



Department  
for Education

# **The link between absence and attainment at KS2 and KS4**

**2013/14 academic year**

**Research report**

**March 2016**

# Contents

1. Introduction	3
2. Key findings	4
3. Methods	5
3.1 Source of data	5
3.2 Cohort	5
3.3 Controlling for other known pupil characteristics	6
3.4 What is included alongside the main report	9
4. Results	11
4.1 Introduction	11
4.2 The link between absence and attainment at key stage 2	11
4.3 The link between absence and attainment at key stage 4	15
4.4 Assessing the impact of absence on attainment after controlling for other factors	18
5. Conclusions	22
Annex A: Technical notes	23
Annex B: Model output	28

## 1. Introduction

This report investigates the link between different levels of absence and attainment for pupils at the end of key stage 2 (KS2) and key stage 4 (KS4) in state-funded mainstream schools. It covers overall absence, as well as absence for different authorised and unauthorised reasons. The main analysis focuses on 2013/14 attainment; however time series information is also published in the accompanying data tables.

Absence from school is not the only factor that is likely to affect a pupil's level of attainment. There are a range of pupil, school, parental and societal characteristics that are likely to affect attainment in varying degrees. To better understand the link between absence and attainment, a model was developed to take observed factors into account, such as prior attainment and different pupil characteristics.

This report updates the figures from previous research that were published in February 2015, [Absence and attainment at key stages 2 and 4: 2012 to 2013](#). The February report gave a high level overview of the link between pupil absence and attainment by simply looking at the effect of increased levels of overall absence; the analysis did not control for other factors or look at different types of absence.

The additional detailed information in this report, on reasons for absence and the relative impact of absence on attainment compared to other factors, were last investigated within [A profile of pupil absence in England](#), published by the Department in November 2011.

## 2. Key findings

At a high level, the key findings for 2013/14 in this report are aligned with the key findings for 2012/13 (and earlier years) that were published in February's report – as overall absence levels increase the average percentage of pupils achieving different levels of attainment at the end of KS2 and KS4 decreases.

The analysis of the link between overall absence (and individual reasons for absence) and attainment when taking prior attainment and pupil characteristics into account showed that, for each KS2 and KS4 measure, overall absence had a statistically significant negative link to attainment – i.e. every extra day missed was associated with a lower attainment outcome. Extending this to look at individual reasons for absence did not add a greater understanding of the link between absence and attainment.

## 3. Methods

Methods used within this report are summarised below. Technical notes providing further definitions and detail are available in Annex A.

### 3.1 Source of data

Parents of children of compulsory school age (aged between 5 and 15 at the start of the academic year) are, by law, required to ensure that their children receive a suitable education through regular attendance at school or otherwise. The Department for Education collects each pupil enrolment's<sup>1</sup> overall sessions missed and number of possible sessions available to them, where a session is equivalent to half a day of school.

The pupil absence and attainment data used in this release have been created by matching absence data, as collected via the school census, to KS2 and KS4 attainment results collected from awarding bodies.

The absence data collected via the school census is as reported by the individual schools and therefore the data provider (i.e. the individual schools) are responsible for ensuring the accuracy of the data returned. At the point of submission to the department, the data collected is deemed to have been checked and signed off by the school head teacher. The data collected from local authority maintained schools also undergoes further approval by the responsible local authority before use by the Department.

Absence data is then matched into the National Pupil Database (NPD) – a longitudinal database which holds a wide range of pupil level data for schools across England. Note that as with any matching exercise there is an accepted margin of error and some mismatches may occur.

Further information on the data matching involved is available in technical note 3.

### 3.2 Cohort

The analysis looks at the attainment of pupils at the end of KS2 and KS4 and the absence each pupil accrued across the whole key stage. Absence information is collected at enrolment level; however, for the purposes of this analysis it has been aggregated to pupil level by summing absence and possible session information across enrolments.

The cohort used in the analysis has been restricted to only include pupils with valid absence and attainment data. The pupils are only those who had close to a full year's worth of possible sessions in each academic year that makes up the key stage.

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<sup>1</sup> Pupil absence information is collected at pupil enrolment level rather than pupil level. Where a pupil has moved school during the year, they will be counted more than once as they have recorded absence data in more than one school. Where a pupil has a dual registration their absence may be returned from both schools, if both schools return absence data via the school census.

Restricting the cohort in this way ensured that pupils with high values of possible sessions (which were likely to be incorrect) or those with extremely low numbers of possible sessions (for whom we would not be able to determine a full picture of the link between their absence and attainment) were removed and did not distort the findings.

Details of the numbers of pupils removed prior to analysis are set out in the table below.

Table 1: Number of end KS2 and end KS4 pupils in state-funded mainstream schools removed from the 2013/14 analysis using attainment and possible session filters

	KS2 pupils	KS4 pupils
	Number of pupils	Number of pupils
<b>All pupils with absence and attainment data</b>	<b>561,967</b>	<b>628,572</b>
Pupils remaining after applying attainment filter <sup>2</sup>	548,299	548,220
Pupils remaining after applying possible session filter <sup>3</sup>	482,244	503,777

### 3.3 Controlling for other known pupil characteristics

In this report a logistic regression model predicts the probability of achieving KS2 and KS4 indicators for each pupil and identifies the set of statistically significant variables that are related to attainment.

It models the logarithm of odds of achieving KS2/KS4 indicators (Y) as a linear function of explanatory variables:

$$\log(\text{odds}(Y)) = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_mx_m$$

The odds of achieving are then identified by taking an exponential:

$$\text{odds} = e^{\beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_mx_m}$$

Each KS2 and KS4 indicator has been modelled twice:

- First to assess the effect of overall absence on attainment when taking into account prior attainment and other pupil characteristics.
- Second to assess the effect of individual reasons for absence on attainment when taking into account prior attainment and other pupil characteristics. This model aimed to test whether the explanatory power of the model increases by including the different absence types.

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<sup>2</sup> Filtered to include pupils at the end of KS2/KS4 only, whose exam results were included in the relevant year's Performance Tables for stated school types.

<sup>3</sup> More detail on the methodology used to remove these pupils and some likely reasons as to why pupils may not have a full key stage of reported possible sessions, are included in technical notes 9 and 10.

For relevance and simplicity, the models were run on 2013/14 results only.

The models were assessed by calculating the level of discrimination between the pupils that achieved each KS2 and KS4 indicator and the pupils that did not. The discrimination was evaluated by calculating the Area Under Curve (AUC) for the Receiver Operator Characteristic (ROC) curve, where an area of 1 represents a perfect fit and an area of above 0.8 is a good fit (Hosmer and Lemeshow, 2000, p.162)<sup>4</sup>.

The variables included in the models are as follows:

Variable	Description
Prior attainment <sup>5</sup>	<p>Prior attainment is included in the model as a continuous variable.</p> <p>For KS2, the pupil's KS1 average point score including reading, writing, mathematics and overall science only.</p> <p>For KS4, the pupil's KS2 average point score across qualifying outcomes in English, mathematics and science tests or teacher assessments.</p>
Gender	<p>Gender is included in the model as a categorical variable separating</p> <ul style="list-style-type: none"> <li>- Girls (reference group)</li> <li>- Boys</li> </ul>
Special Educational Need (SEN) <sup>6</sup>	<p>SEN status is derived from the school census and is included in the model as a categorical variable separating</p> <ul style="list-style-type: none"> <li>- No identified SEN (reference group)</li> <li>- School action</li> <li>- School action plus</li> <li>- Statement of SEN</li> </ul>
Ethnic group	<p>Ethnic group is derived from the school census and is included in the model as a categorical variable separating</p> <ul style="list-style-type: none"> <li>• White - British (reference group)</li> <li>• White - Irish</li> <li>• White - Traveller of Irish heritage</li> <li>• White - Any other White</li> <li>• White - Gypsy/ Roma</li> <li>• Mixed - White and Asian</li> <li>• Mixed - White and Black African</li> <li>• Mixed - White and Black Caribbean</li> </ul>

<sup>4</sup> Hosmer, D.W. & Lemeshow, S. (2000) Applied logistic regression, 2nd edn. John Wiley & Sons, New York.

<sup>5</sup> Further information on defining low, medium and high prior attainment can be found [here](#).

<sup>6</sup> Further information on the school census can be found in technical note 1.

Variable	Description
	<ul style="list-style-type: none"> <li>• Mixed - Any other Mixed</li> <li>• Asian - Bangladeshi</li> <li>• Asian - Indian</li> <li>• Asian - Pakistani</li> <li>• Asian - Any other Asian</li> <li>• Black - Black African</li> <li>• Black - Black Caribbean</li> <li>• Black - Any other Black</li> <li>• Chinese - Chinese</li> <li>• Any other ethnic group</li> <li>• Refused</li> <li>• Not obtained</li> </ul>
Free school meal eligibility (FSM)	<p>FSM eligibility is derived from the school census and is included in the model as a categorical variable separating</p> <ul style="list-style-type: none"> <li>• Not eligible for free school meals (reference group)</li> <li>• Eligible for free school meals</li> </ul>
First language	<p>First language is derived from the school census and is included in the model as a categorical variable separating</p> <ul style="list-style-type: none"> <li>• Known or believed to be English (reference group)</li> <li>• Known or believed to be other than English</li> <li>• Unclassified</li> </ul>
Possible sessions	<p>Possible session values are derived from termly school census collections and is equal to the total number of possible sessions across the full key stage. It is included in the model as a continuous variable.</p>
Overall absence – model 1 only	<p>Overall absence is derived from termly school census collections and is the total number of overall absence sessions across the full key stage. It is included in the model as a continuous variable.</p>
Absence broken down by reason – model 2 only	<p>Each absence reason is included in the model as a separate continuous variable. Absence figures are derived from termly school census collections and equal the total number of absence sessions for each reason across the full key stage.</p> <p>Possible reasons for absence which are included in this model are:</p> <p>Authorised reasons:</p> <ul style="list-style-type: none"> <li>• Illness (not medical or dental appointments)</li> <li>• Medical or dental appointments</li> </ul>

Variable	Description
	<ul style="list-style-type: none"> <li>• Religious observance</li> <li>• Study leave</li> <li>• Gypsy, Roma and Traveller absence</li> <li>• Holiday authorised by the school</li> <li>• Excluded but no alternative provision made</li> <li>• Other authorised absences</li> </ul> <p>Unauthorised reasons:</p> <ul style="list-style-type: none"> <li>• Holiday not authorised by the school or in excess of the period determined by the head teacher</li> <li>• Arrived in school after registration closed</li> <li>• Other unauthorised absences</li> <li>• Reason for absence not yet provided</li> </ul>

All model outputs are shown in Annex B.

