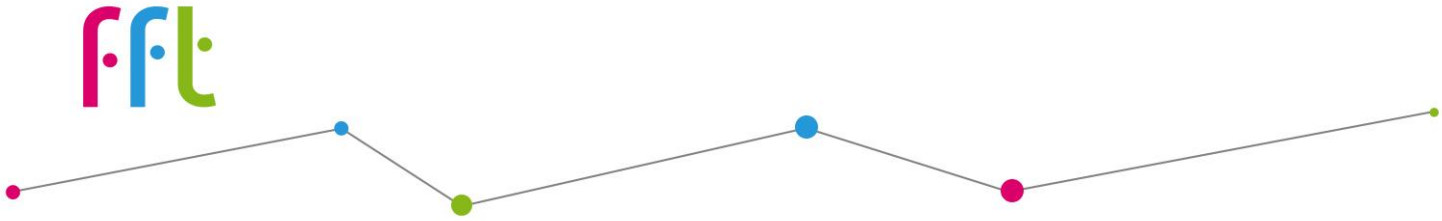
June 2014



Pupil Premium and the invisible group

Dr Mike Treadaway : June 2014

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Introduction

Closing the attainment gap between disadvantaged and other pupils is a high priority in both England and Wales. Specific funding is provided to schools – Pupil Premium (England) and Pupil Deprivation Grant (Wales).

In England funding is provided for pupils who, on the national school census return (collected termly since 2006/07), are recorded as having claimed Free School Meals (FSM) at any point in the last 6 years (FSM6). In Wales the funding is based upon pupils recorded as FSM in the most recent school census data (collected annually).

This paper examines difference within the FSM6 group in England and also considers pupils who have been FSM at some point in the past but not in the last 6 years. The outcomes are relevant to both England and Wales in that they identify variations which both schools, policy makers and inspectors should take into account when evaluating the impact of initiatives to 'close the gap'.

Further work in this area, to be published in autumn 2014, will look at this in more detail and will include aspects such as trends over time and differences within the 'ethnic minority' grouping used in this paper.

This paper includes the following sections:

- Summary of Findings and Recommendations
- Pupil Premium Groups
- Methodology
- Outcomes
- Implications for Evaluation and Target Setting
- The Invisible Group
- Appendix (Other Indicators)

Summary of findings

Pupil premium (PP) includes pupils with different patterns of FSM 'entitlement', from pupils who have been FSM just once during the last 6 years to those who have been FSM on all occasions in their school census records.

We find clear and significant differences between both attainment and progress (value-added) for pupil premium pupils with different characteristics. To illustrate this we have identified 4 groupings:

- Pupils FSM for the first 2 years only of the 6 year PP period.
- Pupils for the last 2 years only.
- Pupils FSM for all 6 years.
- Any other pattern.

We have also identified another important group. Particularly for secondary schools. These are pupils who have been FSM at some point but not in the last 6 years. Their attainment and progress is much closer to that of PP pupils than it is to those who have never been FSM.

We call this group 'EverNot6' and they are an 'invisible' group because they are not included in PP funding and are unlikely to be known to schools. In 2013 the KS4 (Y11) cohort in England included over 38,000 such pupils. In Wales, where only the pupils' most recent FSM status is used, then number in this 'invisible' group will be significantly larger.

We have also found that the proportion of time for which a pupil is FSM throughout their time in school is likely to be the best indicator of the potential impact of disadvantage upon attainment and progress.

It is important to emphasise that the groupings identified each represent the average of a large number of pupils. Individuals and their circumstances vary and there are many, but not yet enough, disadvantaged pupils who make good progress.

As with any other data, information such as that presented here should be taken as a starting point for discussion and an indication of potential need for support.

Recommendations

DfE, Welsh Government and other Policy Makers:

- Consider the 'invisible' group and whether they should be identified and supported by basing Pupil Premium funding upon on 'FSM Ever' instead of FSM6.
- Consider whether the percentage of times that each pupil has been FSM throughout their time in schools should be taken into account, perhaps through additional funding based upon the proportion of pupils with a high % of FSM records in their census data.
- Consider whether initiatives to provide free school meals for all pupils will impact upon the reliability of FSM as an indicator of deprivation.

Ofsted and OHMCI:

- Provide inspection teams with guidance and training which enables them to better evaluate a school's progress towards closing the gap.
- Emphasise, in this guidance, the need to consider both attainment and value-added and, if available, the impact of variations (ethnicity, length of time FSM) within the pupil premium group.

Schools, Local Authorities, Academy Chains and other agencies:

- Take into account the 'mix' of pupil premium pupils when evaluating impact and when targeting resources for pupil premium pupils.
- Consider whether pupils who have previously been FSM but are not FSM6 are in need of additional support.
- Pay particular attention to the needs of pupils who have never previously been entitled to FSM but becomes so during the final two years of a key stage.

