs. Free school meals eligibility is a good example of this and emerges from the above research as one of the stronger predictors. However, this is likely acting as a proxy measure for other unmeasured aspects of need related to deprivation and makes no differentiation between those in severe poverty or those in less severe need and as such captures a very broad set of children when used as a predictor. Identified SEN is another good example whereby needs like SEMH can encompass a wide variety of needs amongst children. For both this and point 1 above, it may be that acquiring this wider data is more feasible in a particular local area (or set of areas) where data sharing agreements between relevant agencies are already in place and where more detailed measures of need can be obtained from case management systems.
3. The children coming into contact with children's services aged 13-15, and especially those entering care for the first time at this age, make up very small proportions of the cohort analysed. It is instructive that in virtually all specifications run, quite shallow trees emerge as performing best after cross validation. More complex models tend to overfit severely on the training data suggesting there may be a very large number of different pathways and combinations of needs that result in a child entering care in adolescence and that training a set of rules that effectively generalise to other samples may be difficult without much larger numbers of cases to learn from. It may be useful to explore this approach across cohorts as an attempt to boost numbers in the target prediction group.
4. This outcome for this analysis is whether children receive an intensive social care intervention. The receipt of that intervention may depend on a range of factors beyond the child's needs, including local thresholds and the nature of frontline social work practice in a particular area. Children who receive this intervention are likely to also be a subset of those with needs that may benefit from that intervention. Therefore it may be that some of the inaccuracy in these models is due to children being judged to not meet social care thresholds or being diverted to other services in LAs.

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