In this report the model results have been used to quantify the percentage change in odds of achieving each KS2 and KS4 measure following a one unit increase in overall absence. The percentage change is calculated as follows:

$$\text{Percentage change in odds} = (\text{OR} - 1) \times 100$$

Where OR is the relevant odds ratio, calculated as follows:

$$OR = e^{(\text{variable coefficient from model output})}$$

### 3.4 What is included alongside the main report

The report's accompanying data tables show the percentage of pupils achieving each attainment outcome broken down by different absence levels across the relevant key stage. Pupil absence has been broken down and presented in three different ways:

- Percentage of possible sessions missed (overall absence rate)
- Number of weeks / days missed
- Percentiles based upon overall absence rates

To enable more robust comparisons to be made between different groups of pupils, the report's main data tables have been presented in a way that ensures that there is a minimum of 500 pupils in each absence bracket. This means the range of absence brackets presented will vary across different reasons for absence and different measures.

Underlying data is also published alongside the report, providing lower level breakdowns and allowing users to recreate the values presented in the main data tables and conduct their own additional analysis.

The report's annex includes outputs from the modelling carried out to assess the link between absence and attainment when controlling for other factors.

# 4. Results

## 4.1 Introduction

Overall absence rates in state-funded schools have been decreasing over recent years, with the rate of 4.5 per cent in 2013/14 being the lowest level recorded since 2006/07<sup>7</sup>. This decrease has mostly been driven by a reduction in absence due to illness, which accounts for the majority of absence. Absence due to family holidays has also been decreasing. This has been mainly driven by reductions in agreed holiday absence<sup>8</sup> rates. Rates of absence due to agreed family holidays have historically been higher than those for holidays that were not agreed, but for the first time in 2013/14 the order was reversed - with 0.3% of sessions missed due to holidays that were not agreed compared to 0.1% of sessions missed for agreed family holidays.

In this section we first look in turn at the link between absence and attainment at KS2 and KS4 prior to controlling for other factors that are likely to have an influence on a pupil's level of attainment. In section 4.4 we present the results of further analysis, which aims to provide a better understanding of the relationship between absence and attainment by taking individual pupil characteristics, such as prior attainment and pupil characteristics, into account.

## 4.2 The link between absence and attainment at key stage 2

KS2 national curriculum assessments are taken by pupils at the end of primary school education, with this key stage being taught over four years (from year three to year six). By the end of KS2 pupils are expected to reach level 4 of the National Curriculum in each taught subject<sup>9</sup>. In this release, the percentage of pupils at the end of KS2 achieving the key measures of level 4 or above in reading and mathematics tests and level 5 or above in reading and mathematics tests have been considered. See technical note 2 for details of how to find out more information on the way attainment is measured at the end of KS2.

For pupils at the end of KS2, as the level of overall absence increases the proportion of pupils achieving a level 4 or above and a level 5 or above in reading and mathematics tests decreases. This link between overall absence and attainment is evident whether we look at increasing overall absence rates or increasing number of weeks missed.

An alternative presentation, where pupils are grouped equally into percentiles based on their ordered overall absence rates, showed a more gradual, but still downward, trend.

This link between absence and attainment has remained similar over the past six academic years (since 2008/09).

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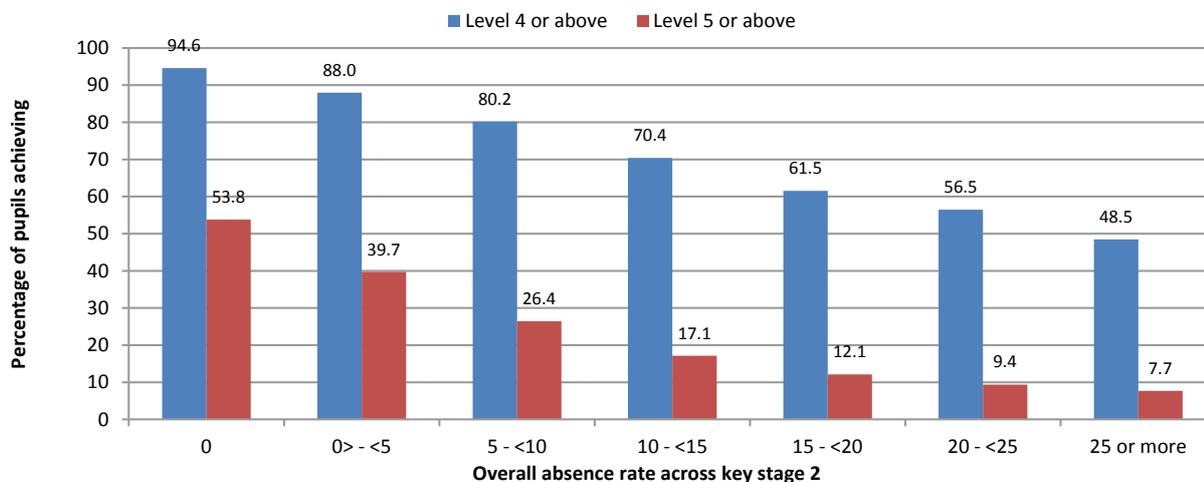
<sup>7</sup> <https://www.gov.uk/government/statistics/pupil-absence-in-schools-in-england-2013-to-2014>

<sup>8</sup> Granted entirely at the head teacher's discretion when they deem that there are exceptional circumstances based on the individual facts and circumstances of the case which warrant the leave

<sup>9</sup> From 2016 KS2 assessments will be based on the new national curriculum. New tests for key stage 1 and key stage 2 will be introduced using scaled scores and national curriculum levels will be abolished.

#### 4.2.1 Percentage point bands based on overall absence rate

Figure 1: Percentage of pupils in state-funded mainstream schools achieving stated levels at the end of KS2 in 2013/14 academic year by overall absence rate across KS2



Overall absence rate across KS2	0	0 > - < 5	5 - < 10	10 - < 15	15 - < 20	20 - < 25	25 or more
Number of pupils	2,150	342,330	110,620	20,735	4,470	1,215	730

Figure 1 shows that pupils with no absence are 1.3 times more likely to achieve level 4 or above, and 3.1 times more likely to achieve level 5 or above, than pupils that missed 10-15 per cent of all sessions.

#### 4.2.2 Number of weeks missed due to overall absence

Figure 2: Percentage of pupils in state-funded mainstream schools achieving stated levels at the end of KS2 in 2013/14 academic year by the number of weeks missed due to overall absence across KS2

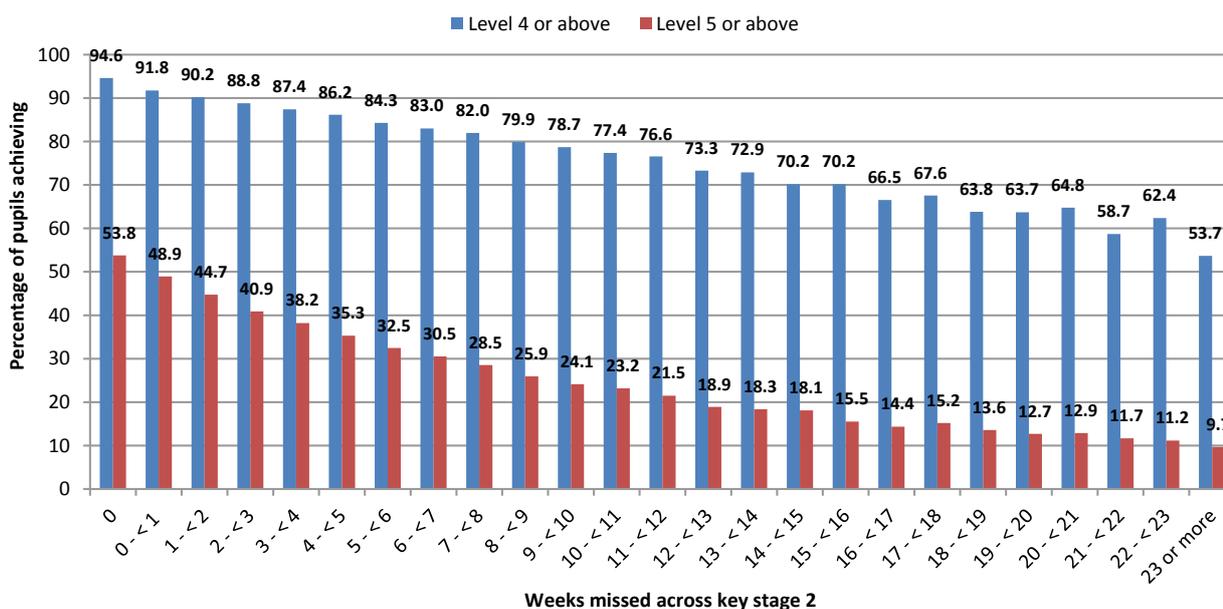


Figure 2 shows that pupils with no absence are 1.1 times more likely to achieve level 4 or above, and 1.4 times more likely to achieve level 5 or above, than pupils missing around one week in each key stage 2 year due to overall absence (this equates to between 3 and 4 weeks across the full key stage).

#### 4.2.3 Percentiles based on overall absence rate

Figure 3 shows KS2 attainment by levels of overall absence split into bands with equal numbers of pupils in each (e.g. so that the first band includes the five per cent of all pupils with the lowest overall absence rates). See technical note 13 for further information on how the data has been grouped into bands in this chart.

Figure 3: Percentage of pupils in state-funded mainstream schools achieving stated levels at the end of KS2 in 2013/14 academic year based on grouping pupils into percentile bands according to their overall absence rate across KS2

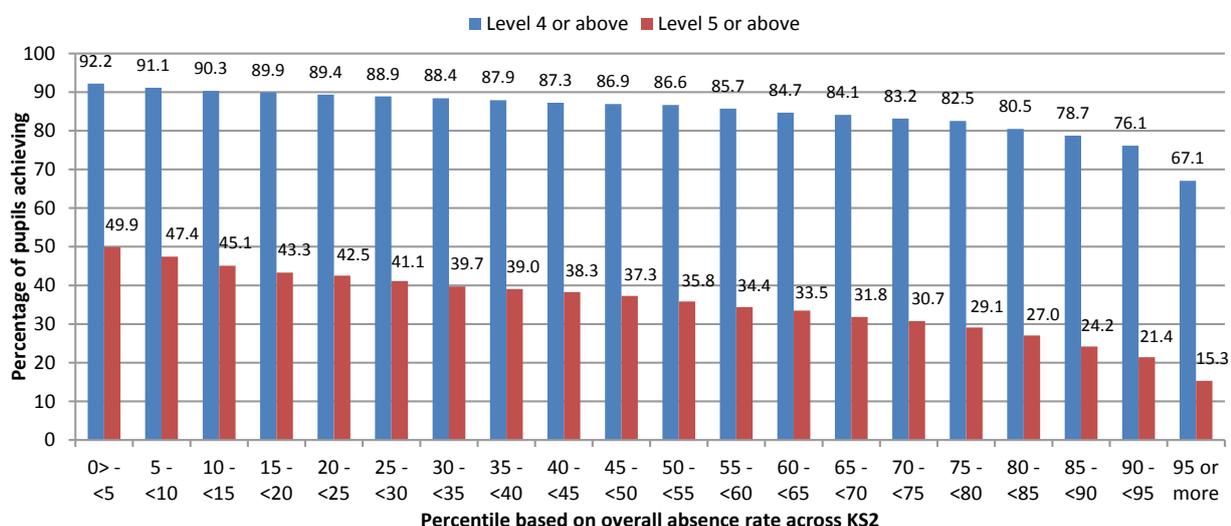


Figure 3 shows that the five per cent of pupils with the lowest overall absence rates (the 0 to 5<sup>th</sup> percentiles) are 1.4 times more likely to achieve level 4 or above in reading and mathematics tests and 3.3 times more likely to achieve level 5 or above in reading and mathematics tests than the five per cent of pupils with the highest overall absence rates (the 95<sup>th</sup> or higher percentiles).

