



# The impact of school closures on spring 2021 attainment

Mainstream state schools in England show declines in attainment across all years in reading, maths and GPS. By the end of spring 2021, year-on-year declines in attainment are higher than those previously seen at the end of autumn 2020.

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Katie Blainey, RS Assessment from Hodder Education

Timo Hannay, SchoolDash

## Summary

This paper analyses attainment among primary pupils in England after the third national lockdown and suspension of most in-person teaching from January to early to mid-March 2021. It uses aggregate results from 150,000 primary school tests from over 700 schools taken in late March 2021 before the Easter holidays, provided by RS Assessment from Hodder Education. These tests include Progress in Reading Assessment (PiRA), Progress in Understanding Mathematics Assessment (PUMA) and Progress in Grammar, Punctuation and Spelling Assessment (GAPS).

This interim paper follows on from the paper published in February 2021, *The impact of school closures on autumn 2020 attainment*.

### Key findings, spring 2021:

- There were substantial drops in attainment between spring 2020 and 2021 across all subjects and year groups, more than twice the size of the drops seen at the end of autumn 2020.
- Grammar, Punctuation and Spelling (GPS) and maths showed the largest declines, representing a gap of on average three months' progress across all year groups. Reading, on average, showed a two-month gap.
- Younger year groups, Years 1 and 2 in particular, generally showed bigger reductions in attainment than older year groups.
- Children attending schools in more deprived areas, and schools with higher proportions of children receiving free school meals, tended to show greater declines in attainment than their peers. Schools with a high percentage of children eligible for Free School Meals (FSM) experienced decreases in scores approximately twice as severe as schools with a low percentage of FSM eligible children.
- During the spring term, regional differences showed no consistent patterns across all year groups and subjects. This was in contrast to our previous findings at the end of the autumn term.

Professor Simon Burgess, University of Bristol

*"The headline finding is very striking: that the year-on-year fall in attainment to spring 2021 is greater than that at the end of autumn term 2020. Whilst some anecdotal evidence suggested that the most recent school closure period had been more successful in terms of learning, these attainment data suggest some caution in accepting that."*

# Introduction

## A summary of prior analysis in 2020–2021

Our most recent analysis<sup>1</sup>, published in February 2021, examined the impact of school closures on attainment by investigating the results of tests sat at the end of the 2020 autumn term. This was after a period of schools being open for a full term, albeit with considerable ongoing disruption in some areas. It compared the tests taken towards the end of the 2020 autumn term with the results obtained from the previous cohort in autumn 2019. There were decreases in attainment across virtually all subjects and year groups, typically in the range 0.5 to 2.0 Standardised Score points. In general, younger year groups were most affected, and GPS saw the biggest declines. Overall, this could amount to a gap of up to two months' learning between children in 2020 and 2019. Nevertheless, these reductions in attainment were about a fifth of that seen at the beginning of the autumn term, which were typically in the range of 5 to 10 Standardised Score points. This suggested that schools and pupils caught up considerably during the course of the autumn term, and while overall learning loss was by no means eliminated it was greatly reduced.

## Spring term analysis

In January 2021 schools in England were closed again for a significant period of time due to a national lockdown, only opening for children of key workers and vulnerable children. Primary schools were able to start opening their doors to all pupils from 8th March 2021, which gave schools either three or four weeks of teaching before the Easter holidays.

This paper analyses aggregate, anonymised results from tests sat by primary pupils at mainstream state schools in England and aims to give early insight into what impact the second period of school closures has had on attainment in reading, maths and GPS. It compares tests taken in spring 2020 up to the point when schools closed, with those taken towards the end of spring term 2021 after schools had re-opened but before the Easter holidays.

## Coverage and representativeness

This analysis is limited to mainstream state primary schools in England. To allow this interim analysis to be published in a timely manner, but also to ensure a like-for-like comparison could be drawn between 2021 and 2020, we prepared an extract of the test data just before Easter 2021. This meant that in practice not all schools had entered their data into MARK, and in many cases schools had decided to move their testing window to after the Easter holidays. The result is a smaller sample of schools in the 2021 cohort than 2020: in maths this reduced from 645 to 357 and in reading from 715 to 400, though in GPS it increased from 333 to 424. In order for us to have confidence in our statistical analysis it is vital we have a large and representative enough sample, which this gave us, as we consequently had a minimum of 5,000 test results per test and an average of 8,500. The 2020 cohort had on average 12,000 per test with a minimum of 3,300 per test.

An analysis of the coverage of types of schools included in both cohorts was broadly similar in that all regions and major school types were included. However, in both years there was an over-representation of schools in the lowest attainment bands, which is to say, schools with lower-than-average proportions of Key Stage 2 children achieving the expected standard in reading, maths and writing in the National Tests in 2019. However, the similar levels of over-representation in both groups mean that this bias is unlikely to account for the year-on-year differences in attainment.

<sup>1</sup> See [risingstars-uk.com/whitepaper](https://risingstars-uk.com/whitepaper) for these previous analyses.

## Overall changes in attainment

As shown in Figure 1, there were decreases in attainment from 2020 to 2021 across every subject and year group, with larger declines than seen at the end of the preceding autumn term. Across all subjects, children in Years 1 and 2 were affected most.