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- Consider whether any change to pupil groupings (e.g. bands based on % of total census records with FSM status) might be appropriate.
- Develop analyses and reports which take account of this research and which enable schools to better identify and prioritise the support needs of pupil premium pupils.
- Undertake further research to look at trends over time, variations between different ethnic minority groups variations between regions and between schools.

Pupil Premium Groups

The analyses shown in this paper are based upon a hypothesis that there might be differences within the pupil premium group. Would the average attainment and progress pupils who, for example, were FSM in Y6 and never since then be similar to that of pupils who were FSM all 6 years?

So far, we have looked at:

- Pupils in Y6 (at the end of Key Stage 2)
- Pupils in Y11 (at the end of KS4)

After some initial investigations 4 groups were used for subsequent analysis.

Group	KS2	KS4
A	FSM in Y1 or Y2 and never since	FSM in Y6 or Y7 and never since
B	FSM in Y5 or Y6 and never before	FSM in Y10 or Y11 and never before
C	FSM in all years (Y1 to Y6)	FSM in all years (Y6 to Y11)
D	Any other pattern	Any other pattern

Methodology

For each of these groups we have looked at:

- Prior attainment
- Attainment at end of Key Stage
- Value-Added (KS1->KS2 and KS2->KS4)

For value-added we have used the FFT 'PA' model. Input factors in this model are KS1 (for KS1->KS2 models) and KS2 attainment (for KS2->KS4 models), gender and age:

- For KS2 we use fine grades (calculated from test marks). We also take account, within KS2 data, of variations in attainment between subjects and also any differences between tests and teacher assessments.
- For KS1 we use teacher assessment data. We calculate, from overall levels and from sublevels within level 2, attainment for each subject and overall attainment. We use scores based upon analysis of distributions.

Indicators used are:

KS2 Attainment:

- Overall Attainment (average level in English, mathematics and science)
- Expected Progress in English
- Expected Progress in mathematics

KS4 Attainment:

- 5A*C (including English and Mathematics) (includes equivalences)
- Average GCSE Grade (GCSE subjects only)
- Expected Progress in English
- Expected Progress in mathematics

In this report we focus mainly on KS2 overall attainment and KS4 average GCSE grade. This is because measures like these provide the most accurate basis for comparing the attainment and progress of all pupils. Tables in the Appendix show data for other indicators.

We consider 'Expected Progress' indicators to be essentially measures of attainment and, as such, perform a value-added calculation using FFT methodology. We do this because expected progress varies by prior-attainment with a smaller percentage of pupils having low KS2 attainment making expected progress when compared with those having high KS2 attainment. For this reason we regard expected progress as an attainment measure. Because the value-added calculation takes into account factors such as KS2 fine grades the value-added scores (residuals) are not biased in respect of KS2 attainment.

For average GCSE grade calculations we use a 0...8 scale
(0 for ungraded, 1 for G, 2 for F through to 8 for A*).

We show outcomes for ethnic minority pupils separately. This is because there are significant differences between such pupils and others. A more detailed paper will examine differences within the overall ethnic minority grouping. In the subsequent sections we use the following terms:

- White
    - Includes pupils who, in school census data, are categorised as White British.
- Ethnic Minority
    - All other ethnicity groups within the school census data, excluding 'Information Not Obtained' and 'Refused'.

Outcomes

When evaluating progress towards 'closing the gap' it is important that we look at two aspects:

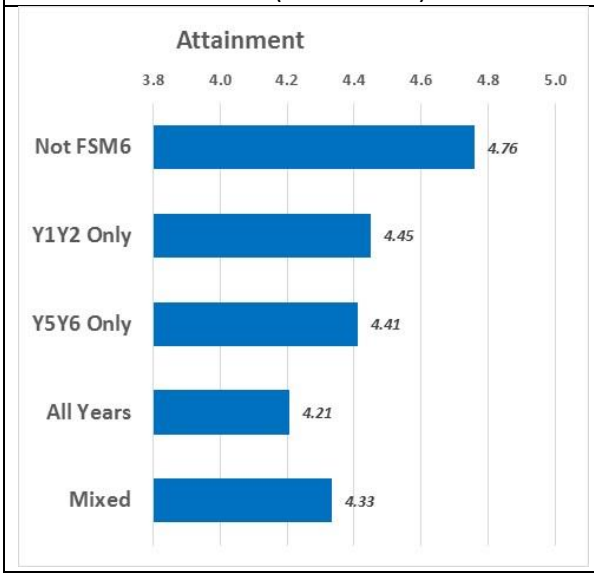
- Differences in attainment
- Differences in progress (value-added)