The five per cent of pupils with the lowest overall absence rates are 1.1 times more likely to achieve level 4 or above in reading and mathematics tests and 1.4 times more likely to achieve level 5 or above in reading and mathematics tests than the five per cent of pupils within the 50<sup>th</sup> to 55<sup>th</sup> percentiles.

#### 4.2.4 The link between reason for absence and attainment at key stage 2

The link between levels of total authorised and total unauthorised absence and attainment at the end of KS2 is similar to that of overall absence.

Figure 4: Percentage of pupils in state-funded mainstream schools achieving stated levels at the end of KS2 in 2013/14 academic year by authorised absence rate across KS2

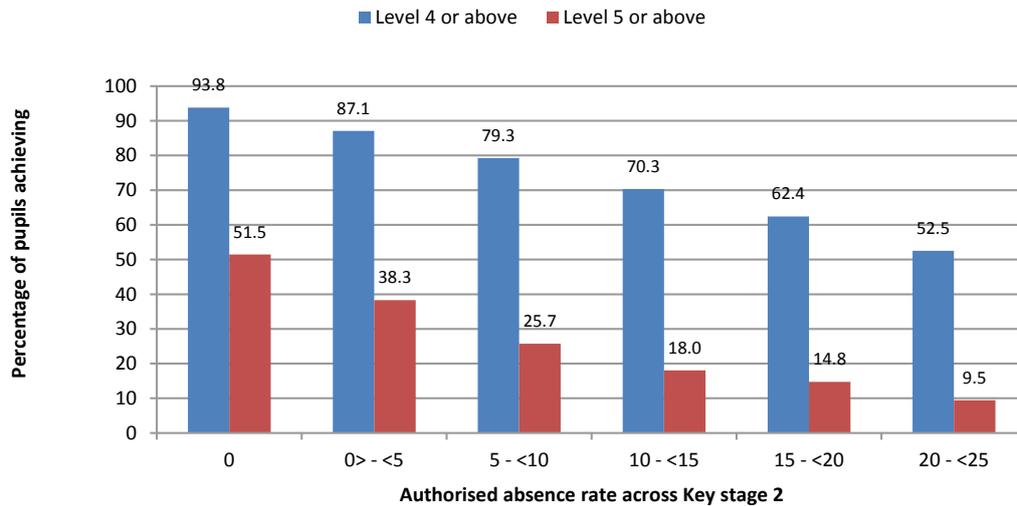
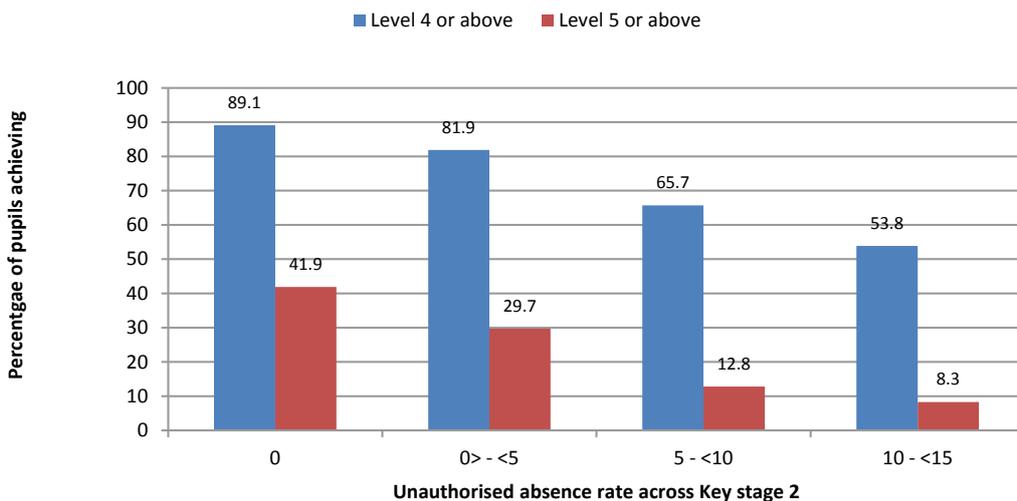


Figure 5: Percentage of pupils in state-funded mainstream schools achieving stated levels at the end of KS2 in 2013/14 academic year by unauthorised absence rate across KS2



Figures 4 and 5 show, for authorised and unauthorised absence, the higher the percentage of sessions missed across the key stage, the lower the likely level of attainment at the end of KS2.

When comparing individual reasons for absence to the percentage of pupils achieving different levels at the end of KS2, the majority of reasons appear to have a generally negative link to attainment or no clear trend (see tables 4 to 7 of the accompanying data tables). In the further analysis of KS2 indicators which is included later in the report (section 4.4), and takes into account prior attainment and other pupil characteristics, we see that all individual reasons for absence have either a statistically significant negative link to KS2 attainment or no statistically significant effect (at the 0.05 level), since the number of days missed overall is the main explanatory factor and knowing the individual reasons does not add much explanatory power.

### 4.3 The link between absence and attainment at key stage 4

KS4 exams are taken by pupils at the end of secondary school education, with this key stage usually being taught over two years (from year 10 to year 11). In this release the number of end of KS4 pupils achieving 5 or more GCSEs or equivalent at grades A\*-C, 5 or more GCSEs or equivalent at grades A\*-C, including English and mathematics, and those achieving the English Baccalaureate have been considered. See technical note 2 for details of how to find out more information on the way attainment is measured at the end of KS4.

For pupils at the end of KS4 as the level of overall absence increases, the percentage of pupils achieving the three KS4 attainment measures decreases. As for KS2, the link between overall absence and attainment is evident when looking at increasing overall absence rates or increasing numbers of weeks missed.

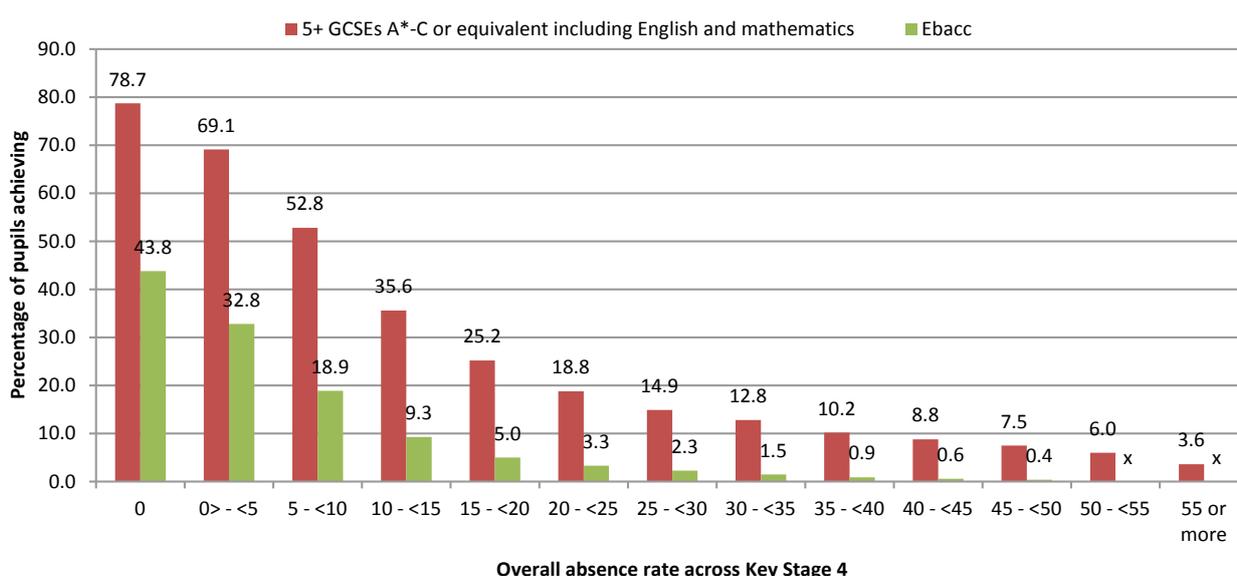
An alternative presentation, where pupils are grouped equally into percentiles based on their ordered overall absence rates, showed a more gradual, but still downward, trend.

This link between absence and attainment has remained similar over the past six academic years (since 2008/09).

In the main report findings are only shown for those achieving 5 or more GCSEs or equivalent at grades A\*-C, including English and mathematics, and those achieving the English Baccalaureate. However, a similar trend is seen for those achieving 5 or more GCSEs or equivalent at grades A\*-C.

#### 4.3.1 Percentage point bands based on overall absence rate

Figure 6: Percentage of pupils in state-funded mainstream schools achieving stated qualifications at the end of KS4 in 2013/14 academic year by overall absence rate across KS4



Overall absence rate across KS4:	0	0> -<5	5 - <10	10 - <15	15 - <20	20 - <25	25 - <30	30 - <35	35 - <40	40 - <45	45 - <50	50 - <55	55 or more
Number of pupils	12,130	291,820	126,675	40,385	14,525	6,845	3,750	2,300	1,555	1,055	790	545	1,400

Figure 6 shows that pupils with no absence are 2.2 times more likely to achieve 5 or more GCSEs or equivalent at grades A\*-C including English and mathematics and 4.7 times more likely to achieve the English Baccalaureate than pupils missing 10-15 per cent of KS4 sessions.