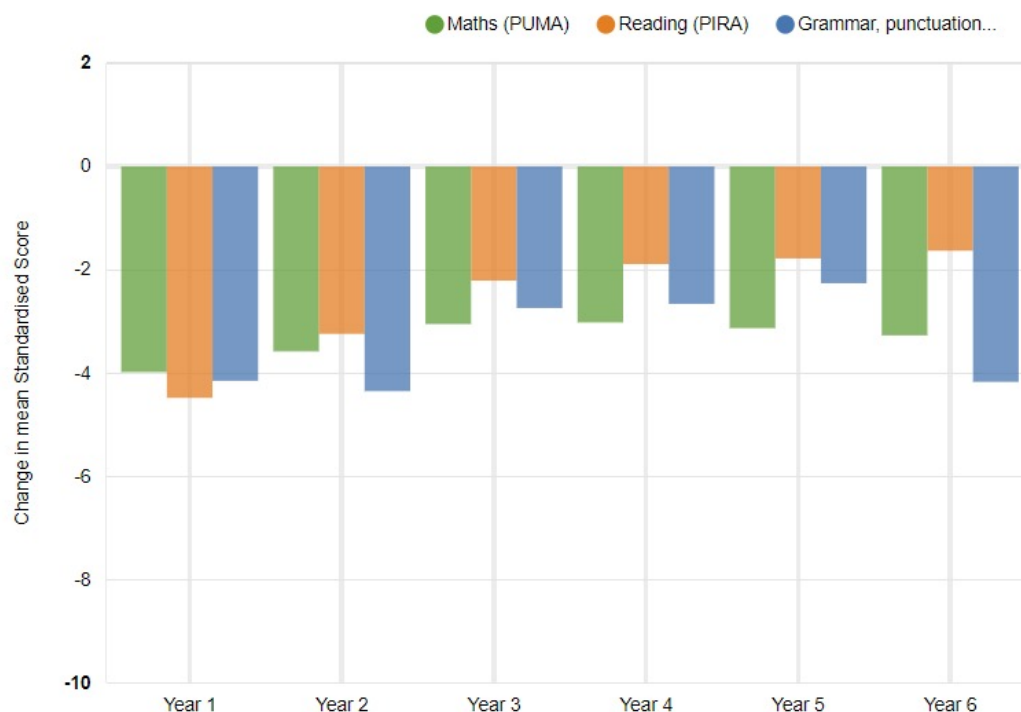
In reading the average drop in the autumn 2020 term across all years was 0.5 Standardised Score points, in spring 2021 it was 2.5 points, which could amount to an average of up to two months' learning. The most affected year groups in reading were once again the youngest, with Year 1 children showing the largest decline, which is consistent with the autumn 2020 results.

Maths, in autumn 2020, saw an overall drop of 0.9 points across all years, increasing in spring 2021 to 3.3 points. This corresponds to up to three months' learning. Children in Key Stage 1 were most affected, but the pattern was fairly consistent across all Key Stage 2 year groups, which is in contrast to our previous results for the autumn term.

The declines in GPS in autumn 2020 were an average of 1.7 points, but 3.4 points in spring 2021. The most affected year groups were 1, 2 and 6.

The estimates of months' learning loss quoted above were calculated using a method<sup>2</sup> developed by the Education Endowment Foundation (EEF) that translates effect sizes to months of learning. They should be treated with caution and are no more than a rough indicative guide.

**Figure 1: Change in mean Standardised Scores from spring 2020 to spring 2021**



Sources: MARK, SchoolDash analysis.

2021 sample sizes: In the range 45,000–59,000 tests per subject and 5,000–12,400 per subject-year group combination.

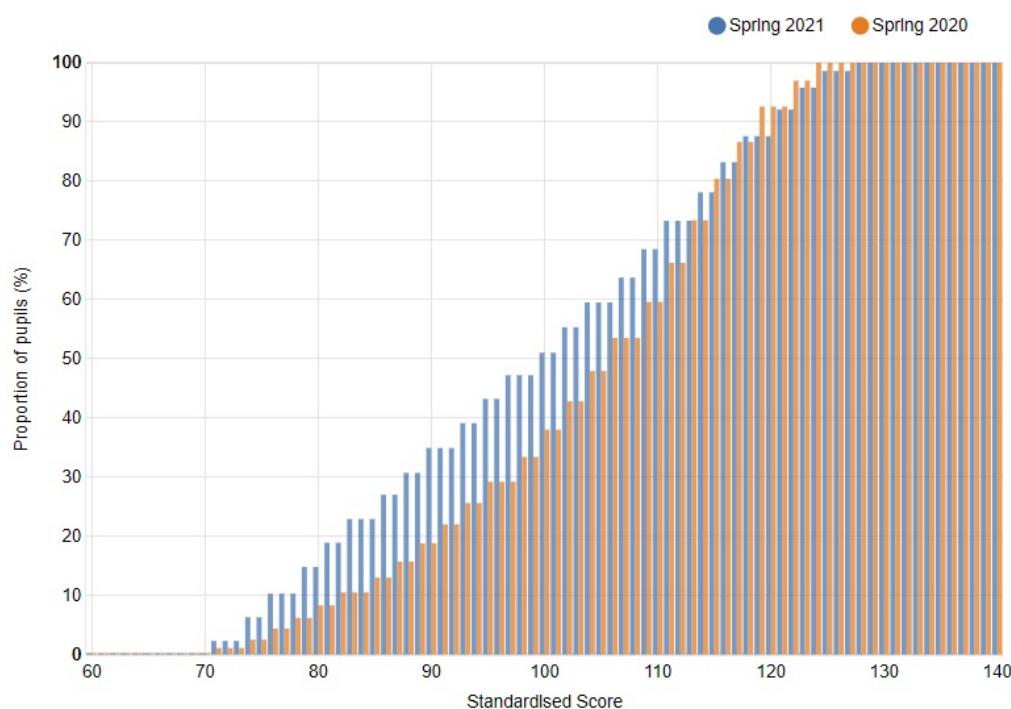
<sup>2</sup> Effect sizes were calculated by dividing the difference in Standardised Score points between 2020 and 2021 cohorts by the standard deviation of the 2020 cohort. These were converted to months using the EEF table, see: [educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits/attainment](https://educationendowmentfoundation.org.uk/evidence-summaries/about-the-toolkits/attainment)

## Attainment distribution

As well as looking at the changes in mean score, it is also important to examine if the distributions of scores were altered since this may indicate whether certain groups of pupils were affected more than others.

Figures 2, 3 and 4 show the cumulative distribution of scores for the Year 1 spring term papers for each subject, comparing 2020 (orange columns) to the 2021 (blue columns). This allows us to see whether the change in scores was distributed evenly across the attainment range. The pattern is most stark for Year 1 reading (Figure 2) in which pupils at the lower end of the scale were disproportionately affected. In contrast, maths and GPS both show 2020 and 2021 distributions with a similar shape, which is consistent with the idea that declines in performance were relatively evenly spread across the attainment range. As we shall see below, however, this does not necessarily mean that all pupils were equally affected.