It is important to do this when making comparisons, such as those between schools or of the impact of interventions, because a similar 'gap' could arise from two very different situations:

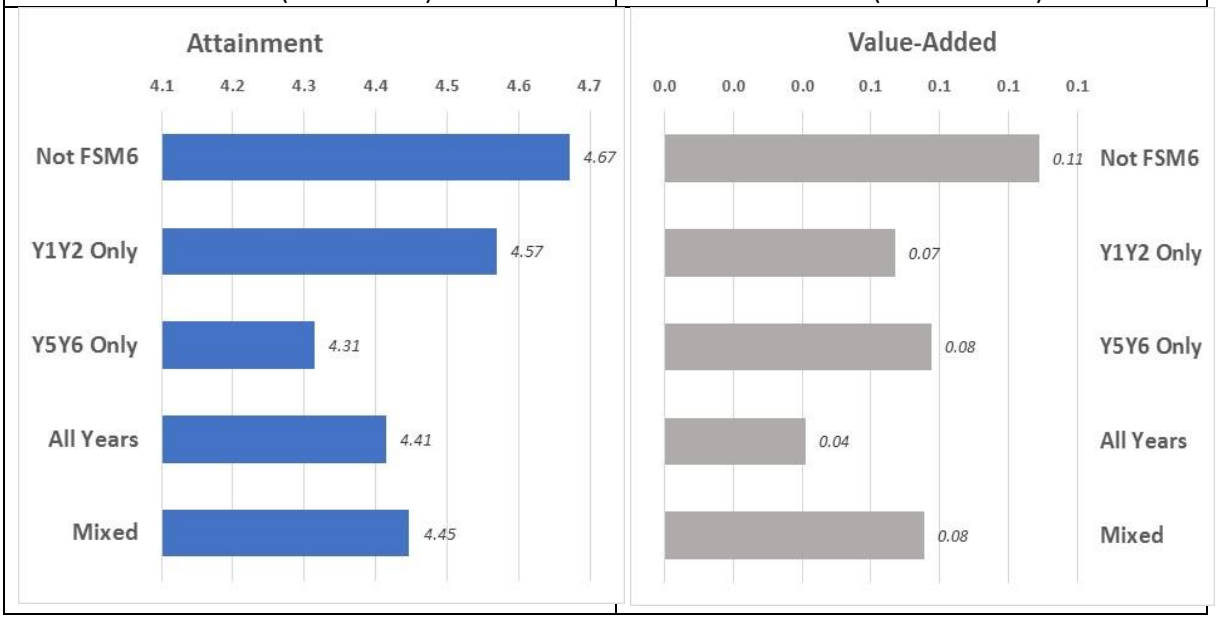
- FSM6 pupils have similar prior-attainment to other pupils but they make less progress.
- FSM6 pupils have lower prior-attainment than other pupils but make better progress.

Charts 1 and 2 show attainment, estimate and value-added (using the FFT PA model) for KS2 outcomes using overall attainment in English, mathematics and science (calculated using fine grades from test marks where available).

KS2 average attainment across English, mathematics and science	
White Pupils	
Chart 1 (Attainment)	Chart 2 (Value-Added)



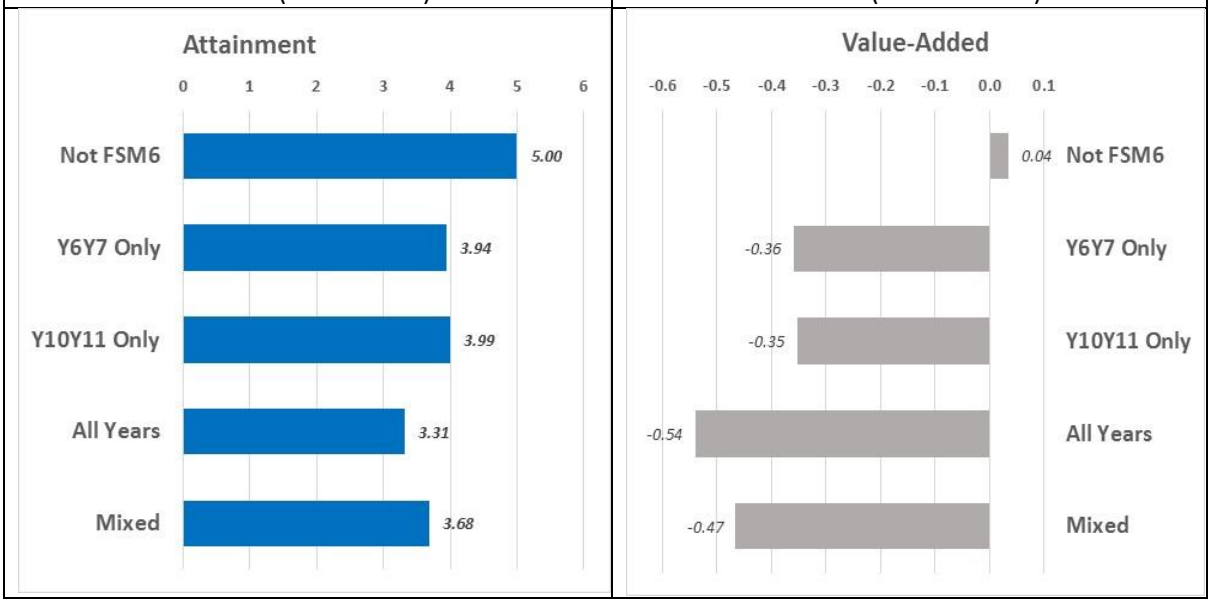
KS2 average attainment across English, mathematics and science	
Ethnic Minority Pupils	
Chart 3 (Attainment)	Chart 4 (Value-Added)