#### 4.3.2 Number of weeks missed due to overall absence

Figure 7: Percentage of pupils in state-funded mainstream schools achieving stated qualifications at the end of KS4 in 2013/14 academic year by the number of weeks missed due to overall absence across KS4

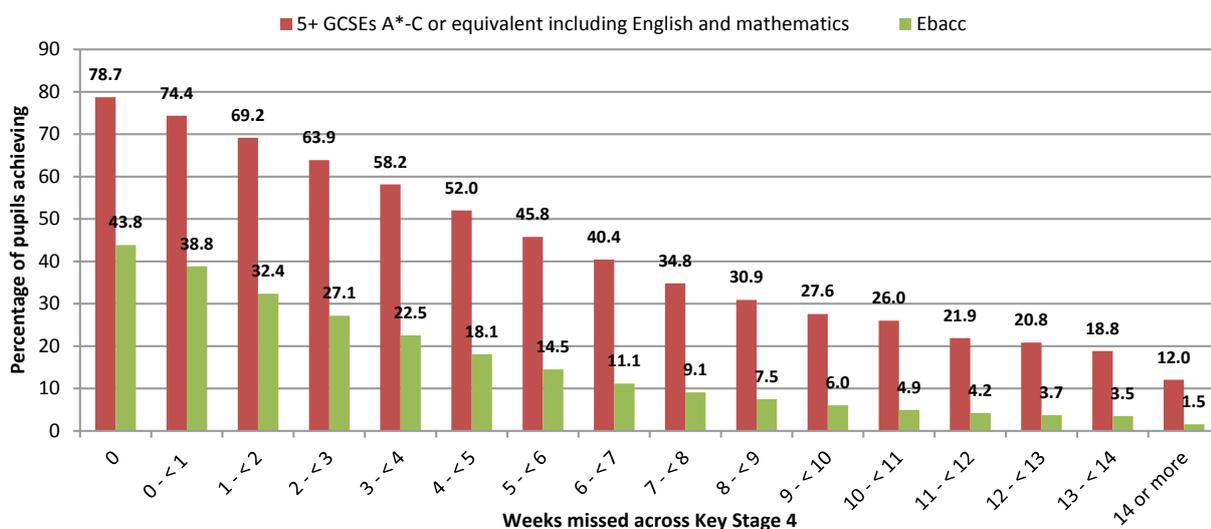


Figure 7 shows that pupils with no absence are 1.1 times more likely to achieve 5 or more GCSEs or equivalent at grades A\*-C including English and mathematics, and 1.4 times more likely to achieve the English Baccalaureate than pupils missing around one week in each key stage 4 year due to overall absence (this equates to between one and two weeks across the full key stage).

#### 4.3.3 Percentiles based on overall absence rate

Figure 8 shows KS4 attainment by levels of overall absence split into percentile bands which contain roughly equal numbers of pupils. Again, technical note 13 provides further information on how the data has been grouped.

Figure 8: Percentage of pupils in state-funded mainstream schools achieving stated qualifications at the end of KS4 in 2013/14 academic year based on grouping pupils into

## percentile bands according to their overall absence rate across KS4

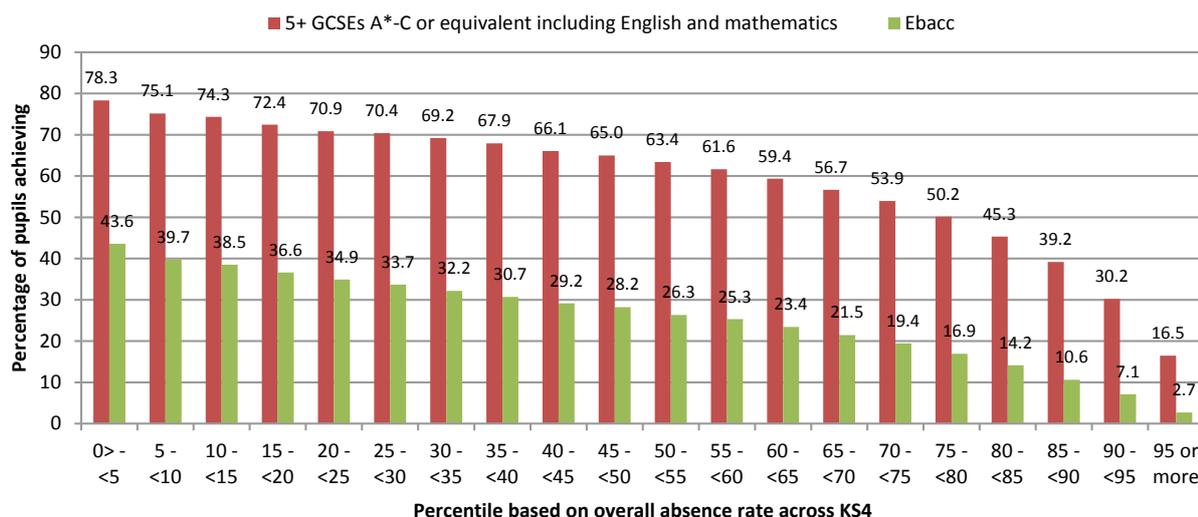


Figure 8 shows that the five per cent of pupils with the lowest overall absence rates (the 0 to 5<sup>th</sup> percentiles) are 4.7 times more likely to achieve 5 or more GCSEs or equivalent at grades A\*-C including English and mathematics and around 16.1 times more likely to achieve the English Baccalaureate than the five per cent of pupils with the highest overall absence rates (the 95<sup>th</sup> or higher percentiles).

The five per cent of pupils with the lowest overall absence rates are 1.2 times more likely to achieve 5 or more GCSEs or equivalent at grades A\*-C including English and mathematics and around 1.7 times more likely to achieve the English Baccalaureate than the five per cent of pupils within the 50 to 55<sup>th</sup> percentiles.

### 4.3.4 The link between reason for absence and attainment at key stage 4

The link between levels of total authorised and total unauthorised absence and the qualifications achieved at the end of KS4 is also similar to the picture seen for overall absence.

Figure 9: Percentage of pupils in state-funded mainstream schools achieving stated qualifications at the end of KS4 in 2013/14 academic year by authorised absence rate across KS4

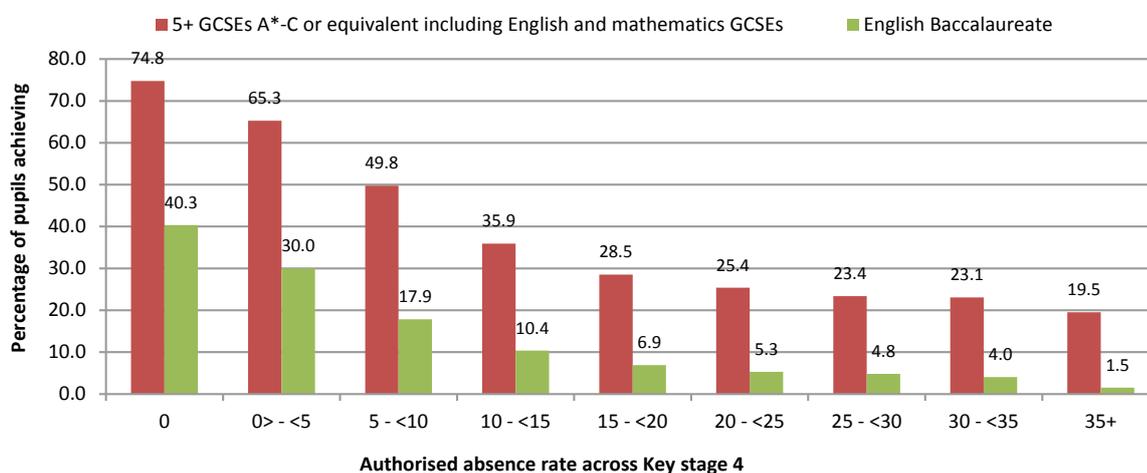
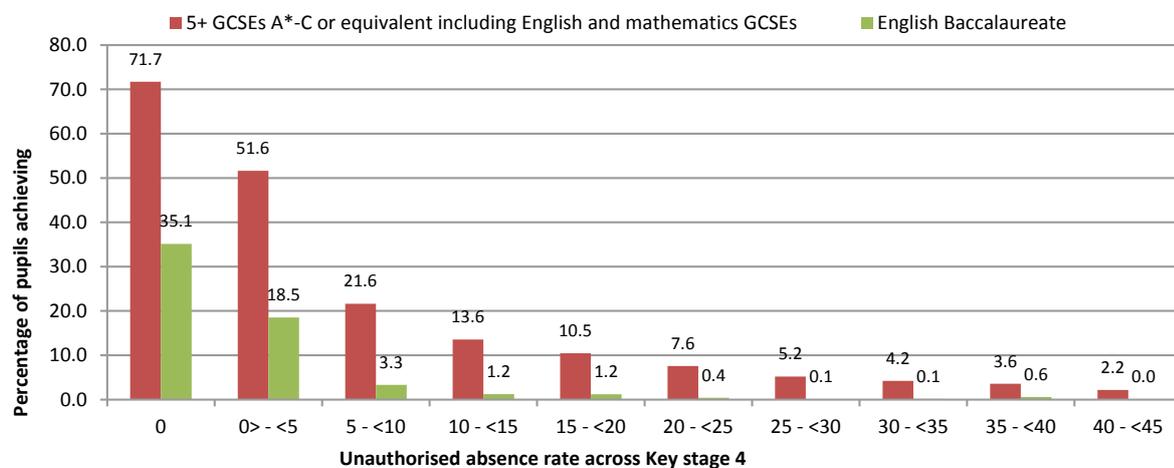


Figure 10: Percentage of pupils in state-funded mainstream schools achieving stated qualifications at the end of KS4 in 2013/14 academic year by unauthorised absence rate across KS4



Figures 9 and 10 show, for authorised and unauthorised absence, the higher the percentage of sessions missed across the key stage, the lower the likely level of attainment at the end of KS4.

When comparing individual reasons for absence to the percentage of pupils achieving different levels at the end of KS4, the majority of reasons appear to have a generally negative link to attainment or no clear trend (see tables 11 to 14 of the accompanying data tables) with the exception of study leave<sup>10</sup> which appears to have a positive link. In the further analysis of KS4 indicators which is included later in the report (section 4.4), and takes into account prior attainment and other pupil characteristics, we see that all individual reasons for absence except study leave have either a statistically significant negative link to KS4 attainment or no statistically significant effect (at the 0.05 level), since the number of days missed overall is the main explanatory factor and knowing the individual reasons does not add much explanatory power.

#### 4.4 Assessing the impact of absence on attainment after controlling for other factors

Pupils with lower and higher levels of overall absence and absence due to individual reasons tend to differ in terms of their characteristics. There are a number of broader characteristics which are likely to be linked to their level of attainment.

<sup>10</sup> Study leave absence may be more prevalent in the 6<sup>th</sup> half term which is not included in our analysis (see technical note 5)

Table 2: Comparison of the FSM eligibility and SEN status of those pupils in state-funded mainstream schools with the highest and lowest 5 per cent of overall absence rates for KS2 and KS4

	Key stage 2		Key stage 4	
	Pupils with lowest 5 per cent of overall absence rates	Pupils with highest 5 per cent of overall absence rates	Pupils with lowest 5 per cent of overall absence rates	Pupils with highest 5 per cent of overall absence rates
Percentage of pupils eligible for free school meals (FSM)	7.6	44.2	7.6	35.7
Percentage of pupils with a special educational need (SEN) <sup>11</sup>	11.5	41.4	11.6	40.6

Table 2 shows a similar picture across KS2 and KS4, with those pupils with the highest 5 per cent of overall absence rates being far more likely to be eligible for free school meals or to have a special educational need. Characteristics such as these are known to be linked to the likelihood of achieving key measures in attainment<sup>12</sup> and the values shown in the table above highlight the need to control for additional factors within this analysis in order to get a more complete understanding of the relative explanatory power of absence on attainment at both KS2 and KS4.

