Educational disadvantage: How does England compare?

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About the Education Policy Institute

The Education Policy Institute is an independent, impartial, and evidence-based research institute that aims to promote high quality education outcomes, regardless of social background. We achieve this through data-led analysis, innovative research and high-profile events.

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This publication includes analysis of the National Pupil Database (NPD):

www.gov.uk/government/collections/national-pupil-database

The Department for Education is responsible for the collation and management of the NPD and is the Data Controller of NPD data. Any inferences or conclusions derived from the NPD in this publication are the responsibility of the Education Policy Institute and not the Department for Education.

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Foreword

The Education Policy Institute has been pleased to partner with Professors John Jerrim and Toby Greany at the UCL Institute of Education, to consider the size of the "disadvantage gap" in English education; how this compares with other advanced countries - including the "World Leading" education nations; and what may explain England's relative performance.

This is the third and final report in a partnership between the Institute of Education and EPI to benchmark England against other "higher income" countries, using the PISA education statistics.

Our aim has been to provide a more balanced and fair assessment of England's comparative strengths and weaknesses than is often presented in the public discourse about education quality in England, and to measure gaps between English performance and that in other countries in terms that are easily comprehensible to an English audience - i.e. in GCSE equivalents.

We hope that this fairer assessment of English performance will improve the quality of debate, lead to more focus on areas where English performance is genuinely poor (for example, the scale of the overall attainment gap in England), help understand where our performance is strong or closer to average, and stimulate debate about what we can learn from the nations who top the tables and particularly those which succeed in delivering both equity and excellence.

We are, once again, particularly grateful to John Jerrim and Toby Greany. We welcome responses to this and the earlier reports in this series.

Rt. Hon. David Laws

Executive Chairman, Education Policy Institute

Executive summary

In this third report by the Institute of Education and the Education Policy Institute, we study the performance of disadvantaged pupils in England and the gap between those pupils and their peers. We compare England's performance on both measures to other, developed countries.

The definition of 'disadvantaged pupils' in England, used in this report, is those eligible for Free School Meals (FSM). As this measure relates to pupils in England only, we estimate a similar group of disadvantaged pupils in other countries using the Economic, Social and Cultural Status (ESCS) index used in the PISA 2015 study. Using these estimations, we find that England has an FSM rate of 10.5 per cent, the 8th lowest of all countries included in this study.[1] Iceland has the lowest estimated proportion of FSM pupils, at 8.1 per cent.

Key findings

Performance in mathematics

- **The average maths GCSE grade of disadvantaged pupils in England is around 3.8. This is lower than a 'pass' under the new GCSE arrangements and, on this measure, England is positioned 25th of the 44 nations in the report.**

- This is around a third of a grade lower than many other Western nations including Estonia, Canada, the Netherlands and Ireland and more than half a grade lower than in the leading Asian nations of Macao, Singapore, Hong Kong, Taiwan and Japan.

- **The gap between disadvantaged pupils and their peers in England is equivalent to one whole GCSE grade. This places England at 27 out of 44 jurisdictions in terms of the size of the socio-economic gap.**

- The gap is notably smaller in some high performing countries including Estonia (0.71 of a grade), Hong Kong (0.85) and Norway (0.84). However, other high performing countries (in terms of overall performance in PISA), have a higher gap, including China and Singapore where the gap is equivalent to 1.2 of a GCSE grade.

- There is also a long tail of underperformance amongst disadvantaged pupils in England. Only 10 per cent of FSM pupils in England achieved the equivalent GCSE maths score of 7 to 9 (or an A-A* under the old system), compared to 18 per cent of disadvantaged pupils in Singapore. Conversely, 40 per cent of FSM pupils failed to reach a grade 4 (the new GCSE pass mark), compared to an estimated 28 per cent in Singapore.

[1] This figure is lower the Department for Education's reported data as the PISA sample includes privately educated pupils and is not a perfectly representative sample of England's state school population.

Performance in reading

- Performance in reading is slightly higher than in maths. **FSM pupils in England scored an average grade of 4.0 (the equivalent of a pass) and are ranked 17th out of the 44 nations.**

- The leading Western nations, Canada, Finland, Estonia, Norway and the Republic of Ireland, all rank higher than England with an average score of 4.2/4.3.

- **The gap between disadvantaged pupils in England and their peers is around three-quarters of a GCSE grade (0.76) and around the average of all other countries in the report.** Wales and Northern Ireland perform better than England on this measure, with a gap of around two-thirds of a GCSE grade (0.64 and 0.66 respectively).

- Once again, Estonia and Japan demonstrate both high performance overall and a relatively small socio-economic gap (at just over two-thirds of a GCSE grade). Meanwhile the gap in China and Singapore is close to a whole GCSE grade (at 0.92 and 0.96 respectively).

Policy implications

These findings support existing evidence from the OECD that "high performance and greater equity in educational opportunities and outcomes are not mutually exclusive". Based on analysis of the 2015 PISA data, Canada, Denmark, Estonia, Hong Kong and Macao tend to achieve both high performance and high equity. However, countries such as Singapore and China also demonstrate that high performance is not always a guarantee of greater equity. Policy-makers therefore need to identify the common features of high performing *and* high equity nations.

In Chapter 3, we identify areas in which policy and practice in England differs most significantly from those in high performing and high equity nations.

- **Avoid segregation, selection and streaming / setting**: The OECD is clear that policy makers should seek to limit both selection by ability and the negative consequences of school choice. Both policies have the effect of increasing segregation or stratification between schools, with disadvantaged pupils more likely to be found in less popular schools. Not only does this tend to have an impact on a school's ability to recruit good teachers, the OECD also finds that, in countries where schools tend to be more segregated, the impact of the school's socio-economic intake is higher. This means that schools which serve disproportionate numbers of disadvantaged students are less able to counter the effects of that disadvantage than schools with a more balanced, comprehensive intake. The English system remains comprehensive to a large extent and does not generally allow tracking by ability until age 16, but there is emerging evidence that the system has become more segregated since 2010, while recent structural changes, such as the proposal to let grammar schools expand, could accelerate this shift.[2]

[2] Greany, T. and Higham, R. (in press) *Hierarchy, Markets and Networks: analysing the 'self-improving school-led system' agenda in England and the implications for schools*. IOE Press: London.