Pupils in the four FSM6 groups have lower attainment and lower value-added scores when compared to pupils who are not in the FSM6 group. For ethnic minority pupils, when compared to the same group for white pupils, attainment is lower but value-added higher.

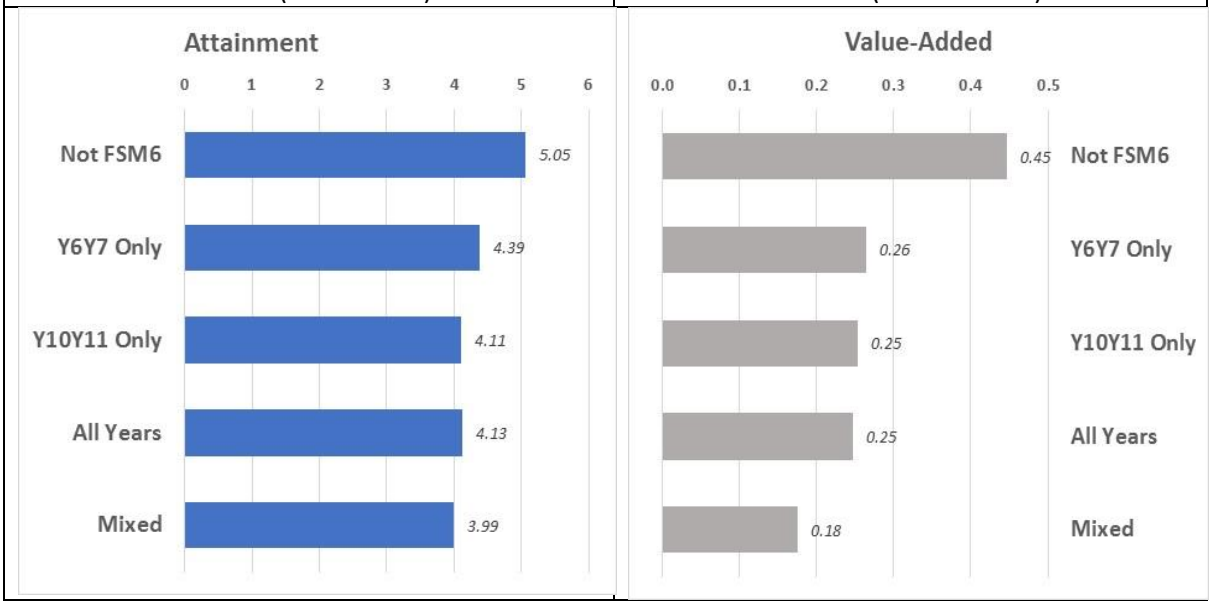
Charts 5 and 6 show attainment, value-added (FFT PA model) for KS4 outcomes using average GCSE grade.

KS4 average GCSE grade	
White Pupils	
Chart 5 (Attainment)	Chart 6 (Value-Added)



Charts 7 and 8 show KS4 outcomes for ethnic minority pupils.