#### 4.4.1 Results from logistic regression model

This following information describes the results from modelling each key measure of KS2 and KS4 attainment to investigate the link between absence and attainment when prior attainment and pupil characteristics are also taken into account.

For each KS2 and KS4 attainment measure the analysis showed that overall absence had a significantly negative link to attainment. Meaning, when keeping other factors constant, an increase in the number of overall absence sessions is associated with a lower likelihood of achieving key KS2 and KS4 outcomes.

For pupils with the same prior attainment and characteristics, for each one-session (half a day) increase in overall absence across KS2 there is:

- *A reduction of around 0.2 per cent in the likelihood of achieving a level 4 or above in reading and mathematics*
- *A reduction of around 0.4 per cent in the likelihood of achieving a level 5 or above in reading and mathematics*

<sup>11</sup> Includes pupils with a statement of SEN and those at school action or school action plus

<sup>12</sup> See latest assessments of [KS2 results by pupil characteristics](#) and [KS4 results by pupil characteristics](#)

*What does this mean?*

To assess the effect of an additional session of absence on attainment you need to know the initial likelihood of the pupil achieving the stated measure.

For example, consider two pupils, pupil A and pupil B, with the same prior attainment and characteristics and who therefore have the same likelihood of achieving a level 4 or above at the end of KS2. However, pupil B has had an additional session of overall absence.

So if the odds of pupil A achieving a level 4 was 60 per cent, the odds of pupil B (identical apart from an extra session of absence) achieving a level 4 is 0.4 per cent less than pupil A which corresponds to reduced odds of 59.8 per cent, this figure is calculated by:

$$60 \times \left(1 - \frac{0.4}{100}\right) = 59.8$$

For pupils with the same prior attainment and characteristics, for each one-session increase in overall absence across KS4 there is:

- *A reduction of around 1.8 per cent in the likelihood of achieving 5 A\*-C grades at GCSE or equivalent, including English and mathematics*
- *A reduction of around 2.1 per cent in the likelihood of achieving the English Baccalaureate*

*What does this mean?*

To assess the effect of an additional session of absence on attainment you need to know the initial likelihood of the pupil achieving the stated measure.

For example, consider two pupils, pupil A and pupil B, with the same prior attainment and characteristics who therefore have the same likelihood of achieving 5 A\*-C grades at GCSE or equivalent, including English and mathematics at the end of KS4. However, pupil B has had an additional session of overall absence.

So if the odds of pupil A achieving 5 A\*-C grades at GCSE or equivalent, including English and mathematics was 50 per cent, the odds of pupil B (identical apart from an extra session of absence) achieving 5 A\*-C grades at GCSE or equivalent, including English and mathematics is 1.8 per cent less than pupil A, which corresponds to reduced odd of 49.1 per cent, this figure is calculated by:

$$50 \times \left(1 - \frac{1.8}{100}\right) = 49.1$$

For both KS2 and KS4, extending the model to assess individual reasons for absence did not add a greater understanding of the link between absence and attainment. Meaning that once you know the number of days a pupil has missed through absence, knowing the reason for absence does not add any further explanatory power.

Table 3 shows the relative AUC figures for each KS2 and KS4 indicator. From this it is clear to see that adding individual reasons for absence to the model (in model 2) does not substantially increase the model fit.

Table 3: Comparison of the AUC for each model for KS2 and KS4

Indicator	Model 1	Model 2
<b>KS2</b>		
Level 4 or above	0.896	0.896
Level 5 or above	0.873	0.873
<b>KS4</b>		
5 GCSEs at grade A*-C including English and maths	0.850	0.854
English Baccalaureate	0.836	0.840

For both KS2 and KS4, extending the model to assess individual reasons for absence showed that all individual reasons for absence have either a statistically significant negative link to attainment or no statistically significant effect (at the 0.05 level), since the number of days missed overall is the main explanatory factor and knowing the individual reasons does not add much explanatory power. The only exception to this was absence for study leave at KS4 which had a statistically significant positive link to the likelihood of achieving at the end of KS4.

Absence due to family holidays can be classified as either authorised<sup>13</sup> or unauthorised absence depending on the circumstances. For the extended model to assess individual reasons for absence, agreed holidays and those that were not agreed were included separately. This showed that absence due to either type of family holiday at KS4, and due to family holiday that was not agreed at KS2, has a statistically significant negative effect on attainment and that agreed family holiday absence has no statistically significant effect at KS2. We also ran a second extended model including combined family holiday absence in place of the two individual reasons which showed that overall absence due to family holiday has a statistically significant negative link to attainment at both KS2 and KS4. The output from each individual model is included in Annex B.

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<sup>13</sup> Granted at the school's discretion, in exceptional circumstances only

## 5. Conclusions

Overall the analysis shows that as the level of overall absence across the relevant key stage increases, the likelihood of achieving key attainment outcomes at the end of KS2 and KS4 decreases. When controlling for other factors known to affect achievement, such as prior attainment and pupil characteristics, overall absence has been shown to have a statistically significant negative link to attainment. For both KS2 and KS4, extending the model to assess individual reasons for absence did not provide a greater understanding of the link between absence and attainment.

## Annex A: Technical notes

### A.1 Data sources and manipulation

1. Absence information is collected termly through the school census. The [school census guidance](#) includes information on the collection of pupil absence data. A [technical specification](#) is also available, which gives detailed explanations of what data are collected and what validation processes are carried out.
2. Attainment data for all pupils at the end of key stage 4 (KS4) is collected from the awarding bodies by the Department's contractor. Further information can be found in the '[GCSE and equivalent results in England](#)' quality and methodology information section.

Attainment data for all pupils at the end of key stage 2 (KS2) is collected by the Standards and Testing Agency (STA), an executive agency of the Department. Further information can be found in the '[Attainment in primary schools in England](#)' quality and methodology information section.

3. The pupil absence and attainment data used in this release have been created by matching data cuts from the [National Pupil Database \(NPD\)](#), a longitudinal database which holds a wide range of pupil level data for schools across England.

Absence data was derived from school census returns, which feed into the NPD. Enrolment level information has been aggregated to pupil level using a unique pupil identifier, summing all absence and possible session data for each pupil regardless of which school the sessions were accrued at. This absence data was then summed across years, to give total figures for the relevant key stage.

Attainment data has been sourced from annual NPD extracts, duplicates have been removed and the data has been filtered to leave just those pupils at the end of the key stage with valid attainment data.

This data was then matched together using the NPD's unique pupil reference number. Any pupils not meeting the criteria for this release, outlined in section 3.2 and technical notes 9 and 10, were removed before the analysis was undertaken.

### A.2 Data coverage and quality

4. This release includes pupils in state-funded mainstream schools including academies, free schools and city technology colleges, excluding state-funded special schools, independent schools, independent special schools, non-maintained special schools, hospital schools and alternative provision including academy and free school alternative provision and pupil referral units. Information on children not registered at a school is not included.

5. The figures presented in this report relate to attainment data from the 2013/14 academic year for the end of KS2 and end of KS4 pupils. However, absence data from across all years relevant to each key stage has been used.

Specifically, for pupils at end of KS2 in 2013/14, absence data from 2010/11, 2011/12, 2012/13, and 2013/14 has been used to calculate overall absence rates.

Similarly for pupils at the end of KS4 in 2013/14 absence data for 2012/13 and 2013/14 have been used to calculate overall absence rates.

In 2012/13 absence information for the second half of the summer term was collected by the school census for the first time; previously absence information was only collected for the first five half terms. To maintain comparability between academic years this sixth half term of data has been excluded from the analysis.

For KS2 pupils in 2008/09 absence data only includes absence for years four, five and six, this is due to absence data first being collected at enrolment level for all schools in 2006/07.

6. The absence information collected via the school census counts the number of pupil enrolments rather than the number of pupils. Pupil absence is recorded for the period a pupil is enrolled at a school. Where a pupil moves schools or has a dual registration their absence may be returned from both schools, if both schools return absence data via the school census. For the purposes of this release, the data has been aggregated to pupil level, i.e. summing the absence across all of each pupil's enrolments each year. This is not the standard approach for the Department's other pupil absence releases; however it was deemed to be appropriate for this analysis in order to fully quantify a pupil's level of absence and its link to their attainment.
7. In this report's accompanying data tables there is a time series of figures looking at the link between absence and KS2 and KS4 attainment for 2008/09 to 2013/14 inclusive. In KS2 the state-funded school participation rate for national curriculum assessments in 2010 was 74 per cent due to industrial action, so as a result of this there are lower numbers of pupils at the end of KS2 included in the 2009/10 academic year figures.
8. The Department does not expect pupils of KS2 age to be granted authorised study leave absence. Study leave should be used sparingly and only granted to Year 11 pupils during public examinations.

### **A.3 Methodology**

9. All maintained schools are required to provide two possible sessions per day, morning and afternoon, to all pupils and schools must meet for at least 380 sessions or 190 days during any school year to educate their pupils.

Pupils that do not have a full set of possible sessions across the whole of KS2 or KS4 have been removed from the analysis. This ensured that pupils with high values of possible sessions (which were likely to be incorrect) or those with extremely low numbers of possible sessions (for whom we would not be able to determine a full picture of the link between their absence and attainment) were removed and did not distort the findings.

These pupils have been identified by looking at a pupil's possible sessions and comparing it to the mode (most common) number of possible sessions across all pupils at the end of each key stage in each year.

Only pupils with possible sessions within 10 per cent either side of the mode value for each year have been included. Meaning that for a pupil to be included their total number of possible sessions each year must conform to the following -

$$\text{Mode possible sessions} \times 0.9 \leq \text{Possible sessions} \leq \text{Mode possible sessions} \times 1.1$$

Table 4 shows the possible session cut off values for pupils at the end of KS2 and KS4 in 2013/14. Using the table for KS4 pupils (whose absence information for the key stage covers 2012/13 and 2013/14) pupils must have had between 277.2 and 338.8 possible sessions in both 2012/13 and 2013/14 to be included; this means if a pupil has less than 277.2 possible sessions in either 2012/13 or 2013/14, then he/she will be excluded from the analysis.