- **Attract, support and retain high quality teachers**: In the PISA 2015 survey, 45 per cent of head teachers in England reported that teacher shortages were the greatest barrier to improving outcomes, compared to around 30 per cent for the OECD. The situation in disadvantaged schools is more acute – since these schools generally face greater recruitment challenges and have higher levels of turnover than other schools.[3]

- **A responsive funding system**: England fares reasonably well on this measure. Plans to introduce a new national funding formula in England will improve the transparency of school budgets and the Pupil Premium provides further resources to disadvantaged pupils. But policy-makers should not be complacent. The new national funding formula will redistribute some funding away from disadvantaged pupils and there are still widespread concerns about the overall quantum of funding.

[3] https://www.gov.uk/government/statistics/local-analysis-of-teacher-workforce-2010-to-2015

Part One: Introduction & methodology

Introduction

This is the third in a series of EPI reports using international educational assessment data to explore how England compares with the world leading education nations for the performance of school-age children in reading and mathematics. In earlier reports we found that:

- Based on a sample of pupils who participated in the OECD's Programme for International Student Assessment (PISA) in 2015 in maths**, GCSE maths scores for pupils in England would need to increase by around two-thirds of a grade on average, in order to match the top five performing jurisdictions**. The average attainment of the top five nations in reading was equivalent to a GCSE points score of 4.9, only slightly higher than the average grade for England's PISA participants, at 4.7.[4]

- The Government's 'expected standard' in Key Stage 2 mathematics is broadly in line with the average performance of the top-performing countries. **In the five top-performing nations, it was estimated that an average of 90 per cent of pupils would have achieved the expected standard, compared to 75 per cent of England's Trends in Mathematics and Science Study (TIMSS) sample.** The variation in TIMSS scores in England was significantly higher than that of many other countries included in the study. In the top-performing nations, the difference between the highest and lowest attaining pupils was around 16.2 points; in England, it was 18.6 points.[5]

In this paper, we investigate the socio-economic gap in secondary school pupils' academic achievement using the PISA 2015 dataset, which has been linked to the National Pupil Database (NPD). Our goal is to estimate how disadvantaged pupils would achieve in England's GCSE examinations for mathematics and reading. This in turn leads us to develop a new set of 'World Class benchmarks' which we hope will help policymakers determine the education standards that we should be expecting of disadvantaged pupils in this country – both in terms of their absolute performance and the size of 'gap' relative to more advantaged peers.

Using PISA to assess the performance of disadvantaged pupils

In 2000, the Organisation for Economic Co-Operation and Development (OECD) undertook the first in a series of international benchmarking tests, the Programme for International Student Assessment (PISA). Taking place every three years, PISA assesses 15-year-olds from OECD and other participant countries and economies in mathematics, reading and science. In the latest PISA study, conducted in December 2015, 72 jurisdictions participated – including all 35 OECD countries and 37 partner countries and economies.[6]

PISA collects a range of background information on students that can be used to assess differences in attainment across those from different socio-economic background. Students report on their parent's highest level of education, their occupational status, and answer several questions about

[4] Jerrim, J., Andrews, J. and Perera, N., 'English Education: World Class?', August 2017.
[5] Jerrim, J., Perera, N. and Sellen, P., 'English Education: World Class in Primary?', December 2017.
[6] OECD, 'PISA Results 2015: Volume I', December 2016.

the presence, and number of, certain possessions in their home (including books and other goods). This information is summarised by the OECD in their index of economic, social and cultural status (ESCS) to provide a means of comparing participating students internationally (i.e. the index is a continuous proxy measure for socio-economic background relative to students across all countries in PISA, not relative to the rest of a student's own country).[7] This information can be used to estimate how performance in PISA varies across students from different backgrounds, and how the importance of socio-economic background varies across different countries.

The Trends in Mathematics and Science Study (TIMSS) is conducted by the International Association for the Evaluation of Educational Achievement (IEA). It takes place every four years and attempts to measure the knowledge and skills relative to an internationally-determined mathematics and science curriculum for pupils in both Year 5 (4th grade) and Year 9 (8th grade).[8] The IEA's Progress in International Reading Literacy Study (PIRLS) is conducted every five years, and assesses the reading comprehension of 4th grade students.[9] It was considered whether such studies could be used here to compare attainment gaps for younger pupils than those participating in PISA. However, TIMSS and PIRLS collect less information on students' backgrounds than PISA, particularly for countries (such as England) where parents have not been surveyed in addition to students. Therefore, this study focuses on PISA results.[10] The IEA should consider improving the socio-economic background information recorded in TIMSS and PIRLS to support research into the drivers of primary-age pupil performance.

Linked NPD-PISA database

We use the data from the most recent PISA cycle in 2015. While PISA 2000 to 2012 were all paper-based tests, computer-based assessment was implemented in PISA 2015 for the first time. A two-stage sample design was used to collect the data. Schools were first sampled with probability proportional to size, and then pupils randomly selected from within. A total of 5,194 pupils from 206 schools in England participated in PISA 2015, which reflects official response rates of 92 percent at the school level and 88 percent at the pupil level[11]. In England, almost every participating pupil is within the same year group (Year 11), which is not the case in most other countries with variable school starting dates and the use of grade repetition[12]. This is similar to the response rates achieved in most other countries, and is fully compliant with the standards set by the OECD. Further details on the comparison of GCSE grades for the PISA 2015 sample for England compared to the national

[7] OECD, 'PISA 2015 results: Volume III', April 2017, pp. 251.
[8] Mullis, I. V. S., Martin, M. O., Foy, P., & Hooper, M., 'TIMSS 2015 International Results in Mathematics', 2016.
[9] Mullis, I. V. S., Martin, M. O., Foy, P., & Hooper, M., 'PIRLS 2016 International Results in Reading', 2017.
[10] Where parents are not surveyed, the 'Home Educational Resources' measure is based only on the number of books in the home (in 5 categories), the availability of an internet connection or the student having their own room, and the highest education of their parent. This provides less informative variation across students, particularly in England. In TIMSS 2015, the IEA's report divides students into three groups, with 'Many', 'Some' or 'Few' Resources; for grade 8 students in the mathematics assessment, 19% of England's students had 'Many' resources, 76% had 'Some' resources, whilst just 5% had 'Few'.
[11] School-level response rates in England were 83 percent before replacement schools were included and 92 percent after.
[12] PISA draws an age-based sample, meaning all pupils are around age 15/16 at the time of the assessment. In England the timing of the assessment means almost all the selected pupils are within Year 11. However, in other countries, pupils of this age are spread across different school year groups.

grade distribution based upon data from all Year 11 pupils is provided in Annex A. Throughout our analysis, we apply the final pupil response weights to take the complex PISA survey design into account.