**Figure 2: Distributions of Standardised Scores for Spring Year 1 test in Reading**



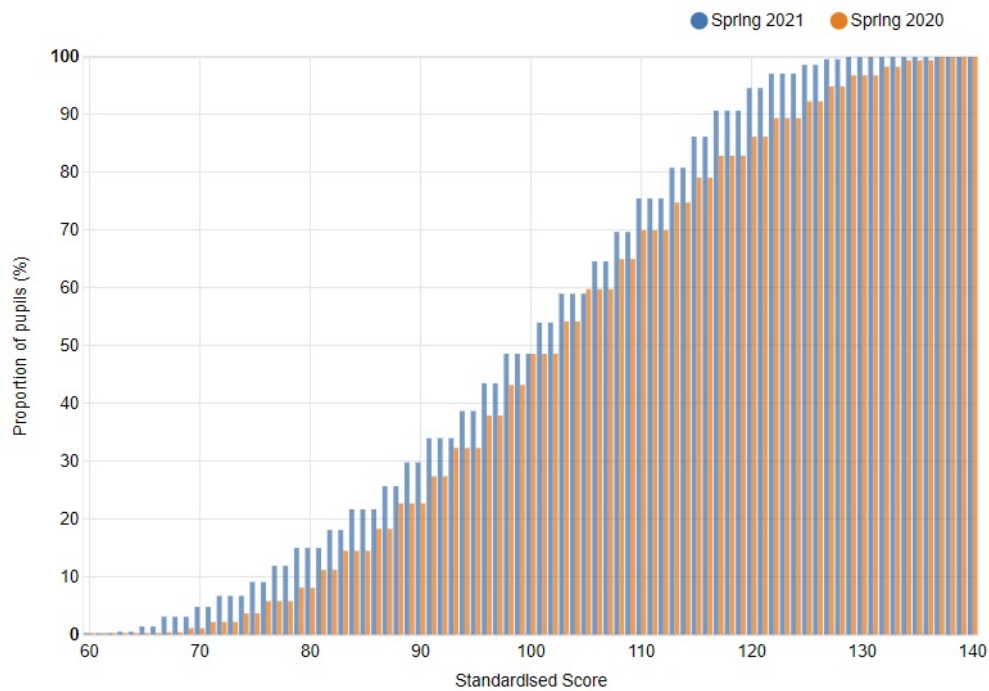
Sources: MARK, SchoolDash analysis.

Sample size: Approximately 14,000 tests in 2020 and 7000 in 2021

Matthew Wynne, Primary Regional Director, United Learning

***“The timing of the PiRA/PUMA tests was a difficult decision to make. We decided to test pupils prior to the Easter break in order that we have a clear indicator as to the impact of remote learning. In a number of schools children took several weeks to re-establish social groupings and relationships, particularly in settings where a larger proportion of children were attending remotely. This may have negatively impacted upon their test scores.”***

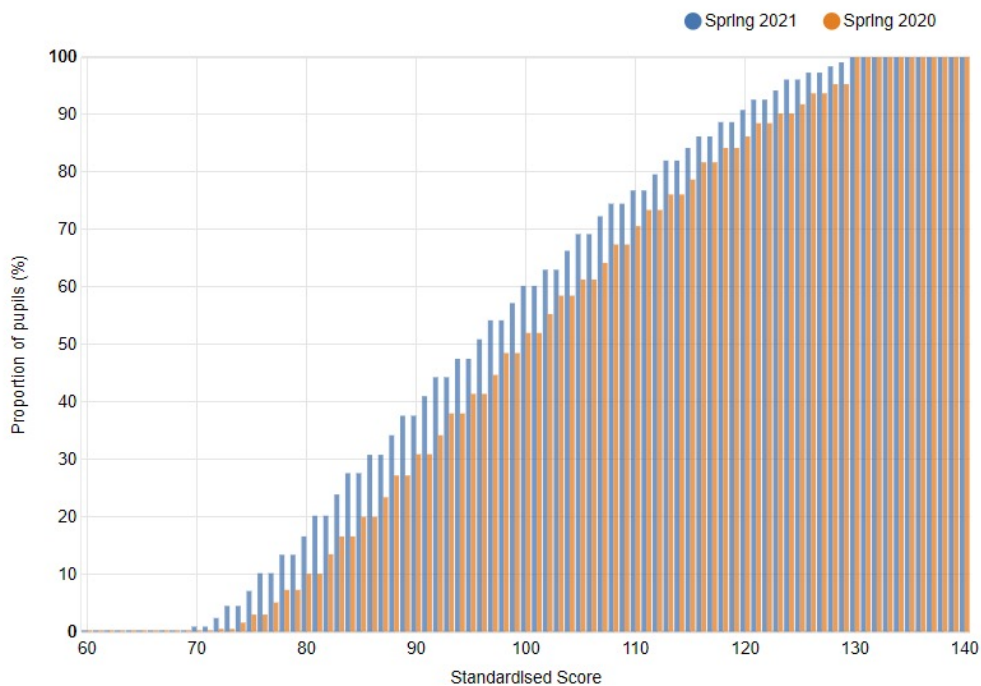
**Figure 3: Distributions of Standardised Scores for Spring Year 1 test in Maths**



Sources: MARK, SchoolDash analysis.