Table 4: Mode values for possible sessions and corresponding cut offs for possible session filter for pupils at the end of each key stage in 2013/14

	KS2 - Possible sessions			KS4 - Possible sessions		
	mode - 10%	mode	mode + 10%	mode - 10%	mode	mode + 10%
2010/11	277.2	308	338.8			
2011/12	286.2	318 <sup>14</sup>	349.8			
2012/13	275.4	306	336.6	277.2	308	338.8
2013/14	275.4	306	336.6	277.2	308	338.8

10. For pupils who have valid attainment data at the end of KS2 or KS4, there are a number of possible reasons which may mean they do not have a full key stage of possible sessions and are therefore excluded from the analysis in this report.

Possible reasons include:

- A pupil joined the mainstream education sector part way through the key stage;
- A pupil left the mainstream education system temporarily, but returned later in the year or key stage;
- Matching or recording errors; or,

<sup>14</sup> The mode possible sessions for KS2 pupils in 2011/12 was higher than in other years because of the late May bank holiday in 2012. More information on term length and periods absence information is collected for is available in the [guide to absence statistics](#).

- A pupil may be dually registered with a special school or a Pupil Referral Unit (or another form of alternative provision) and such schools are not included in this analysis.

11. The overall absence rates in this release are based on all the periods of absence (authorised and unauthorised) a pupil has accrued across the full key stage:

$$\frac{\text{Total absence sessions across KS2/KS4}}{\text{Total sessions possible across KS2/KS4}} \times 100$$

Further details, including other calculations, can be found in the metadata specification document in the underlying data section accompanying this report.

## A.4 Presentation

12. Absence data is collected in terms of number of sessions missed, where each session is equivalent to half a day. Where absence information is presented in terms of days missed in the report or data tables, each half a day (one session) has been rounded up to the next full day i.e. one or two sessions equal one day, three or four sessions equal two days and so on.
13. In the release's data tables, tables 3 and 10 (Figures 3 and 8) show absence levels grouped by pupil percentiles, designed so that a similar number of pupils are present in each bracket. Pupils were placed in ascending order of overall absence rates across KS2/KS4 and then grouped into five per cent bands. For example, the 0- <5 per cent band includes the five per cent of pupils with the lowest overall absence rates across KS2/KS4 and the 95-100 per cent bracket contains the five per cent of pupils with the highest overall absence rates across KS2/KS4.
14. The report's main data tables have been presented in a way that ensures that there is a minimum of 500 pupils in each absence bracket. In some cases, where fewer than 500 pupils have any absence for a particular reason the percentage achieving the stated achievement measure will not be shown. This is to enable more robust comparisons to be made between different levels of absence and groups of pupils. Within the reports underlying data, absence breakdowns will be presented at a lower level. Further details on the figures provided can be found in the metadata specification document in the underlying data accompanying this report.

## A.5 Further reading

15. The Department for Education has published '[Advice on School Attendance](#)', which explains how schools should apply the Education (Pupil Registration) (England) Regulations 2006 and subsequent amendments and the use of the national codes to record pupil attendance and absence in schools.

16. Further information on absence data can be found in the [‘Guide to absence statistics’](#).
17. Further information on KS2 attainment data can be found in the [‘Attainment in primary schools in England’](#) quality and methodology information section.
18. Further information on KS4 attainment data can be found in the [‘GCSE and equivalent results in England’](#) quality and methodology information section.

## Annex B: Model output

### B.1 Pupils achieving a level 4 or above at the end of KS2

Model 1:	Achieving a level 4 or above at the end of KS2				
	Coefficient	Std. Error	p value		Odds ratio
Constant	-9.955	0.535	<0.001	***	0.000
<b>Prior attainment</b>					
Prior attainment (KS1 point score)	0.417	0.002	<0.001	***	1.517
<b>Ethnic group</b>					
White - British					Reference group
White - Irish	0.515	0.112	<0.001	***	1.674
White - Traveller of Irish heritage	0.333	0.186	0.073		1.395
White - Gypsy/ Roma	-0.020	0.090	0.823		0.980
White - Any other White	0.524	0.036	<0.001	***	1.690
Mixed - White and Asian	0.116	0.056	0.039	*	1.123
Mixed - White and Black African	0.185	0.075	0.013	*	1.203
Mixed - White and Black Caribbean	0.070	0.042	0.091		1.073
Mixed - Any other Mixed	0.315	0.045	<0.001	***	1.370
Asian - Bangladeshi	0.167	0.048	0.001	***	1.182
Asian - Indian	0.031	0.044	0.482		1.032
Asian - Any other Asian	0.442	0.059	<0.001	***	1.555
Asian - Pakistani	-0.228	0.034	<0.001	***	0.796
Black - Black African	0.185	0.037	<0.001	***	1.203
Black - Black Caribbean	0.060	0.039	0.121		1.062
Black - Any other Black	0.073	0.061	0.233		1.076
Chinese - Chinese	0.988	0.148	<0.001	***	2.685
Any other ethnic group	0.398	0.054	<0.001	***	1.489
Not obtained	-0.254	0.117	0.029	*	0.775
Refused	0.116	0.085	0.169		1.123
<b>First Language</b>					
English					Reference group
Other than English	0.309	0.028	<0.001	***	1.362
Unclassified	0.401	0.196	0.041	*	1.493
<b>SEN provision</b>					
No SEN					Reference group
School action	-0.946	0.013	<0.001	***	0.388
School action plus	-1.193	0.016	<0.001	***	0.303
Statement of SEN	-1.505	0.031	<0.001	***	0.222
<b>FSM eligibility</b>					
Not eligible					Reference group
Eligible for and claiming	-0.078	0.013	<0.001	***	0.925
<b>Gender</b>					
Girl					Reference group
Boy	0.564	0.011	<0.001	***	1.758
<b>Absence information</b>					
Possible sessions across KS2	0.005	0.000	<0.001	***	1.005
Overall absence sessions across KS4	-0.002	0.000	<0.001	***	0.998

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

Goodness of fit – AUC = 0.896

Model 2:		Achieving a level 4 or above at the end of KS2			
	Coefficient	Std. Error	p value		Odds ratio
Constant	-9.916	0.536	<0.001	***	0.000
<b>Prior attainment</b>					
Prior attainment (KS1 point score)	0.418	0.002	<0.001	***	1.518
<b>Ethnic group</b>					
White - British					Reference group
White - Irish	0.513	0.112	<0.001	***	1.671
White - Traveller of Irish heritage	0.232	0.187	0.213		1.262
White - Gypsy/ Roma	-0.068	0.092	0.461		0.935
White - Any other White	0.523	0.036	<0.001	***	1.688
Mixed - White and Asian	0.107	0.056	0.057		1.113
Mixed - White and Black African	0.184	0.075	0.014	*	1.202
Mixed - White and Black Caribbean	0.068	0.042	0.101		1.070
Mixed - Any other Mixed	0.310	0.045	<0.001	***	1.364
Asian - Bangladeshi	0.147	0.050	0.003	**	1.158
Asian - Indian	0.023	0.045	0.608		1.023
Asian - Any other Asian	0.431	0.059	<0.001	***	1.539
Asian - Pakistani	-0.255	0.038	<0.001	***	0.775
Black - Black African	0.178	0.037	<0.001	***	1.194
Black - Black Caribbean	0.059	0.039	0.133		1.060
Black - Any other Black	0.069	0.061	0.261		1.071
Chinese - Chinese	0.985	0.148	<0.001	***	2.678
Any other ethnic group	0.384	0.054	<0.001	***	1.468
Not obtained	-0.256	0.117	0.028	*	0.774
Refused	0.112	0.085	0.188		1.118
<b>First Language</b>					
English					Reference group
Other than English	0.302	0.028	<0.001	***	1.353
Unclassified	0.398	0.196	0.043	*	1.488
<b>SEN provision</b>					
No SEN					Reference group
School action	-0.943	0.013	<0.001	***	0.390
School action plus	-1.181	0.016	<0.001	***	0.307
Statement of SEN	-1.472	0.031	<0.001	***	0.229
<b>FSM eligibility</b>					
Not eligible					Reference group
Eligible for and claiming	-0.077	0.013	<0.001	***	0.926
<b>Gender</b>					
Girl					Reference group
Boy	0.565	0.011	<0.001	***	1.759
<b>Absence information</b>					
Possible sessions across KS2	0.005	0.000	<0.001	***	1.005
Illness	-0.003	0.000	<0.001	***	0.997
Medical appointment	-0.006	0.001	<0.001	***	0.994
Religious observance	0.004	0.003	0.266		1.004
Study leave	-0.146	0.062	0.019	*	0.864
Traveller	0.001	0.001	0.539		1.001
Authorised holidays	0.001	0.001	0.066		1.001
Excluded	-0.006	0.002	0.009	**	0.994
Authorised other	-0.003	0.001	<0.001	***	0.997
Unauthorised holidays	-0.004	0.001	<0.001	***	0.996
Late	-0.001	0.001	0.247		0.999
No reason yet	0.000	0.001	0.747		1.000
Unauthorised other	-0.001	0.000	<0.001	***	0.999

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

Goodness of fit – AUC = 0.896

## B.2 Pupils achieving a level 5 or above at the end of KS2

Model 1:	Achieving a level 5 or above at the end of KS2				
	Coefficient	Std. Error	p value		Odds ratio
Constant	-16.230	0.405	<0.001	***	0.000
<b>Prior attainment</b>					
Prior attainment (KS1 point score)	0.585	0.002	<0.001	***	1.795
<b>Ethnic group</b>					
White - British					Reference group
White - Irish	0.448	0.070	<0.001	***	1.566
White - Traveller of Irish heritage	-0.048	0.308	0.877		0.953
White - Gypsy/ Roma	-0.089	0.158	0.574		0.915
White - Any other White	0.615	0.025	<0.001	***	1.850
Mixed - White and Asian	0.334	0.037	<0.001	***	1.396
Mixed - White and Black African	0.030	0.054	0.575		1.031
Mixed - White and Black Caribbean	-0.107	0.035	0.002	**	0.898
Mixed - Any other Mixed	0.263	0.031	<0.001	***	1.301
Asian - Bangladeshi	0.205	0.035	<0.001	***	1.227
Asian - Indian	0.317	0.028	<0.001	***	1.373
Asian - Any other Asian	0.475	0.036	<0.001	***	1.608
Asian - Pakistani	0.032	0.027	0.223		1.033
Black - Black African	0.183	0.027	<0.001	***	1.201
Black - Black Caribbean	-0.268	0.037	<0.001	***	0.765
Black - Any other Black	-0.024	0.053	0.651		0.976
Chinese - Chinese	1.117	0.071	<0.001	***	3.056
Any other ethnic group	0.456	0.038	<0.001	***	1.578
Not obtained	-0.097	0.107	0.368		0.908
Refused	0.182	0.062	0.003	**	1.199
<b>First Language</b>					
English					Reference group
Other than English	0.229	0.020	<0.001	***	1.257
Unclassified	0.253	0.137	0.066		1.287
<b>SEN provision</b>					
No SEN					Reference group
School action	-0.627	0.020	<0.001	***	0.534
School action plus	-0.390	0.024	<0.001	***	0.677
Statement of SEN	-0.076	0.052	0.148		0.927
<b>FSM eligibility</b>					
Not eligible					Reference group
Eligible for and claiming	-0.232	0.013	<0.001	***	0.793
<b>Gender</b>					
Girl					Reference group
Boy	0.490	0.008	<0.001	***	1.633
<b>Absence information</b>					
Possible sessions across KS2	0.005	0.000	<0.001	***	1.005
Overall absence sessions across KS4	-0.004	0.000	<0.001	***	0.996