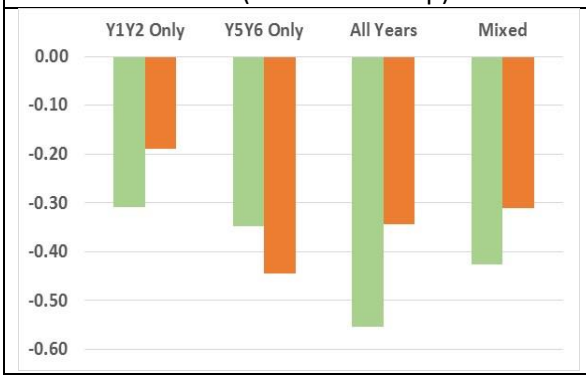
KS4 average GCSE grade	
Ethnic Minority Pupils	
Chart 7 (Attainment)	Chart 8 (Value-Added)



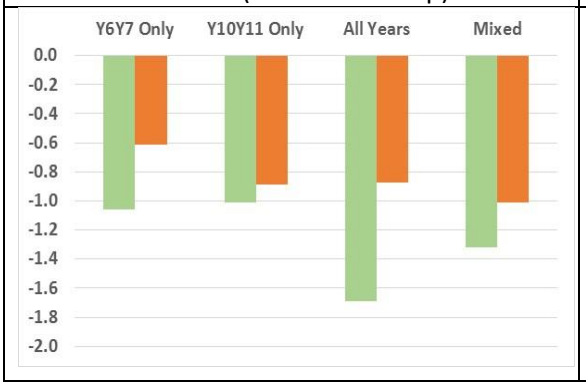
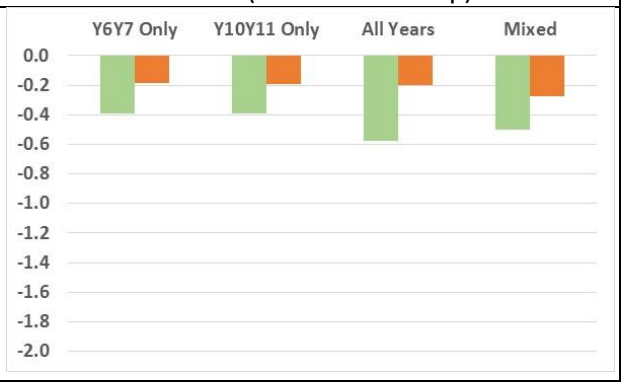
Patterns at KS4 are similar to those at KS2 with pupils in each of the FSM6 groups having lower attainment and lower value-added when compared to pupils not in the FSM6 group. For ethnic minority pupils attainment is again lower and value-added higher when compared to white pupils in the same group.

We can look a differences in terms of the gap between each FSM6 group and pupils who are not FSM6. Charts 9 and 10 show the gaps for attainment and for value-added at KS2. To enable comparison, the scale for the attainment and value-added charts is the same within each key stage.

- The attainment gap represents the difference between the attainment of each FSM6 group and non-FSM pupils. A gap of -0.5 indicates that the group has attainment of half a level (KS2) or half a grade (KS4) lower than non-FSM6 pupils.
- The value-added gap represents the difference between the value-added score for FSM6 pupils and that for pupils who are not FSM6. A value of zero would mean that, on average, both groups were making the same progress.

KS2 average attainment across English, mathematics and science	
Gap between each FSM6 group and non-FSM6 group	
Chart 9 (Attainment Gap)	Chart 10 (Value-Added Gap)
	

Charts 11 and 12 show the gaps at KS4.

KS4 average GCSE grade	
Gap between each FSM6 group and non-FSM6 group	
Chart 11 (Attainment Gap)	Chart 12 (Value-Added Gap)
	

	White Pupils		Ethnic Minority Pupils

Gaps in value-added are lower than those in attainment. This is because differences in attainment at the start of account for a substantial proportion of the differences at the end of each key stage.

Gaps for ethnic minority pupils, apart from attainment for the 'Y56 Only' group at KS2, are lower than for white pupils but there differences between FSM6 groups:

- For white pupils the 'All Years' group has a larger gap than for other groups in attainment (KS2) and both attainment and value-added (KS4)
- Becoming FSM in the last 2 years of the key stage looks, relative to other groups, to have more impact at KS2 than at KS4.

Implications for Evaluation and Target Setting

What impact might this have upon evaluation and target setting? The differences between groups within FSM6 would not have any impact upon overall school gaps if the distribution of groups within FSM6 was consistent across schools.

This is, however, not the case. Tables 1 shows the national percentage of FSM6 pupils in each group and the variation between schools (lowest and highest values):

Table 1	**Key Stage 2**			**Key Stage 4**		
Group	**National**	**School (Min)**	**School (Max)**	**National**	**School (Min)**	**School (Max)**
A (First 2 Years)	10%	0%	86%	13%	1%	36%
B (Last 2 Years)	13%	0%	91%	9%	1%	42%
C All Years	27%	0%	81%	33%	8%	70%
D Mixed	50%	5%	90%	45%	19%	73%

Why does this have implications for evaluation?