Sample size: Approximately 14,000 tests in 2020 and 6000 in 2021

**Figure 4: Distributions of Standardised Scores for Spring Year 1 test in GPS**

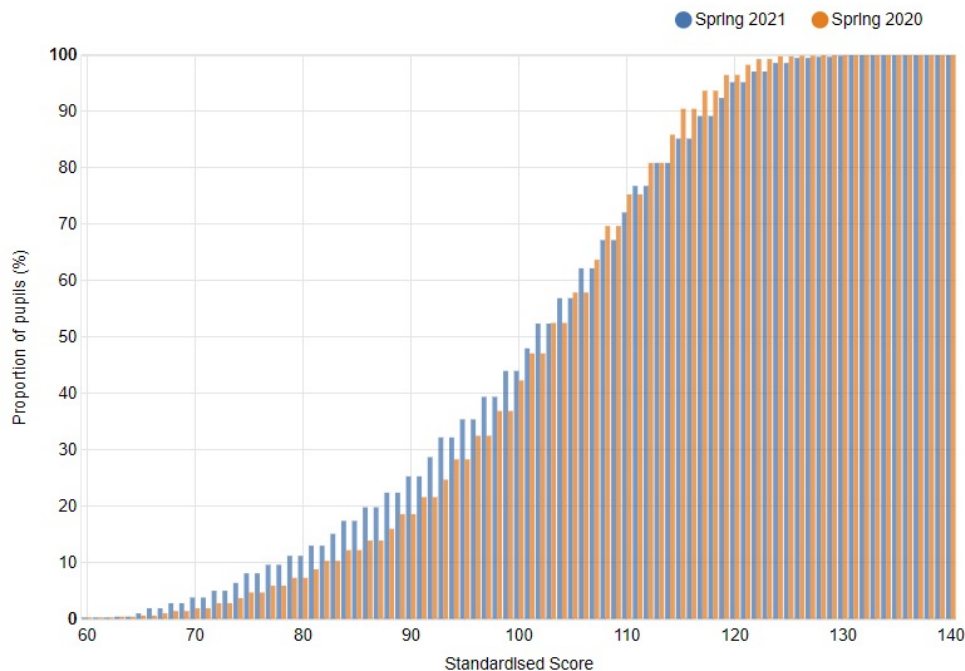


Sources: MARK, SchoolDash analysis.

Sample size: Approximately 5000 tests in 2020 and 6000 in 2021

At the other end of the primary school, in Year 6, Figures 5, 6 and 7 below indicate a similar pattern across the three subjects. Reductions in reading attainment appear to be concentrated among lower-attaining pupils, while maths and GPS showed broadly similar reductions across the whole range of scores.

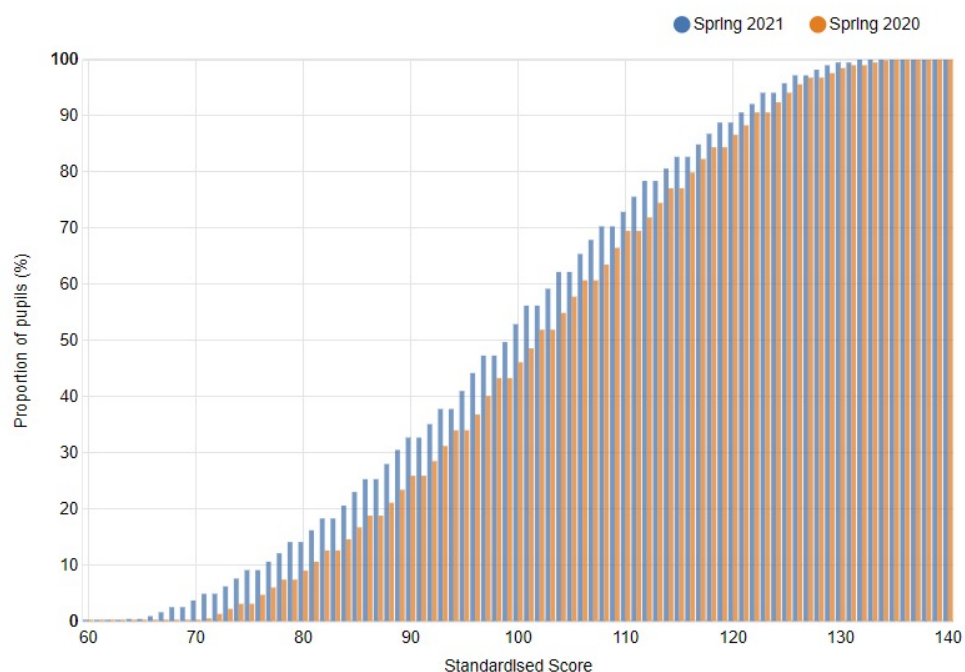
**Figure 5: Distributions of Standardised Scores for Spring Year 6 test in Reading**



Sources: MARK, SchoolDash analysis.

Sample size: Approximately 8000 tests in 2020 and 6000 in 2021

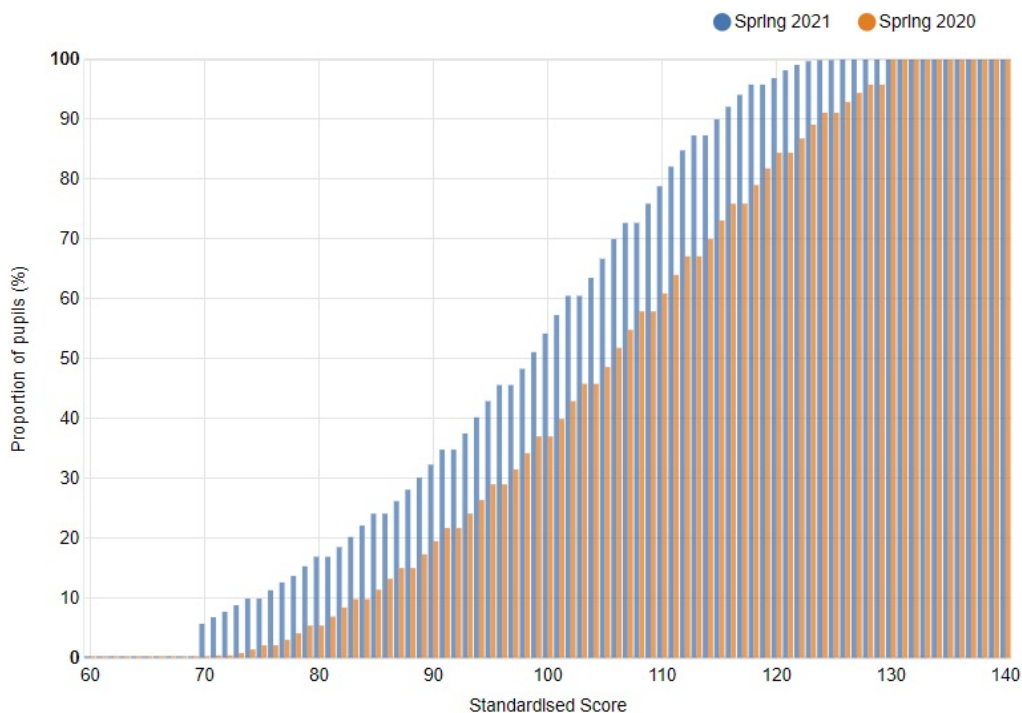
**Figure 6: Distributions of Standardised Scores for Spring Year 6 test in Maths**