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

Goodness of fit – AUC = 0.873

Model 2:		Achieving a level 5 or above at the end of KS2			
	Coefficient	Std. Error	p value		Odds ratio
Constant	-16.100	0.405	<0.001	***	0.000
<b>Prior attainment</b>					
Prior attainment (KS1 point score)	0.585	0.002	<0.001	***	1.795
<b>Ethnic group</b>					
White - British					Reference group
White - Irish	0.449	0.071	<0.001	***	1.567
White - Traveller of Irish heritage	-0.081	0.309	0.794		0.922
White - Gypsy/ Roma	-0.106	0.160	0.509		0.899
White - Any other White	0.613	0.025	<0.001	***	1.846
Mixed - White and Asian	0.333	0.038	<0.001	***	1.395
Mixed - White and Black African	0.031	0.054	0.571		1.031
Mixed - White and Black Caribbean	-0.102	0.035	0.004	**	0.903
Mixed - Any other Mixed	0.263	0.031	<0.001	***	1.301
Asian - Bangladeshi	0.211	0.036	<0.001	***	1.235
Asian - Indian	0.309	0.028	<0.001	***	1.362
Asian - Any other Asian	0.471	0.036	<0.001	***	1.602
Asian - Pakistani	0.034	0.030	0.245		1.035
Black - Black African	0.188	0.027	<0.001	***	1.207
Black - Black Caribbean	-0.264	0.037	<0.001	***	0.768
Black - Any other Black	-0.021	0.053	0.688		0.979
Chinese - Chinese	1.100	0.071	<0.001	***	3.004
Any other ethnic group	0.453	0.039	<0.001	***	1.573
Not obtained	-0.096	0.107	0.372		0.909
Refused	0.182	0.062	0.003	**	1.200
<b>First Language</b>					
English					Reference group
Other than English	0.228	0.020	<0.001	***	1.256
Unclassified	0.251	0.137	0.068		1.285
<b>SEN provision</b>					
No SEN					Reference group
School action	-0.623	0.020	<0.001	***	0.536
School action plus	-0.380	0.024	<0.001	***	0.684
Statement of SEN	-0.058	0.053	0.276		0.944
<b>FSM eligibility</b>					
Not eligible					Reference group
Eligible for and claiming	-0.223	0.013	<0.001	***	0.800
<b>Gender</b>					
Girl					Reference group
Boy	0.491	0.008	<0.001	***	1.634
<b>Absence information</b>					
Possible sessions across KS2	0.005	0.000	<0.001	***	1.005
Illness	-0.005	0.000	<0.001	***	0.995
Medical appointment	-0.004	0.001	<0.001	***	0.996
Religious observance	-0.004	0.002	0.102		0.996
Study leave	0.040	0.051	0.430		1.041
Traveller	-0.003	0.002	0.157		0.997
Authorised holidays	0.001	0.000	0.236		1.001
Excluded	-0.016	0.004	<0.001	***	0.984
Authorised other	-0.001	0.001	0.171		0.999
Unauthorised holidays	-0.003	0.001	<0.001	***	0.997
Late	-0.004	0.002	0.022	*	0.996
No reason yet	-0.004	0.001	0.001	***	0.996
Unauthorised other	-0.003	0.000	<0.001	***	0.997

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

Goodness of fit – AUC = 0.873

## B.3 Pupils achieving 5 GCSES at grades A\*-C including English and mathematics at the end of KS4

Model 1:	Achieving 5 A*-C including English and Maths at the end of KS4				
	Coefficient	Std. Error	P value		Odds ratio
Constant	-6.553	0.263	<0.001	***	0.001
<b>Prior attainment</b>					
Prior attainment (KS2 point score)	0.159	0.001	<0.001	***	1.172
<b>Ethnic group</b>					
White - British				Reference group	
White - Irish	0.594	0.064	<0.001	***	1.811
White - Traveller of Irish heritage	-0.078	0.317	0.806		0.925
White - Gypsy/ Roma	-0.667	0.146	<0.001	***	0.513
White - Any other White	0.825	0.025	<0.001	***	2.282
Mixed - White and Asian	0.673	0.042	<0.001	***	1.961
Mixed - White and Black African	0.288	0.054	<0.001	***	1.333
Mixed - White and Black Caribbean	-0.070	0.029	0.016	*	0.932
Mixed - Any other Mixed	0.461	0.032	<0.001	***	1.586
Asian - Bangladeshi	0.411	0.033	<0.001	***	1.509
Asian - Indian	0.736	0.028	<0.001	***	2.087
Asian - Any other Asian	0.868	0.037	<0.001	***	2.382
Asian - Pakistani	0.048	0.024	0.042	*	1.049
Black - Black African	0.456	0.025	<0.001	***	1.577
Black - Black Caribbean	-0.188	0.029	<0.001	***	0.829
Black - Any other Black	0.116	0.048	0.015	*	1.123
Chinese - Chinese	1.460	0.087	<0.001	***	4.304
Any other ethnic group	0.846	0.038	<0.001	***	2.331
Not obtained	0.247	0.057	<0.001	***	1.281
Refused	0.327	0.049	<0.001	***	1.387
<b>First Language</b>					
English				Reference group	
Other than English	0.099	0.018	<0.001	***	1.105
Unclassified	-0.265	0.083	0.001	**	0.767
<b>SEN provision</b>					
No SEN				Reference group	
School action	-1.205	0.012	<0.001	***	0.300
School action plus	-1.178	0.017	<0.001	***	0.308
Statement of SEN	-1.367	0.031	<0.001	***	0.255
<b>FSM eligibility</b>					
Not eligible				Reference group	
Eligible for and claiming	-0.561	0.010	<0.001	***	0.570
<b>Gender</b>					
Girl				Reference group	
Boy	-0.475	0.007	<0.001	***	0.622
<b>Absence information</b>					
Possible sessions across KS4	0.006	0.000	<0.001	***	1.006
Overall absence sessions across KS4	-0.018	0.000	<0.001	***	0.982

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

Goodness of fit – AUC = 0.850

Model 2:		Achieving 5 A*-C including English and Maths at the end of KS4			
	Coefficient	Std. Error	p value		Odds ratio
Constant	-6.010	0.266	<0.001	***	0.002
<b>Prior attainment</b>					
Prior attainment (KS2 point score)	0.153	0.001	<0.001	***	1.166
<b>Ethnic group</b>					
White - British				Reference group	
White - Irish	0.587	0.065	<0.001	***	1.799
White - Traveller of Irish heritage	0.136	0.325	0.676		1.146
White - Gypsy/ Roma	-0.563	0.149	<0.001	***	0.570
White - Any other White	0.852	0.025	<0.001	***	2.343
Mixed - White and Asian	0.691	0.043	<0.001	***	1.996
Mixed - White and Black African	0.336	0.055	<0.001	***	1.399
Mixed - White and Black Caribbean	0.005	0.030	0.867		1.005
Mixed - Any other Mixed	0.493	0.032	<0.001	***	1.638
Asian - Bangladeshi	0.485	0.034	<0.001	***	1.624
Asian - Indian	0.730	0.029	<0.001	***	2.076
Asian - Any other Asian	0.871	0.038	<0.001	***	2.390
Asian - Pakistani	0.123	0.026	<0.001	***	1.131
Black - Black African	0.540	0.025	<0.001	***	1.716
Black - Black Caribbean	-0.089	0.029	0.002	**	0.915
Black - Any other Black	0.208	0.049	<0.001	***	1.231
Chinese - Chinese	1.395	0.086	<0.001	***	4.037
Any other ethnic group	0.904	0.038	<0.001	***	2.468
Not obtained	0.075	0.059	0.203		1.078
Refused	0.336	0.050	<0.001	***	1.400
<b>First Language</b>					
English				Reference group	
Other than English	0.119	0.019	<0.001	***	1.127
Unclassified	-0.196	0.085	0.021	*	0.822
<b>SEN provision</b>					
No SEN				Reference group	
School action	-1.202	0.012	<0.001	***	0.301
School action plus	-1.142	0.017	<0.001	***	0.319
Statement of SEN	-1.416	0.031	<0.001	***	0.243
<b>FSM eligibility</b>					
Not eligible				Reference group	
Eligible for and claiming	-0.471	0.011	<0.001	***	0.624
<b>Gender</b>					
Girl				Reference group	
Boy	-0.448	0.007	<0.001	***	0.639
<b>Absence information</b>					
Possible sessions across KS4	0.005	0.000	<0.001	***	1.005
Illness	-0.014	0.000	<0.001	***	0.986
Medical appointment	-0.006	0.001	<0.001	***	0.994
Religious observance	-0.032	0.005	<0.001	***	0.969
Study leave	0.043	0.001	<0.001	***	1.044
Traveller	-0.013	0.004	0.002	**	0.987
Authorised holidays	-0.012	0.001	<0.001	***	0.988
Excluded	-0.104	0.002	<0.001	***	0.902
Authorised other	-0.017	0.001	<0.001	***	0.983
Unauthorised holidays	-0.027	0.001	<0.001	***	0.974
Late	-0.042	0.002	<0.001	***	0.959
No reason yet	-0.032	0.001	<0.001	***	0.968
Unauthorised other	-0.027	0.000	<0.001	***	0.973