The PISA 2015 sample for England has been linked to the National Pupil Database (NPD), which includes administrative data on pupils' backgrounds along with their performance on national examinations. Critically, this includes pupils' GCSE grades. A successful link has been made for 4,914 pupils (95 percent of the sample)[13]. The total number of pupils with valid information on GCSE mathematics grades is 4,778 pupils (92 percent of the sample) and 4,735 pupils (91 percent of the original sample) for English Language grades.

Imputation of GCSE grades and FSM status

Our empirical methodology is based around multiple imputation. The PISA-NPD file for England includes both children's PISA test scores (plausible values) and their scores in the Key Stage 2 test / GCSE grades. We append to this the public use PISA datafile for all other comparator countries. Hence, we have a set of variables (PISA) which are observed for all participating pupils in all countries, and another set of variables (GCSE grades) which are only observed for pupils in England. The fact that GCSE grades are not observed in other countries is treated as a missing data problem, which we attempt to solve via multiple imputation. In other words, we predict how well children in other countries would have done had they taken GCSE exams, based upon how they performed on the PISA 2015 test. This prediction is based upon the relationship between PISA and GCSE grades in England. One advantage of using multiple imputation by chained equations is that we are able to retain in our analysis even those pupils in England whose GCSE data could not be matched. Hence all pupils who participated in PISA 2015 in England are included in our results. This includes pupils in independent schools.

Our imputation model applies multiple imputation by chained equations (MICE). The chained models include the Economic, Social and Cultural Status (ESCS) index, a binary indicator for FSM eligibility, GCSE grades[14] and PISA achievement levels (based upon the first plausible value) as a set of dummy variables. The final pupil weight is applied, with the imputation models run separately for England in combination with each comparator country. In a previous report, we have run further robustness tests, and found that results do not change substantially if a more complex imputation model is estimated, or if raw PISA scores (percentage correct) rather than scaled.[15]

The above imputation process means that, for each participating country, we have generated a set of synthetic FSM indicators and GCSE grades. We use these synthetic variables throughout our analysis in order to produce an estimate of (i) the average performance of a group comparable to FSM pupils in each country and (ii) the size of the FSM gap. From these results, we can infer how

[13] Independent school pupils were less likely to have linked GCSE data than state school pupils. Although the high overall linkage rate should mean that this has only a relatively minor impact upon our results, the multiple imputation methodology we shall describe in the following section should further limit any potential bias due to linkage not being possible.

[14] In our results section, when we report the proportion of children achieving each grade, our imputation model has treated GCSE grades as a categorical variable. When we reported average numeric grades, the imputation model has treated GCSE grades as a linear continuous variable.

[15] Jerrim, J., Andrews, J. and Perera, N., 'English Education: World Class?', August 2017.

England's GCSE grades needs to change for low-income (FSM) pupils, so that this country becomes one of the world's leading education systems for socio-economically disadvantaged pupils.

Although in this research we are attempting to benchmark GCSEs against the PISA study, it is important to recognise that these two assessments differ in non-trivial ways. First, whereas GCSEs measure pupils' knowledge, understanding and application of material taught within national curricula, PISA focuses more upon the application of skills in 'real-life' situations. Second, previous analysis of the PISA test questions found that they typically require a greater amount of reading than GCSE examinations, particularly in science.[16] Third, the tests are taken around six months apart, with Year 11 pupils first taking PISA in November/December 2015 and then sitting their GCSEs in May/June 2016. Fourth, whereas GCSES continue to be implemented using pen and paper, PISA 2015 was a computer-based assessment. Finally, GCSEs are a 'high-stakes' test for pupils and schools who have a great deal riding upon the results. This is not the case for PISA, which is a low-stakes test, with the results having little direct implications for pupils or schools.

The main implication of these differences is that, although PISA scores and GCSE grades will be positively correlated, it is unlikely that there will be an exact relationship. Indeed, previous research has suggested that demographic groups perform differently across these two assessments.[17] There will consequently be an element of uncertainty in our results, and the benchmarks we set for England to become a world-leading country. Nevertheless, given that PISA scores and GCSE grades correlated at around 0.7 to 0.8 (author's calculations), our results will provide reasonably good approximations as to how England's PISA scores are likely to change for a given increase in GCSE grades.

[16] Ruddock, G., Clausen-May, T., Purple, C., and Ager, R., 'Validation Study of the PISA 2000, PISA 2003 and TIMSS-2003 International Studies of Pupil Attainment', 2006, DfES Research Report 772, Slough: NFER.
[17] Jerrim, J. and Wyness, G., 'Benchmarking London in the PISA Rankings', February 2016

Results

For context, Figure 1.1 provides some descriptive information on the countries included in this report. This includes details on average performance in the PISA for reading and mathematics, variation in performance (difference in scores between the 10th and 90th percentiles), and the magnitude of the gap in mathematics performance (difference in scores between the most and least advantaged socio-economic group – as defined by the top and bottom quartile of the ESCS index). The red shading indicates a statistically significant worse performance than England, while blue shading indicates a significantly better performance. The use of '*' indicates figures that are statistically significantly different from England at the five percent level.

Annex A presents the outcome of the imputation procedure in terms of the FSM classification of PISA participants. The proportion of the PISA sample estimated to be registered for FSM in England is 10.5 per cent. This is lower than the rates reported in Department for Education statistics, reflecting that the PISA sample includes independent school pupils and is not perfectly representative of England's state school population. England's FSM rate is the 8th lowest of the countries included in this study. Iceland has the lowest estimated proportion, at 8.1 per cent.

Reflecting that the ESCS captures more information about home environments than income, and is not a linear measure, the variation in FSM equivalent rates is smaller than might be expected based on the variation in GDP per capita of the countries included: 33 of 44 countries considered have estimated FSM rates lower than 15 per cent. Mexico, Vietnam and Turkey have the highest estimated rates, all at over 25 per cent but less than 30 per cent. In most countries there are a reasonable number of students classified as FSM in the PISA sample for the purposes of analysis. However, in Wales, Northern Ireland, Scotland, Norway and Iceland there are fewer than 400 in this category, so for such countries there will be more uncertainty in attainment results, and in the classification of FSM-equivalent rates too.