Sources: MARK, SchoolDash analysis.

Sample size: Approximately 7000 tests in 2020 and 5000 in 2021

**Figure 7: Distributions of Standardised Scores for Spring Year 6 test in GPS**



Sources: MARK, SchoolDash analysis.

Sample size: Approximately 3000 tests in 2020 and 8000 in 2021

Matthew Wynne, Primary Regional Director, United Learning

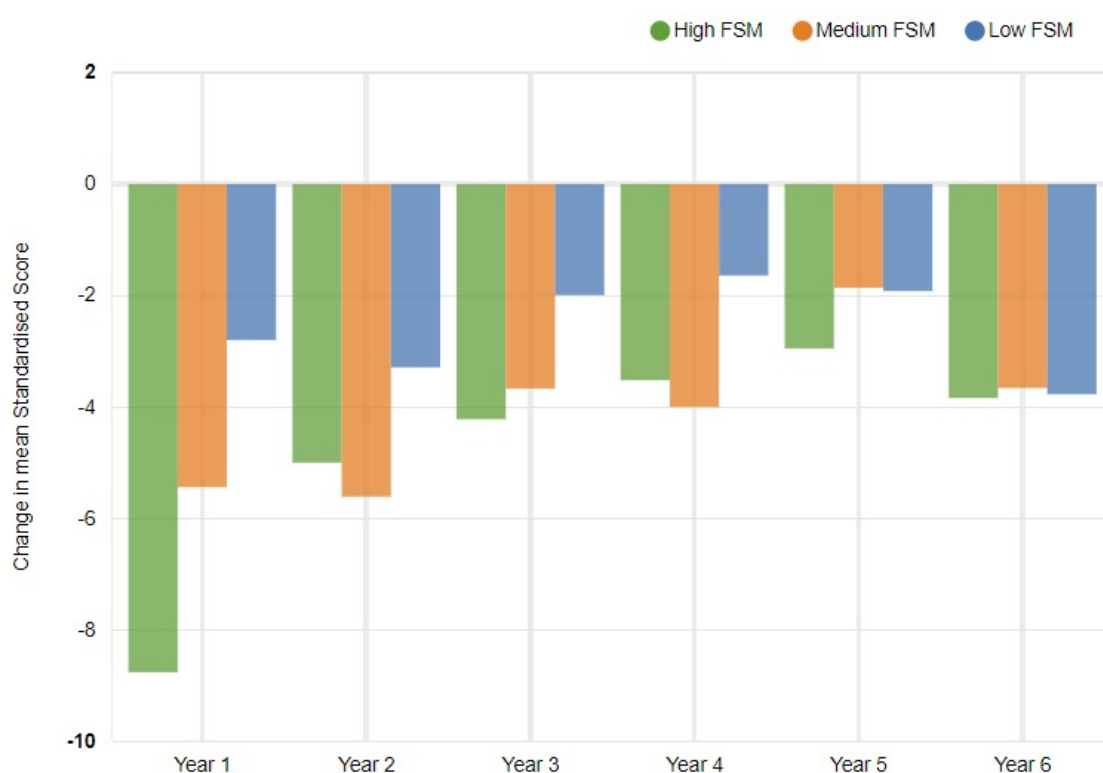
*"This white paper was reassuring to us. As a large group of schools, the progress rates seen nationally seem to mirror our own concerns following the spring test analysis. Clearly there is some way to go in terms of catch-up, however we feel that the longer term view is positive. Most pupils made progress from the autumn term baseline tests. Tracking across the academic year in this manner is enabling an accurate point to point mapping for each pupil, giving teachers the additional data analysis to inform daily classroom practice."*

## School deprivation

Previous analyses have shown that school type and location can affect changes in attainment. The following sections present selected examples of these trends. We use two ways to categorise schools by deprivation level, using either the in-school percentage of children eligible for free school meals (FSM), or local child-deprivation levels in the neighbourhood of school.

Figure 8 shows that falls in GPS attainment tended to be larger at high-deprivation schools, especially among younger pupils. Across all subjects falls at high-FSM schools are roughly double those at low-FSM schools.