Table 2 shows two secondary schools with the same overall attainment gap (for % of pupils attaining C or higher in English and mathematics) between pupil premium pupils and other pupils. The national gap is shown and a modified figure which shows what the national gap would be if differences between the groups within pupil premium was taken into account.

					Attainment		Gap		
School	A	B	C	D	PP	Not PP	School	National	Adjusted
School 1	40%	10%	20%	30%	32%	60%	-28%	-28%	-24%
School 2	5%	5%	70%	35%	32%	60%	-28%	-28%	-31%

In both cases the school's gap is the same as is found nationally. However, when we adjust for the balance between groups within pupil premium:

- School 1 would, if it followed the national pattern for each group, have a gap of 24%. The school's actual gap, at 28%, is 4% worse.
- School 2 would, if it followed the national pattern for each group, have a gap of 31%. The school's actual gap, at 28%, is 3% better.
- So, for two schools which look to have the same gap as we find nationally, there is a difference of 7% between them when we take into account the distribution of groups within pupil premium.

Given the differences between white and ethnic minority pupils it could also be important to take this into account when evaluating a school's gap against national patterns. This will be explored further in a more detailed paper (to be published in autumn 2014).

When thinking about improvement, targets and pupil support in relation to pupil premium schools might find it helpful to consider the findings of this research. This not to say that schools should reduce expectations for, say, a pupil who have been FSM in all 6 years. Individuals vary and the outcomes shown in this research are the average for pupils with similar characteristics. With this 'health warning' in mind schools should consider questions such as:

- If we have a group of Y10 pupils who have been FSM for every year since Y6 will they need, on average, more support than a group of pupils who have been FSM in Y6 but never since?
- If pupils who have never been FSM previously become entitled in Y10 or Y11 should we regard this as an alert which promotes further consideration of their support needs?

At present it is difficult for schools to do this because they do not have analyses or reports enabling them to evaluate the different groups or to identify the 'FSM history' of individual pupils.

The Invisible Group

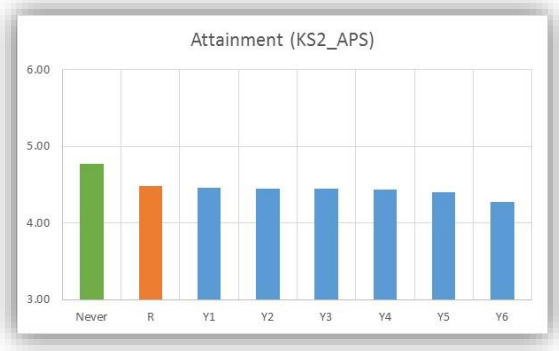
When looking at patterns of FSM across years we noticed that there were a substantial number of pupils who were not pupil premium but who had, at some point, been FSM. We call this group 'Ever not 6' and they are defined as:

- For the Y11 cohort in secondary schools, pupils who have been FSM prior to being in Y6 but have not been FSM from Y6 onwards.
- For the Y6 cohort in primary schools, pupils who have been FSM in Reception but have not been FSM from Y1 onwards.

It should be noted that the DfE calculation of FSM6 is based upon the spring (January) school census. This means that pupils in Y11 will be FSM6 if they have been FSM in any school census between summer in Y5 and spring in Y11. Similarly, FSM6 at the end of KS2 will include pupils FSM in any census between summer in Reception and spring in Y6. Applying these calculations make only a very small difference to numbers in the 'invisible' group.

Charts 13 and 14 show the attainment and progress (from KS1 to KS2) of pupils who were pupil premium in the national Y6 cohort for 2012/13. The charts show both attainment and progress for:

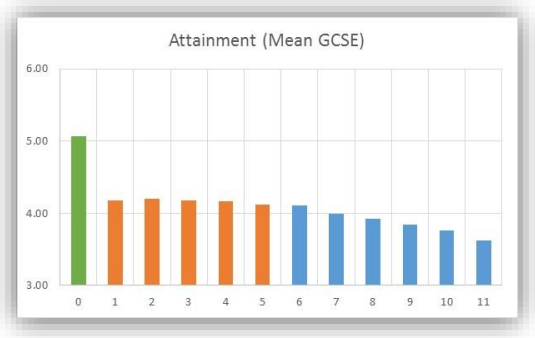
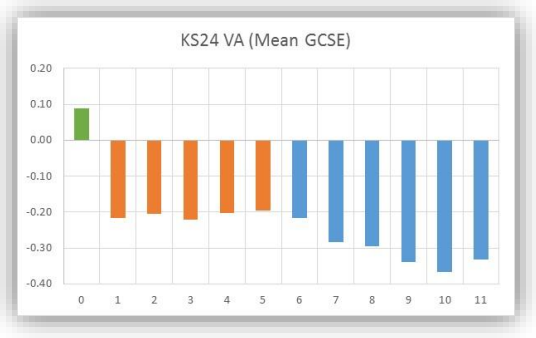
- Pupil Premium Pupils (Y1 to Y6)
- Pupils who were FSM in Reception
- Pupils who have never been FSM