Figure 1. Key indicators across selected countries [18]

Country	Mathematics			Reading		
	Average PISA maths score	Gap between highest and lowest achievers	Socio-economic gap	Average PISA reading score	Gap between highest and lowest achievers	Socio-economic gap
Singapore	564*	247	98*	535*	257	108*
Hong Kong	548*	232	52*	527*	220*	46*
Macao	544*	204*	34*	509*	212*	34*
Taiwan	542*	266*	94	497	240	84
Japan	532*	227*	79	516*	238*	77
China	531*	276*	117*	494	283*	129*
South Korea	524*	258	92	517*	251	76
Switzerland	521*	247	91	492	254	96*
Estonia	520*	209*	68	519*	226*	65*
Canada	516*	227*	67*	527*	238*	70
Netherlands	512*	237	79	503	262	89
Denmark	511*	209*	69	500	225*	73
Finland	511*	210*	73	526*	239*	75
Slovenia	510*	228*	73	505	239*	77
Belgium	507*	255	104*	599	263	105*
Germany	506*	230*	89	509*	258	93
Poland	504*	226*	79	506	231*	83
Ireland	504*	206*	76	521*	222*	78
Norway	502*	219*	67*	513*	255	62*
Austria	497	247	89	485*	265	98*
New Zealand	495	238	88	509*	274*	94
Sweden	494	233	89	500	262	86
Australia	494	242	85	503	265*	88
England	493	245	81	500	254	79
France	493	249	110*	499	293*	122*
Northern Ireland	493	204*	75	497	220*	73
Czech Republic	492	235	107*	487*	262	110*
Portugal	492	249	97*	498	240*	92
Scotland	491	219*	73	493	235*	69
Italy	490	241	78	485*	244	82
Iceland	488	241	62*	482*	256	54*
Spain	486*	220*	83	496	224*	79
Luxembourg	486*	244	111*	481*	279*	125*
Latvia	482*	200*	67*	488*	221*	67
Wales	478*	201*	53*	477*	219*	48*
Hungary	477*	246	114*	470*	255	118*
Slovak Republic	475*	247	95	453*	271*	106*
Israel	470*	269*	91	479*	295*	93
United States	470*	230*	86	497	259	78
Greece	454*	234	78	467*	256	93
Turkey	420*	212*	59*	428*	213*	61
Mexico	408*	193*	56*	423*	202*	68

[18] Figures based upon PISA mathematics unless otherwise stated. Comparisons in this report do not include Chile, Kuwait, South Africa, Morocco and Jordan.

Mathematics

Figure 1.2 illustrates the estimated distribution of GCSE mathematics grades for FSM pupils across countries. This includes the proportion of FSM pupils reaching grades 9 to 7 (A* or A), 6 to 4 (B or C) and 3 to U (D and below), along with the estimated average grade. England sits firmly in the middle of this table, with the average GCSE mathematics grade achieved by FSM pupils around 3.8. This is more than half a grade lower than in the leading East Asian nations of Macao, Singapore, Hong Kong, Taiwan and Japan, where the average GCSE mathematics grade of their disadvantaged pupils is around 4.5.

Moreover, there are a number of Western nations where low-income pupils perform better than their peers in England, such as Estonia (average FSM maths grade of 4.4), Canada (4.2), the Netherlands (4.2), Ireland (4.1) and Switzerland (4.1). Consequently, a significant increase in GCSE mathematics performance – of at least a third of a grade – is needed amongst FSM pupils for disadvantaged young people in England to match their peers in these parts of the world.

Annex B provides a set of alternative results based upon the old GCSE alphabetic grades. Moreover, we have produced a graph comparing the GCSE grade distribution for FSM pupils in England to each of the comparator countries. An example comparing England to Singapore is presented in Figure 1.3 (analogous graphs for other countries available upon request). This illustrates how less than 10 per cent of FSM pupils in England achieve a GCSE A or A* (7 to 9) grade, compared to an estimated 18 per cent of disadvantaged pupils in Singapore. Equally, around 40 percent of FSM pupils in England fail to reach grade C (grade 4) in mathematics, compared to an estimated 28 percent in Singapore.

Table 1.2: Estimated distribution of GCSE mathematics grades for FSM pupils across countries[19]

Country	Grade 1 to 3	Grade 4 to 6	Grade 7 to 9	Average grade
Macao	24%	60%	16%	4.6
Singapore	28%	55%	17%	4.5
Hong Kong	27%	58%	14%	4.5
Taiwan	32%	54%	15%	4.4
Japan	28%	58%	13%	4.4
Estonia	29%	58%	13%	4.4
Denmark	29%	59%	12%	4.2
Canada	29%	58%	13%	4.2
South Korea	33%	54%	13%	4.2
Netherlands	34%	55%	11%	4.2
Finland	32%	57%	12%	4.2
Switzerland	34%	54%	11%	4.1
Norway	35%	55%	10%	4.1
Ireland	33%	57%	11%	4.1
Iceland	36%	55%	9%	4.1
Slovenia	34%	56%	11%	4.1
Sweden	34%	57%	10%	4.0
Russia	33%	57%	10%	3.9
Poland	35%	56%	9%	3.9
Germany	37%	54%	9%	3.9
China	38%	51%	11%	3.9
Australia	37%	53%	10%	3.9
New Zealand	37%	52%	10%	3.9
Belgium	39%	52%	10%	3.8
England	**39%**	**53%**	**9%**	**3.8**
Austria	40%	51%	9%	3.8
Scotland	36%	55%	9%	3.8
France	42%	49%	9%	3.8
Italy	40%	51%	9%	3.7
Czech Republic	40%	51%	9%	3.7
Wales	41%	52%	6%	3.6
Latvia	40%	53%	7%	3.6
Portugal	45%	47%	8%	3.6
Spain	43%	50%	7%	3.5
Luxembourg	45%	48%	7%	3.5
Slovak Republic	45%	48%	7%	3.5
Israel	47%	47%	7%	3.5
Hungary	47%	47%	6%	3.5
USA	45%	49%	6%	3.5
Vietnam	45%	49%	6%	3.4
Greece	48%	46%	5%	3.3
Turkey	63%	35%	2%	2.7
Mexico	62%	36%	2%	2.6

[19] Figures based upon equivalences between old alphabetic GCSE grades and new numeric GCSE grades. Grades A*/A are equated to grades 7/8/9, grades B/C are equated to grades 4/5/6 and grades D and below equated to grades 1/2/3. See Appendix B for results presented in terms of alphabetic grades.