**Figure 8: Change in mean Standardised Scores from spring 2020 to spring 2021 in GPS by school deprivation**



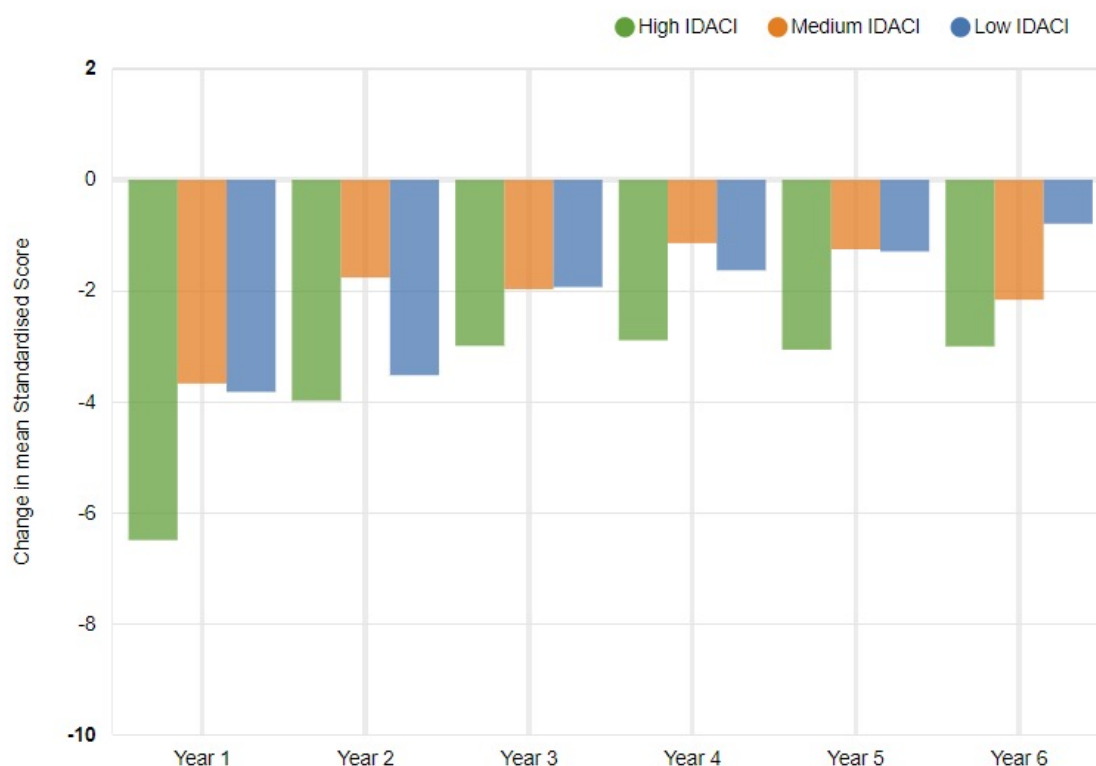
Sources: MARK, SchoolDash analysis.

Sample size: Approximately 40,000 tests in 2020 and 58,000 in 2021

## Local deprivation

It is also possible to look at the effects of poverty by local area using the Income Deprivation Affecting Children Index<sup>3</sup> (IDACI). Figure 9 shows year-on-year changes in mean Standardised Score by local deprivation rate for reading. Across all year groups, the declines in poorer areas (high IDACI) tended to be greater than those in more affluent areas (low IDACI).

**Figure 9: Change in mean Standardised Scores from spring 2020 to spring 2021 in Reading by local deprivation**



Sources: MARK, SchoolDash analysis.

Sample size: Approximately 95,000 tests in 2020 and 56,000 in 2021

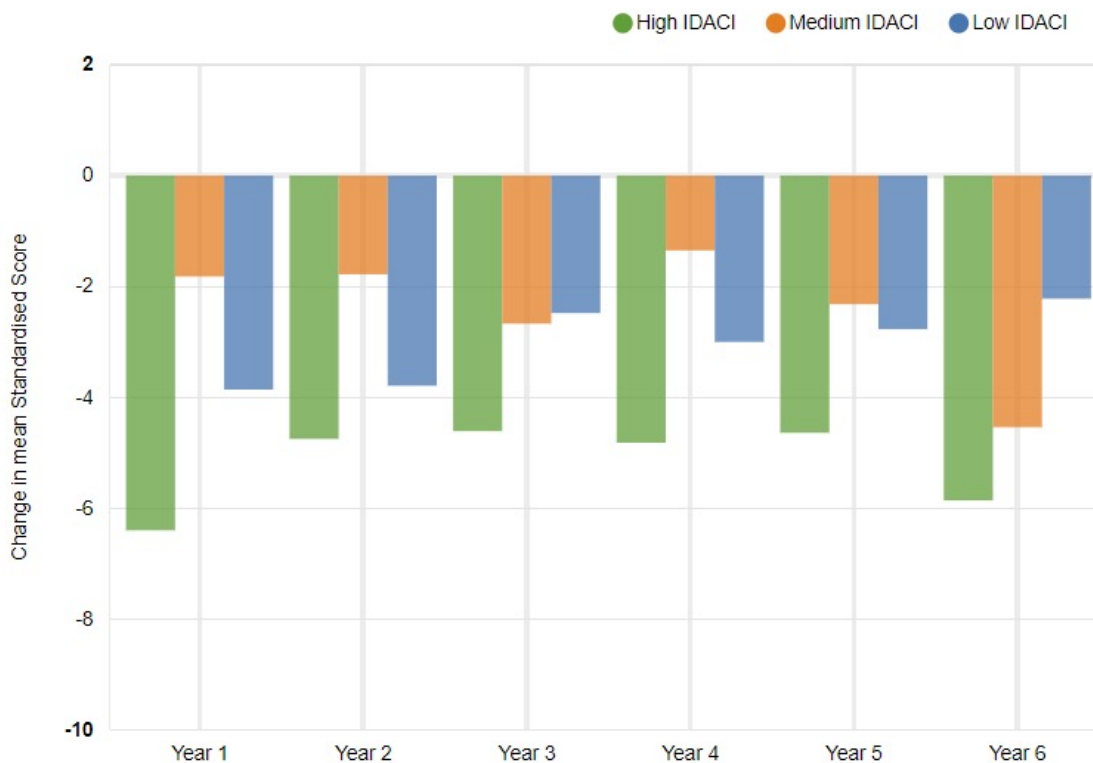
Professor Simon Burgess, University of Bristol

***“One of this report’s prominent findings again reinforces the fact that the school closures have generally hit disadvantaged pupils the hardest: high-poverty schools saw falls in attainment about twice as large as low-poverty schools over this period.”***

<sup>3</sup> IDACI is part of the government’s indices of deprivation: <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>

Figure 10 shows the same analysis for maths. Standardised Scores for children in schools located in higher deprivation areas showed consistently larger reductions in attainment.

**Figure 10: Change in mean Standardised Scores from spring 2020 to spring 2021 in Maths by local deprivation**



Sources: MARK, SchoolDash analysis.