KS2 average attainment across English, mathematics and science	
Chart 13 (Attainment)	Chart 14 (Value-Added)
	

	Never FSM		Ever Not 6		FSM6

Charts 15 and 16 show the attainment and progress (from KS2 to KS4) of pupils who were pupil premium in the national Y11 cohort for 2012/13. The charts show both attainment and progress for:

- Pupil Premium Pupils (Y6 to Y11)
- Pupils who have been FSM but were not Pupil Premium in Y11 (Y1 to Y5)
- Pupils who have never been FSM

KS4 Average GCSE Grade	
Chart 15 (Attainment)	Chart 16 (Value-Added)
	

In both cases the attainment and progress of the 'Ever not 6' is much closer to that of pupil premium pupils than it is to those who have never been FSM. This 'lasting' impact of FSM applies even for pupils who have been FSM in Y1 but never since – their attainment at KS4 and progress from KS2 to KS4 is the same as pupils who were FSM in Y6 and never since.

In 2012/13 the 'Ever not 6' group included around 38,000 pupils in Y11 and 5,500 pupils in Y6. Numbers in Y6 are much lower because they represent pupils who were FSM in R (Reception) but never since whereas those for Y11 represent pupils who were FSM in any of years 1 to 5 but never since.

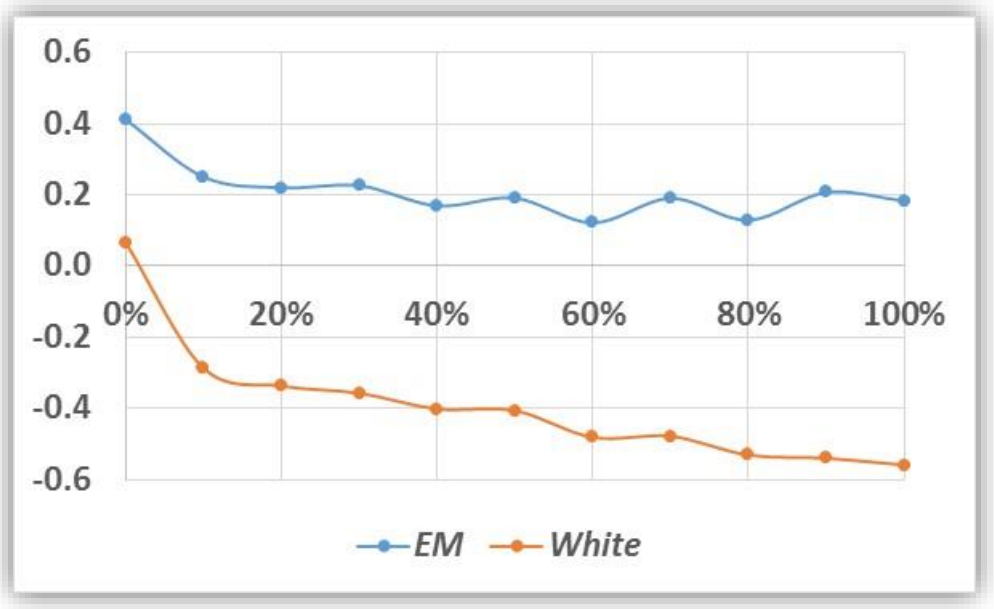
We call the 'Ever not 6' group an invisible group because:

- They did not qualify for pupil premium funding in Y11
- They will be counted as 'not pupil premium' in analyses which look at gaps when they should really be counted in the 'pupil premium' group
- Secondary schools are likely to find it difficult to identify these pupils

Whilst, in the longer term, schools will have had pupil premium support for pupils in the 'Ever not 6' group in the years when they were FSM this does not take away from the fact that there are a significant number of pupils currently in the latter stages of secondary education who have not had such support. It also highlights the need for schools to pay particular attention to the needs of pupils who have never been FSM but become eligible in the final two years of each key stage.

Further investigations have shown that the best indicator of disadvantage that can be developed using FSM would be the percentage of times that a pupil has been FSM throughout their time in schools. For example, a pupil who has 12 records in school census and has been FSM for 6 of these would have a figure of 50%. Chart 15 shows, for KS4, how the progress (value-added) varies in relation to pupils '% of times FSM' figure.

KS2 to KS4 Value-Added (Mean GCSE Grade) variation with % times pupil is FSM



The horizontal axis shows the % of times which a pupil has been FSM in their time in school. For pupils in Y11 in 2012/13 this could be up to 24 times if they had records in every census return from Y1 to Y11 (some early census data was collected only annually).