Figure 1.3: The estimated GCSE mathematics grade distribution for FSM pupils in England and Singapore[20]

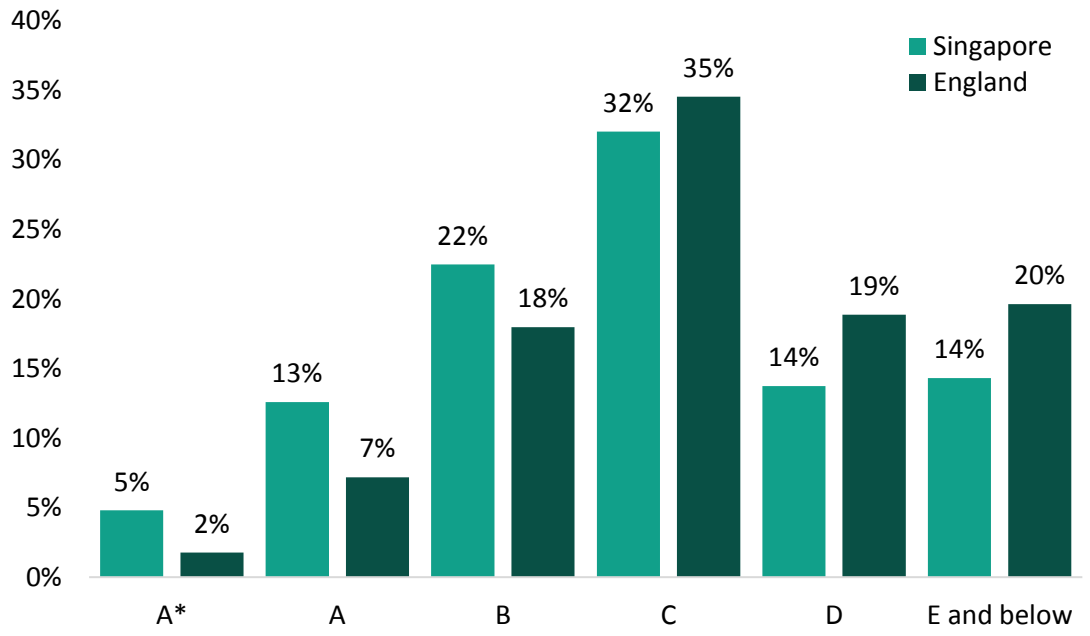


Figure 1.4 turns to the magnitude of the FSM gap in mathematics between FSM and non-FSM pupils. In England, the gap is equivalent to one whole GCSE grade, with non-FSM pupils achieving an average grade of 4.8 in mathematics, compared to 3.8 for their FSM peers. The size of this gap is notably smaller in some countries, such as Estonia (0.71 of a grade difference), Hong Kong (0.85 grade difference) and Norway (0.84 grade difference).

On the other hand, some of the world's leading countries in terms of overall performance have a much more substantial disadvantaged gap, such as China and Singapore (1.2 grade difference). For instance, FSM pupils in England have very similar levels of achievement in mathematics to the equivalent group of disadvantaged pupils in China (average mathematics grades of 3.8 versus 3.9). Hence the main driver of the difference between these countries is in the mathematics skills of non-FSM pupils (average grades of 4.8 versus 5.1). Together, this highlights how the highest-performing PISA countries can differ markedly in terms of the magnitude of the socio-economic achievement gaps.

[20] Analogous graphs available for each comparator country upon request.

Figure 1.4: The estimated gap in average GCSE mathematics grades between FSM and non-FSM pupils across countries[21]

Country	Not FSM pupils	FSM pupils	FSM gap
Macao	5.3	4.6	-0.71
Estonia	5.1	4.4	-0.71
Iceland	4.9	4.1	-0.77
Ireland	4.9	4.1	-0.82
Russia	4.8	3.9	-0.83
Norway	5.0	4.1	-0.84
Hong Kong	5.3	4.5	-0.85
Latvia	4.5	3.6	-0.85
Mexico	3.5	2.6	-0.86
Wales	4.5	3.6	-0.87
Japan	5.2	4.4	-0.87
Poland	4.8	3.9	-0.89
Turkey	3.6	2.7	-0.90
Netherlands	5.1	4.2	-0.90
Sweden	4.9	4.0	-0.90
South Korea	5.1	4.2	-0.92
Finland	5.1	4.2	-0.92
Northern Ireland	4.7	3.8	-0.93
Denmark	5.2	4.2	-0.93
Vietnam	4.4	3.4	-0.94
Slovenia	5.0	4.1	-0.94
Canada	5.2	4.2	-0.95
Australia	4.9	3.9	-0.96
New Zealand	4.8	3.9	-0.98
Scotland	4.8	3.8	-0.99
Italy	4.7	3.7	-0.99
England	4.8	3.8	-0.99
Czech Republic	4.7	3.7	-1.00
Taiwan	5.4	4.4	-1.00
France	4.8	3.8	-1.01
Greece	4.3	3.3	-1.02
Austria	4.9	3.8	-1.03
Switzerland	5.2	4.1	-1.03
Germany	5.0	3.9	-1.04
Slovak Republic	4.6	3.5	-1.05
Spain	4.6	3.5	-1.08
Israel	4.6	3.5	-1.08
USA	4.5	3.5	-1.09
Hungary	4.6	3.5	-1.10
Portugal	4.7	3.6	-1.17
Belgium	5.0	3.8	-1.19
China	5.1	3.9	-1.21
Singapore	5.7	4.5	-1.22
Luxembourg	4.8	3.5	-1.24

[21] Figures refer to estimated average numeric GCSE grade on the 1 to 9 scale.

Reading

Figure 1.5 provides results for FSM pupils estimated GCSE grades in their home language (i.e. English in the case of England). The average GCSE English grade for the FSM group in England is estimated to be 4.0, which is similar to the all-country average of 3.9. This is nevertheless below the leading countries for the language skills of disadvantaged pupils, such as Canada, Finland, Estonia, Norway and the Republic of Ireland. In these comparator nations, the average GCSE grade of disadvantaged pupils is estimated to be around 4.2/4.3.