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

Goodness of fit – AUC = 0.854

## B.4 Pupils achieving the English Baccalaureate at the end of KS4

Model 1:		Achieving the English Baccalaureate at the end of KS4			
	Coefficient	Std. Error	p value		Odds ratio
Constant	-9.716	0.283	<0.001	***	0.000
<b>Prior attainment</b>					
Prior attainment (KS2 point score)	0.217	0.001	<0.001	***	1.242
<b>Ethnic group</b>					
White - British					Reference group
White - Irish	0.608	0.057	<0.001	***	1.837
White - Traveller of Irish heritage	-0.280	0.617	0.650		0.756
White - Gypsy/ Roma	-1.157	0.331	<0.001	***	0.314
White - Any other White	0.832	0.023	<0.001	***	2.299
Mixed - White and Asian	0.633	0.037	<0.001	***	1.884
Mixed - White and Black African	0.301	0.056	<0.001	***	1.351
Mixed - White and Black Caribbean	-0.154	0.035	<0.001	***	0.857
Mixed - Any other Mixed	0.521	0.030	<0.001	***	1.684
Asian - Bangladeshi	0.348	0.033	<0.001	***	1.416
Asian - Indian	0.655	0.024	<0.001	***	1.926
Asian - Any other Asian	0.775	0.033	<0.001	***	2.170
Asian - Pakistani	0.132	0.025	<0.001	***	1.141
Black - Black African	0.340	0.024	<0.001	***	1.405
Black - Black Caribbean	-0.294	0.036	<0.001	***	0.745
Black - Any other Black	0.100	0.054	0.066		1.105
Chinese - Chinese	1.162	0.060	<0.001	***	3.196
Any other ethnic group	0.871	0.035	<0.001	***	2.389
Not obtained	0.489	0.061	<0.001	***	1.631
Refused	0.405	0.049	<0.001	***	1.500
<b>First Language</b>					
English					Reference group
Other than English	0.136	0.018	<0.001	***	1.146
Unclassified	-0.071	0.092	0.437		0.931
<b>SEN provision</b>					
No SEN					Reference group
School action	-1.044	0.020	<0.001	***	0.352
School action plus	-0.938	0.029	<0.001	***	0.391
Statement of SEN	-0.956	0.055	<0.001	***	0.384
<b>FSM eligibility</b>					
Not eligible					Reference group
Eligible for and claiming	-0.615	0.014	<0.001	***	0.541
<b>Gender</b>					
Girl					Reference group
Boy	-0.610	0.007	<0.001	***	0.543
<b>Absence information</b>					
Possible sessions across KS4	0.006	0.000	<0.001	***	1.006
Overall absence sessions across KS4	-0.022	0.000	<0.001	***	0.979

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

Area Under the Curve = 0.840

Model 2:		Achieving the English Baccalaureate at the end of KS4			
	Coefficient	Std. Error	p value		Odds ratio
Constant	-8.732	0.287	<0.001	***	0.000
<b>Prior attainment</b>					
Prior attainment (KS2 point score)	0.197	0.001	<0.001	***	1.218
<b>Ethnic group</b>					
White - British				Reference group	
White - Irish	0.596	0.058	<0.001	***	1.815
White - Traveller of Irish heritage	0.067	0.639	0.916		1.070
White - Gypsy/ Roma	-0.996	0.337	0.003	**	0.369
White - Any other White	0.867	0.023	<0.001	***	2.379
Mixed - White and Asian	0.636	0.038	<0.001	***	1.890
Mixed - White and Black African	0.352	0.057	<0.001	***	1.422
Mixed - White and Black Caribbean	-0.072	0.035	0.042	*	0.930
Mixed - Any other Mixed	0.544	0.031	<0.001	***	1.723
Asian - Bangladeshi	0.393	0.034	<0.001	***	1.481
Asian - Indian	0.617	0.024	<0.001	***	1.853
Asian - Any other Asian	0.730	0.033	<0.001	***	2.075
Asian - Pakistani	0.160	0.027	<0.001	***	1.173
Black - Black African	0.397	0.025	<0.001	***	1.487
Black - Black Caribbean	-0.203	0.037	<0.001	***	0.817
Black - Any other Black	0.178	0.055	0.001	**	1.194
Chinese - Chinese	1.101	0.060	<0.001	***	3.007
Any other ethnic group	0.901	0.036	<0.001	***	2.463
Not obtained	0.305	0.063	<0.001	***	1.356
Refused	0.394	0.050	<0.001	***	1.483
<b>First Language</b>					
English				Reference group	
Other than English	0.159	0.018	<0.001	***	1.172
Unclassified	-0.010	0.095	0.915		0.990
<b>SEN provision</b>					
No SEN				Reference group	
School action	-1.055	0.020	<0.001	***	0.348
School action plus	-0.905	0.029	<0.001	***	0.404
Statement of SEN	-1.046	0.055	<0.001	***	0.351
<b>FSM eligibility</b>					
Not eligible				Reference group	
Eligible for and claiming	-0.497	0.015	<0.001	***	0.608
<b>Gender</b>					
Girl				Reference group	
Boy	-0.602	0.007	<0.001	***	0.547
<b>Absence information</b>					
Possible sessions across KS4	0.005	0.000	<0.001	***	1.005
Illness	-0.021	0.000	<0.001	***	0.980
Medical appointment	-0.008	0.001	<0.001	***	0.992
Religious observance	-0.007	0.005	0.164		0.993
Study leave	0.039	0.001	<0.001	***	1.040
Traveller	-0.079	0.064	0.211		0.924
Authorised holidays	-0.016	0.002	<0.001	***	0.985
Excluded	-0.165	0.005	<0.001	***	0.848
Authorised other	-0.015	0.001	<0.001	***	0.985
Unauthorised holidays	-0.035	0.001	<0.001	***	0.966
Late	-0.102	0.005	<0.001	***	0.903
No reason yet	-0.044	0.002	<0.001	***	0.957
Unauthorised other	-0.059	0.001	<0.001	***	0.943

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

Goodness of fit – AUC = 0.840

## B.5 Pupils achieving 5 GCSEs at grades A\*-C at the end of KS4

Model 1:	Achieving 5 A*-C at the end of KS4				
	Coefficient	Std. Error	p value		Odds ratio
Constant	-7.030	0.281	<0.001	***	0.001
<b>Prior attainment</b>					
Prior attainment (KS2 point score)	0.130	0.001	<0.001	***	1.139
<b>Ethnic group</b>					
White - British					Reference group
White - Irish	0.644	0.071	<0.001	***	1.903
White - Traveller of Irish heritage	-0.287	0.305	0.347		0.751
White - Gypsy/ Roma	-0.751	0.132	<0.001	***	0.472
White - Any other White	1.015	0.027	<0.001	***	2.760
Mixed - White and Asian	0.741	0.047	<0.001	***	2.097
Mixed - White and Black African	0.585	0.061	<0.001	***	1.795
Mixed - White and Black Caribbean	0.006	0.031	0.843		1.006
Mixed - Any other Mixed	0.616	0.035	<0.001	***	1.851
Asian - Bangladeshi	0.454	0.036	<0.001	***	1.574
Asian - Indian	0.859	0.032	<0.001	***	2.362
Asian - Any other Asian	1.034	0.041	<0.001	***	2.812
Asian - Pakistani	0.078	0.025	0.002	**	1.081
Black - Black African	0.632	0.027	<0.001	***	1.880
Black - Black Caribbean	-0.037	0.030	0.223		0.964
Black - Any other Black	0.244	0.051	<0.001	***	1.276
Chinese - Chinese	2.137	0.100	<0.001	***	8.471
Any other ethnic group	1.023	0.041	<0.001	***	2.780
Not obtained	0.320	0.061	<0.001	***	1.377
Refused	0.408	0.054	<0.001	***	1.504
<b>First Language</b>					
English					Reference group
Other than English	0.125	0.020	<0.001	***	1.133
Unclassified	-0.293	0.087	0.001	***	0.746
<b>SEN provision</b>					
No SEN					Reference group
School action	-1.311	0.011	<0.001	***	0.270
School action plus	-1.349	0.016	<0.001	***	0.259
Statement of SEN	-1.562	0.027	<0.001	***	0.210
<b>FSM eligibility</b>					
Not eligible					Reference group
Eligible for and claiming	-0.665	0.011	<0.001	***	0.514
<b>Gender</b>					
Girl					Reference group
Boy	-0.634	0.008	<0.001	***	0.530
<b>Absence information</b>					
Possible sessions across KS4	0.009	0.000	<0.001	***	1.009
Overall absence sessions across KS4	-0.019	0.000	<0.001	***	0.981

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

Goodness of fit – AUC = 0.853

Model 2:		Achieving 5 A*-C at the end of KS4			
	Coefficient	Std. Error	p value		Odds ratio
Constant	-6.576	0.285	<0.001	***	0.001
<b>Prior attainment</b>					
Prior attainment (KS2 point score)	0.128	0.001	<0.001	***	1.137
<b>Ethnic group</b>					
White - British				Reference group	
White - Irish	0.642	0.073	<0.001	***	1.901
White - Traveller of Irish heritage	-0.147	0.309	0.636		0.864
White - Gypsy/ Roma	-0.638	0.135	<0.001	***	0.528
White - Any other White	1.059	0.027	<0.001	***	2.882
Mixed - White and Asian	0.763	0.047	<0.001	***	2.144
Mixed - White and Black African	0.656	0.062	<0.001	***	1.926
Mixed - White and Black Caribbean	0.101	0.032	0.002	**	1.106
Mixed - Any other Mixed	0.664	0.036	<0.001	***	1.943
Asian - Bangladeshi	0.544	0.038	<0.001	***	1.722
Asian - Indian	0.854	0.033	<0.001	***	2.348
Asian - Any other Asian	1.062	0.041	<0.001	***	2.891
Asian - Pakistani	0.175	0.028	<0.001	***	1.191
Black - Black African	0.745	0.028	<0.001	***	2.107
Black - Black Caribbean	0.091	0.031	0.003	**	1.095
Black - Any other Black	0.360	0.052	<0.001	***	1.433
Chinese - Chinese	2.093	0.100	<0.001	***	8.110
Any other ethnic group	1.107	0.041	<0.001	***	3.027
Not obtained	0.157	0.062	0.012	*	1.170
Refused	0.428	0.055	<0.001	***	1.534
<b>First Language</b>					
English				Reference group	
Other than English	0.157	0.021	<0.001	***	1.170
Unclassified	-0.214	0.088	0.015	*	0.808
<b>SEN provision</b>					
No SEN				Reference group	
School action	-1.297	0.011	<0.001	***	0.273
School action plus	-1.302	0.016	<0.001	***	0.272
Statement of SEN	-1.593	0.028	<0.001	***	0.203
<b>FSM eligibility</b>					
Not eligible				Reference group	
Eligible for and claiming	-0.570	0.011	<0.001	***	0.566
<b>Gender</b>					
Girl				Reference group	
Boy	-0.598	0.008	<0.001	***	0.550
<b>Absence information</b>					
Possible sessions across KS4	0.008	0.000	<0.001	***	1.008
Illness	-0.014	0.000	<0.001	***	0.986
Medical appointment	-0.006	0.001	<0.001	***	0.994
Religious observance	-0.041	0.005	<0.001	***	0.960
Study leave	0.041	0.001	<0.001	***	1.042
Traveller	-0.007	0.002	0.001	***	0.993
Authorised holidays	-0.011	0.001	<0.001	***	0.989
Excluded	-0.113	0.002	<0.001	***	0.893
Authorised other	-0.021	0.001	<0.001	***	0.980
Unauthorised holidays	-0.029	0.001	<0.001	***	0.972
Late	-0.038	0.002	<0.001	***	0.962
No reason yet	-0.034	0.001	<0.001	***	0.967
Unauthorised other	-0.028	0.000	<0.001	***	0.973

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

Goodness of fit – AUC = 0.860



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