Sample size: Approximately 87,000 tests in 2020 and 45,000 in 2021

Matthew Wynne, Primary Regional Director, United Learning

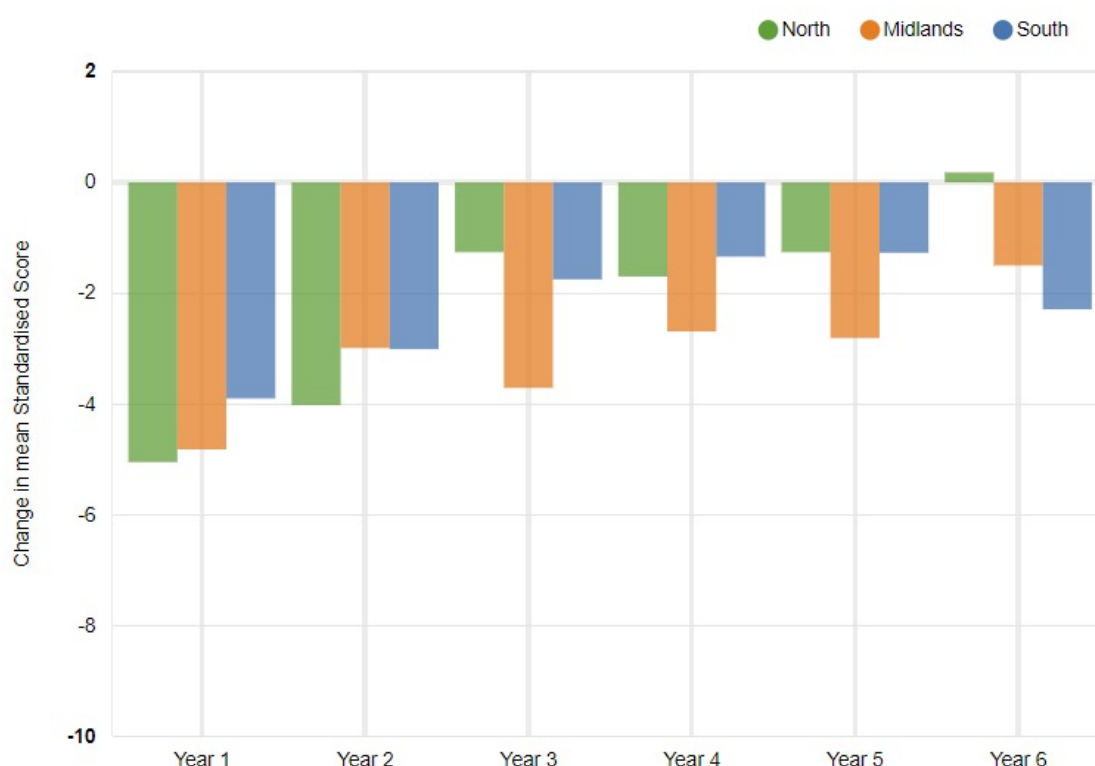
*“Given the significant amount of time out of school, the maths curriculum was not fully taught. PUMA outcomes showed some significant gaps in learning, analysis shows that on average children had missed 20% of the required curriculum content. Switching to Ready to Progress materials requires some deeper analysis of the summer papers to ensure we have a pre-emptive understanding of the possible gaps. In addition to this, it was noted that parental confidence when supporting maths was limited, certainly for our KS2 children/families. Confidence in supporting reading was the opposite, parents engaged with the shared text and phonics lessons. We feel that this has enabled a number of pupils to maintain confidence as well as a steady rate of progress.”*

## Regional disparities

Analysis of the autumn term 2020 test results showed some surprising regional differences. The South was least affected in their reading scores, with the Midlands accounting for almost all of the declines in the older years. In maths notably the Midlands showed by far the largest falls in attainment, whereas schools in the North declined the most in GPS.

This analysis of spring 2021 reading tests again shows the schools in the Midlands had the largest drops in Years 3, 4 and 5. This may be linked to the fact that, at least in our sample, schools in the Midlands had the highest overall FSM rates.