Again, England compares reasonably well relative to some of the other countries included in our comparison, such as Italy (average home language grade of 3.8), France (3.7) and high-performing China (3.5). Overall, this indicates that FSM pupils' performance in GCSE English is generally similar to the language skills of disadvantaged young people in many other countries, including some with high levels of average performance.

In Figure 1.6 we turn our attention to the gap in home language skills between FSM and non-FSM pupils. In England, the difference between these groups is approximately three-quarters of a GCSE English Language grade. This is of similar magnitude to the all-country average of 0.80. Interestingly, Wales and Northern Ireland are estimated to have a slightly smaller FSM gap than England, with a difference of around two-thirds of a grade. This puts these nations towards the top of the table, with amongst the smallest estimated socio-economic gaps in pupils' English skills. Other countries with a relatively small gap, but who are also high performers (in terms of overall average scores across all pupils), are Estonia and Japan. At the other extreme is countries like Singapore, France, Spain and China, where the estimated gap between disadvantaged and not-disadvantaged pupils is approaching a whole GCSE grade. Nevertheless, taken together, Figures 1.5 and 1.6 paint a reasonably optimistic picture of the GCSE English Language performance of England's FSM pupils.

Figure 1.5: Estimated distribution of GCSE home language grades for FSM pupils across countries[22]

Country	Grade 1 to 3	Grade 4 to 6	Grade 7 to 9	Average grade
Canada	32%	54%	13%	4.3
Finland	34%	53%	13%	4.3
Estonia	35%	54%	11%	4.2
Ireland	35%	54%	11%	4.2
Norway	33%	53%	13%	4.2
Northern Ireland	33%	53%	14%	4.1
Japan	38%	51%	11%	4.1
Singapore	39%	49%	12%	4.1
Hong Kong	36%	53%	11%	4.1
New Zealand	40%	49%	10%	4.0
Macao	37%	53%	10%	4.0
Iceland	37%	51%	11%	4.0
Scotland	41%	49%	11%	4.0
South Korea	37%	53%	10%	4.0
Russia	38%	53%	10%	4.0
Denmark	37%	52%	11%	4.0
England	40%	50%	10%	4.0
Netherlands	39%	50%	11%	4.0
Australia	41%	49%	10%	4.0
Sweden	40%	49%	11%	4.0
Poland	40%	51%	9%	4.0
Slovenia	40%	50%	10%	3.9
Germany	40%	49%	11%	3.9
Wales	42%	50%	7%	3.9
Taiwan	41%	50%	9%	3.9
Belgium	43%	47%	9%	3.9
Switzerland	45%	47%	8%	3.9
USA	45%	47%	8%	3.8
Austria	44%	47%	8%	3.8
Italy	46%	45%	9%	3.8
Czech Republic	45%	46%	9%	3.7
Latvia	44%	48%	7%	3.7
France	46%	45%	9%	3.7
Israel	48%	44%	8%	3.7
Portugal	47%	46%	8%	3.7
Spain	48%	45%	7%	3.7
Luxembourg	53%	41%	6%	3.6
Greece	52%	42%	6%	3.5
Hungary	53%	41%	6%	3.5
China	53%	41%	6%	3.5
Vietnam	51%	45%	4%	3.4
Slovak Republic	32%	41%	6%	3.4
Turkey	32%	35%	3%	3.0
Mexico	65%	33%	2%	2.9

[22] Figures based upon equivalences between old alphabetic GCSE grades and new numeric GCSE grades. Grades A*/A are equated to grades 7/8/9, grades B/C are equated to grades 4/5/6 and grades D and below equated to grades 1/2/3. See Appendix B for results presented in terms of alphabetic grades.

Figure 1.6: The estimated gap in average GCSE home language grades between FSM and non-FSM pupils across countries[23]

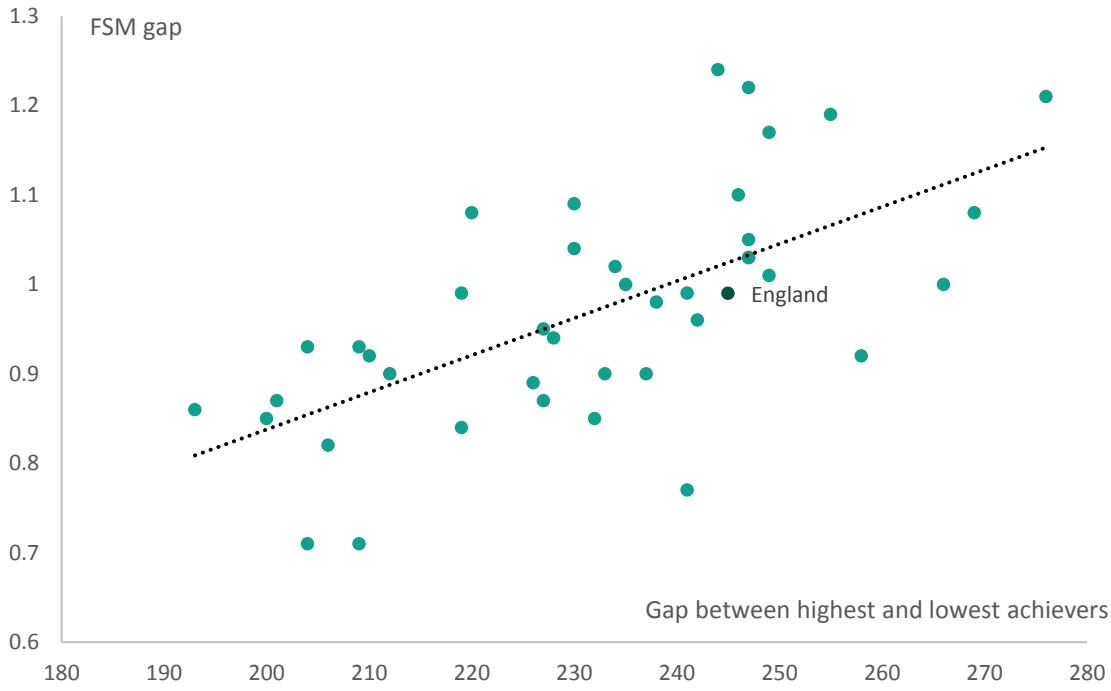
Country	Not FSM pupils	FSM pupils	FSM gap
Macao	4.6	4.0	-0.57
Wales	4.5	3.9	-0.64
Estonia	4.9	4.2	-0.66
Northern Ireland	4.8	4.1	-0.66
Vietnam	4.1	3.4	-0.68
Russia	4.7	4.0	-0.68
Scotland	4.7	4.0	-0.68
Japan	4.8	4.1	-0.68
Poland	4.7	4.0	-0.69
Iceland	4.7	4.0	-0.71
Taiwan	4.6	3.9	-0.72
Latvia	4.4	3.7	-0.72
Hong Kong	4.8	4.1	-0.72
South Korea	4.8	4.0	-0.75
Turkey	3.7	3.0	-0.75
England	4.7	4.0	-0.76
Ireland	4.9	4.2	-0.76
Canada	5.1	4.3	-0.77
Austria	4.6	3.8	-0.79
Finland	5.1	4.3	-0.79
New Zealand	4.8	4.0	-0.79
Mexico	3.7	2.9	-0.80
Italy	4.6	3.8	-0.80
Czech Republic	4.6	3.7	-0.80
Netherlands	4.8	4.0	-0.81
Norway	5.0	4.2	-0.82
Slovenia	4.8	3.9	-0.83
Switzerland	4.7	3.9	-0.84
Australia	4.8	4.0	-0.84
Sweden	4.8	4.0	-0.84
Greece	4.4	3.5	-0.84
Belgium	4.7	3.9	-0.85
Slovak Republic	4.3	3.4	-0.87
USA	4.7	3.8	-0.88
Germany	4.8	3.9	-0.89
Portugal	4.6	3.7	-0.89
Israel	4.6	3.7	-0.89
Hungary	4.4	3.5	-0.90
Denmark	4.9	4.0	-0.91
China	4.4	3.5	-0.92
Spain	4.6	3.7	-0.92
France	4.7	3.7	-0.96
Singapore	5.1	4.1	-0.96
Luxembourg	4.6	3.6	-1.02