This chart shows that:

- There is a relatively large drop in value-added going from pupils who have never been FSM (0%) to those who have been FSM for around 1 in 10 (10%) occasions.
- For pupils with 10% or more FSM value-added decreases fairly steadily as %FSM increases.
- For ethnic minority pupils the impact of disadvantage is lower and the decrease with increasing %FSM is much lower.

Within, for example, group C (FSM in all 6 years of FSM6) there are some pupils with 33% of records (6 out of 18) as FSM whereas others are 100% (18 out of 18). There may, therefore, be a case for grouping by % of times FSM rather than by combinations based upon years.
Research into this and other indicators of disadvantage is ongoing.

Appendix (Other Indicators)

Tables here show, for each FSM group, the attainment and value-added for 4 indicators.

For KS2:

- Key Stage 1 average NC Level (KS1APS)
- Average NC Level (English, mathematics and science) (APS)
- English and mathematics level 4+ (EM4)
- Expected Progress in English (EN2L)
- Expected Progress in mathematics (MA2L)

Key stage 2	White Pupils								
	Attainment					Value-Added			
FSM Group	KS1APS	APS	EM4	EN2L	MA2L	APS	EM4	EN2L	MA2L
A (First 2 Years)	2.4	4.52	73%	88%	85%	-0.05	-1%	-2%	-2%
B (Last 2 Years)	2.4	4.47	71%	87%	83%	-0.07	-2%	-3%	-3%
C (All Years)	2.2	4.26	62%	85%	82%	-0.08	-3%	-3%	-2%
D (Mixed)	2.3	4.41	68%	87%	84%	-0.06	-2%	-2%	-2%
E (Ever Not 6)	2.4	4.52	74%	88%	85%	-0.05	-1%	-1%	-2%
N (Never FSM)	2.7	4.82	85%	90%	90%	0.00	0%	0%	0%

Key stage 2	Ethnic Minority Pupils								
	Attainment					Value-Added			
FSM Group	KS1APS	APS	EM4	EN2L	MA2L	APS	EM4	EN2L	MA2L
A (First 2 Years)	2.4	4.63	79%	91%	90%	0.05	3%	1%	3%
B (Last 2 Years)	2.4	4.60	78%	90%	90%	0.05	4%	1%	3%
C (All Years)	2.3	4.47	73%	90%	87%	0.03	4%	1%	2%
D (Mixed)	2.3	4.53	75%	91%	88%	0.06	4%	2%	2%
E (Ever Not 6)	2.5	4.63	81%	91%	89%	0.05	4%	2%	2%
N (Never FSM)	2.6	4.81	85%	92%	92%	0.09	3%	2%	3%

For KS4:

- Key Stage 2 average NC Level (KS2APS)
- Average GCSE Grade (APS)
- English and mathematics C+ (EMC+)
- Expected Progress in English (EN3L)
- Expected Progress in mathematics (MA3L)

Key stage 4	White Pupils								
	Attainment					Value-Added			
FSM Group	KS2APS	APS	EMC+	EN3L	MA3L	APS	EMC+	EN3L	MA3L
A (First 2 Years)	2.4	4.52	73%	88%	85%	-0.05	-1%	-2%	-2%
B (Last 2 Years)	2.4	4.47	71%	87%	83%	-0.07	-2%	-3%	-3%
C (All Years)	2.2	4.26	62%	85%	82%	-0.08	-3%	-3%	-2%
D (Mixed)	2.3	4.41	68%	87%	84%	-0.06	-2%	-2%	-2%
E (Ever Not 6)	2.4	4.52	74%	88%	85%	-0.05	-1%	-1%	-2%
N (Never FSM)	2.7	4.82	85%	90%	90%	0.00	0%	0%	0%

Key stage 4	Ethnic Minority Pupils								
	Attainment					Value-Added			
FSM Group	KS2APS	APS	EMC+	EN3L	MA3L	APS	EMC+	EN3L	MA3L
A (First 2 Years)	4.4	3.97	43%	57%	55%	-0.35	-8%	-9%	-9%
B (Last 2 Years)	4.4	3.96	43%	55%	54%	-0.35	-8%	-10%	-10%
C (All Years)	4.1	3.35	30%	45%	42%	-0.51	-10%	-14%	-13%
D (Mixed)	4.3	3.67	36%	51%	48%	-0.45	-9%	-12%	-12%
E (Ever Not 6)	4.4	4.06	45%	59%	56%	-0.32	-7%	-7%	-9%
N (Never FSM)	4.7	5.07	69%	75%	77%	0.07	1%	2%	2%