**Figure 11: Change in mean Standardised Scores in Reading by region**

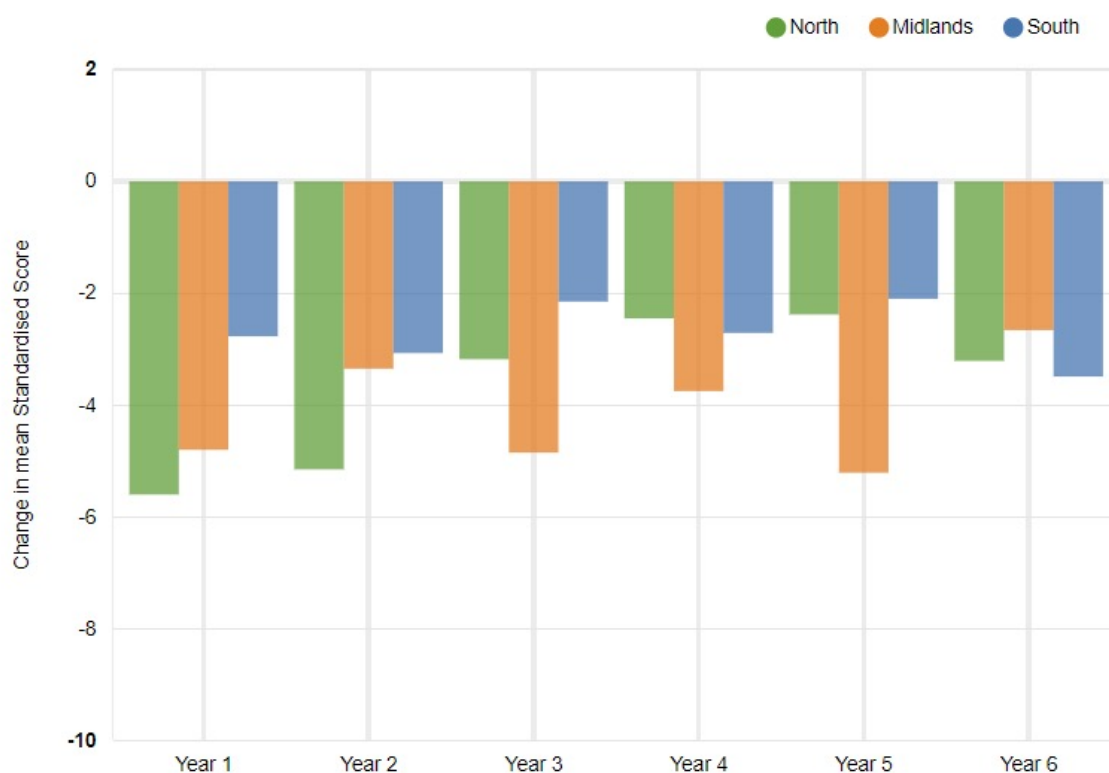


Sources: MARK, SchoolDash analysis.

Sample size: Approximately 95,000 tests in 2020 and 51,000 in 2021

Figure 12 shows the same analysis for maths, and indicates a similar picture, with larger reductions in attainment among pupils in Years 3, 4 and 5 attending schools in the Midlands. Attainment drops in the North were larger for Years 1 and 2.

**Figure 12: Change in mean Standardised Scores in Maths by region**



Sources: MARK, SchoolDash analysis.

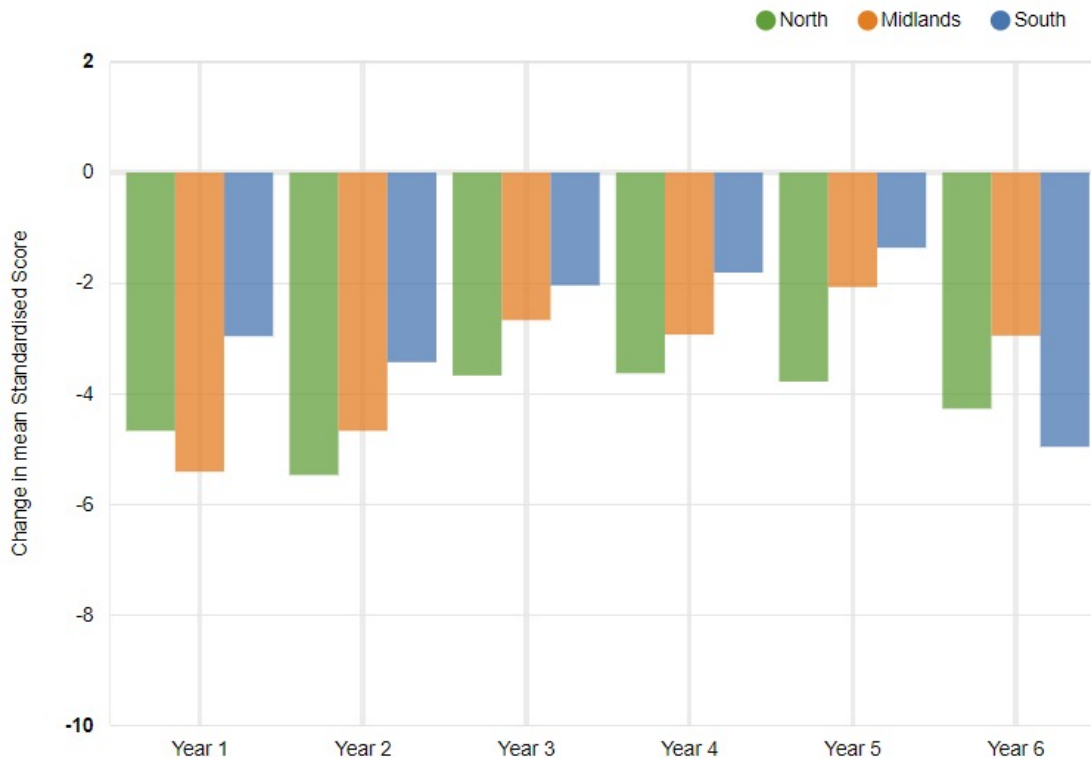
Sample size: Approximately 87,000 tests in 2020 and 45,000 in 2021

Matthew Wynne, Primary Regional Director, United Learning

*“We are focused upon the use of PiRA and PUMA to set out the pathway for an effective catch-up strategy, using the gap analysis to inform daily Quality First Teaching as well as bespoke pupil-specific learning.”*

Finally, Figure 13 shows the same analysis for GPS. Across all year groups the North tended to show the largest attainment drops in attainment, as autumn 2020, but with some variation by year group.

**Figure 13: Change in mean Standardised Scores in GPS by region**



Sources: MARK, SchoolDash analysis.

Sample size: Approximately 40,000 tests in 2020 and 59,000 in 2021

Professor Simon Burgess, University of Bristol

*“This almost real-time data on student achievement and learning loss is very valuable to the people trying to plot our way out of this situation.”*

## Appendix

We have previously analysed aggregate, anonymous data to reveal national attainment trends across schools in England, including variations by pupil age, season of birth and gender, as well as by subject and even individual topics within each subject. See [risingstars-uk.com/whitepaper](https://risingstars-uk.com/whitepaper) for these previous analyses. In order to protect the confidentiality of the institutions and individuals concerned, results have been analysed and presented in an anonymised, aggregate form.

All data has been processed in line with MARK terms and conditions, which can be found at [risingstars-uk.com/markterms](https://risingstars-uk.com/markterms).

### Tests and scores

The data used in this report comes from standardised, termly tests PiRA, PUMA and GAPS. The tests were taken in spring 2020 and 2021 and entered into MARK, a free marksheet and reporting service. The termly tests are marked by teachers using a robust mark scheme, and raw scores are converted to Standardised Scores automatically in MARK. We have analysed only results from fully completed tests, with non-zero scores sat by a pupil within the correct age range. Tests sat at the wrong time of year have been omitted.

Where results are presented as a change in score, spring 2020 is treated as the baseline comparison point.