[23] Figures refer to estimated average numeric GCSE grade on the 1 to 9 scale.

Overall variation and socio-economic attainment gaps

There are many sources of variation in educational attainment. As reported in OECD (2016), in PISA's 2015 science assessment, 12.9 per cent of the variation in student performance within countries was associated with socio-economic status.[24] As Figure 1.7 highlights, for mathematics, countries with greater overall range in performance (comparing the 10th and 90th percentiles) also tend to have a larger estimated FSM gap, with a 0.65 correlation. From this perspective, England's FSM gap is in line with what would be expected given its overall variation in educational performance, with its combination of FSM gap and the gap between high and low performers close to the line of best fit.

Figure 1.7. The relationship between the high/low achievement gap and the simulated FSM gap across countries (mathematics)

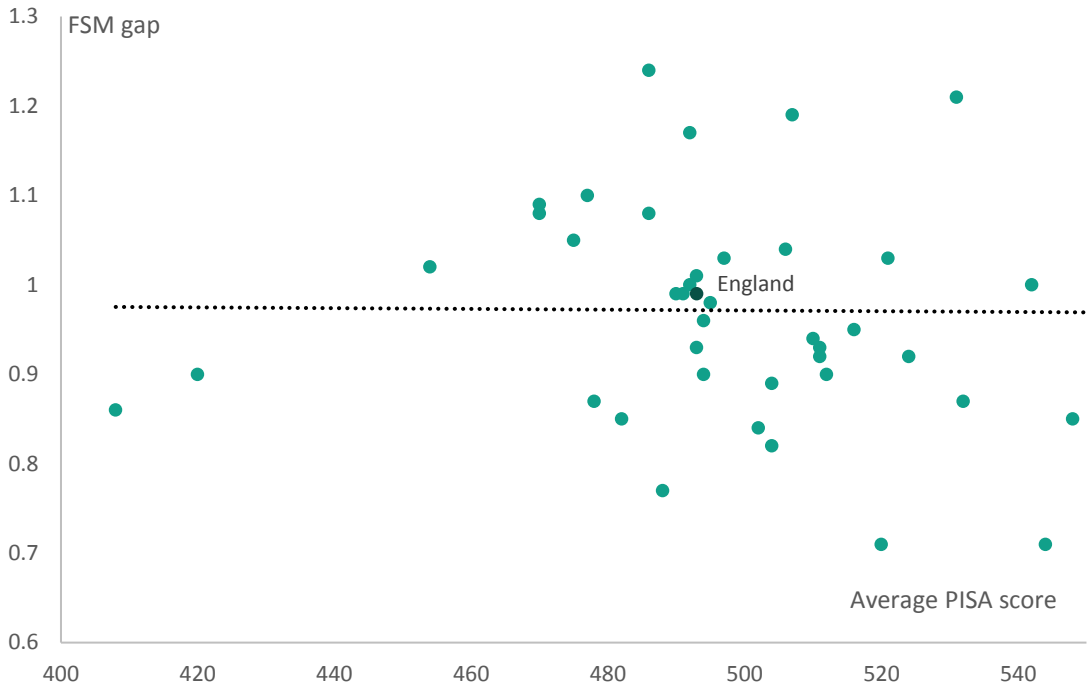


Notes: Horizontal axis refers to the difference in PISA mathematics scores between the 10th and 90th percentile. Vertical axis provides the estimated FSM gap in mathematics scores across countries. Cross-country correlation is 0.65. Analogous results for reading available upon request.

In contrast, as Figure 1.8 highlights, including all countries considered in this study, there is no strong correlation between countries' estimated FSM gaps and the average performance of its pupils. If Turkey and Mexico are excluded, there is a slight negative correlation (of 0.15), with countries with higher average scores also having smaller FSM gaps on average. **It is not the case that developing an education system which prevents large socio-economic gaps precludes the establishment of strong overall educational standards.**

[24] OECD, 'PISA Results 2015: Volume I', December 2016.

Figure 1.8. The relationship between average PISA scores and the simulated FSM gap across countries (mathematics)



Notes: Horizontal axis refers to the average PISA mathematics scores. Vertical axis provides the estimated FSM gap in mathematics scores across countries. Cross-country correlation is -0.01 (-0.15 when the two outliers, Turkey and Mexico, are excluded). Analogous results for reading available upon request.

Part Two: What can we learn from other countries about reducing socio-economic achievement gaps?

Which countries should we compare ourselves with, and why?

The evidence presented in the previous sections highlights why achieving equity is a priority for every school system. Across OECD countries, almost one in every five students does not reach a basic minimum level of skills, while students from low socio-economic backgrounds are twice as likely to be low performers. These factors can lead to higher levels of school drop-out and are linked to long-term negative impacts for individuals and societies; for example in terms of health, crime and employment. But it is also the case that some school systems achieve much better levels of equity and overall performance than others. As the OECD states: "PISA consistently finds that high performance and greater equity in educational opportunities and outcomes are not mutually exclusive".[25]

Using the OECD's definition, equity has two aspects: i) inclusion, meaning that that all individuals reach at least a basic minimum level of skills, and ii) fairness, meaning that personal or social circumstances such as gender, ethnic origin or family background, are not obstacles to achieving educational potential.[26] While the focus in this report on socio-economic gaps might be seen to relate most closely to fairness, in practice it encompasses both aspects. This is particularly true when we consider what England can learn from other countries, where some countries that appear to be strong performers are actually weak on inclusion – for example where high proportions of young people are not included in the PISA assessments because they are not enrolled in school. One example is China, where only 64 per cent of all 15 year-olds in the four participating regions were included in the PISA 2015 assessments.

Taking such factors in to consideration, it is worth asking which systems around the world can be seen as strong on both excellence and equity. Any such analysis must recognise the dangers in comparing different systems, especially given the complex cultural and contextual differences that exist between countries.[27] It is also important to recognise that school and education-specific reforms can only make so much difference, and so must sit within a wider integrated, long-term approach to addressing disadvantage spanning multiple areas of public policy.[28] Nevertheless, there is value in asking how and why different systems perform differently in these important areas and what the implications might be for England.

[25] OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education,* PISA, OECD Publishing, Paris. p.206.
[26] OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing.
[27] Coffield, F. (2012) Why the McKinsey reports will not improve school systems, *Journal of Education Policy*, 27 (1), 131–149.
[28] Wilkinson, R. and Pickett, K. (2010) The Spirit Level: why equality is better for everyone. Penguin: London.

Based on its analysis of PISA 2015, the OECD pinpoints Canada, Denmark, Estonia, Hong Kong and Macao as systems that achieve high performance and high equity overall.[29] In addition, Figure 1.1 above highlights a number of other countries, such as Japan, Finland, Slovenia, Germany, Poland, Ireland and Norway which achieve significantly higher than England and that are also more equitable in one or more respect.[30] This section of the report focusses mostly on evidence from Canada and the northern European countries given their similarities to England in terms of geography, size, history and/or economic development. Where appropriate, we also draw on examples from East Asian systems that are among the highest performing in PISA and also high on equity, such as Japan, Hong Kong and Macao. The evidence is drawn from a focussed search for literature and evidence of policies and practices in these systems, drawing in particular on analyses and comparisons based on PISA.

A framework for addressing equity issues

This section focusses specifically on school and education-related policies and approaches, in particular at secondary level, given that these can be seen to relate most closely to PISA outcomes. But it is important to remember that addressing disadvantage in education requires investment from the early years through to at least upper secondary level, and in alignment with wider policies, for example aimed at reducing child poverty, improving health and well-being and integrating migrant families. For example, the impact of high quality early years provision is well proven, with the greatest impact being for children from disadvantaged backgrounds.[31] Yet, in many systems around the world, children from disadvantaged homes are the least likely to engage in such provision, due to issues of funding and access. By contrast, Macao and Japan – two of the high performing, high equity systems listed above - stand out as systems where advantaged and disadvantaged children are equally likely to attend high quality early years settings.[32] In Denmark, almost all 4-year-olds are enrolled in early childhood education (98 per cent in 2011, above the OECD average of 82 per cent), and a mandatory assessment of language development has been introduced for all three-year-olds since 2010 in order to diagnose and address possible language problems before children start school at age 7.[33]

Turning to schools and education-related policies, the first point to make is that different policy approaches are correlated with different outcomes. The OECD states unambiguously that: "The way education systems are designed has an impact on student performance. More specifically, some systemic practices, such as early tracking, repetition, certain school choice schemes or low quality

[29] OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education,* PISA, OECD Publishing, Paris. p.208.
[30] This list includes all the countries shown in Table 1 that achieve significantly higher than England in maths and/or reading and that also achieve significantly better than England in terms of the gap between highest and lowest achievers and/or the socio-economic gap in one or other subject.
[31] Field, F. (2010) *The Foundation Years: preventing poor children becoming poor adults*: *The report of the Independent Review on Poverty and Life Chances*. London: HM Government.
[32] OECD (2016), *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools,* PISA, OECD Publishing, Paris. p.44.
[33] OECD (2013) *Education Policy Outlook: Denmark*. OECD Publishing: Paris.

vocational education and training tend to amplify social and economic disadvantages and are conducive to school failure".[34]

Building on these insights, we draw on a framework developed by the OECD for addressing equity in education, which focuses on two areas: eliminating system level practices that hinder equity whilst also providing additional support for the most disadvantaged schools.[35] We focus most attention on the areas where policy and practice in England currently differs most significantly from practices in the high performing and high equity countries identified above.

Eliminating system level practices that hinder equity

The OECD suggests the following approaches for eliminating system level practices that hinder equity:

i) Make funding strategies responsive to students' and schools' needs
ii) Manage school choice to avoid segregation and increased inequities
iii) Eliminate grade repetition
iv) Eliminate early tracking/streaming/ability-grouping and defer student selection to upper secondary level

The OECD also argues for designing equivalent upper secondary education pathways (e.g. academic and vocational) in order to ensure high completion rates post-16, but for reasons of space we do not address this priority here.

Make funding strategies responsive to students' and schools' needs

The current funding picture for schools in England is undoubtedly challenging. There are widespread concerns about the overall quantum of funding, with the latest analysis finding that around 40 per cent of maintained schools will struggle to meet the cost of teacher pay pressures in 2018-19 (likely to rise to half of all schools by 2019-20).[36] The impact of the new National Funding Formula being introduced in 2018-19 will be different in different areas, but it will certainly impact negatively on many schools with high levels of deprivation that have enjoyed more generous funding in the past. Nevertheless, based on its analysis of the new funding formula, the Education Policy Institute concludes that: "the Department is right to proceed with a new schools funding formula and… it has resisted pressure to skew funding significantly towards the lowest funded areas, which might have been politically convenient but which would have shifted significant amounts of money away from disadvantaged areas, where attainment gaps are large".[37] The significant funding provided through the Pupil Premium (£2.4bn in 2017-18), which is specifically tied to addressing the needs of children

[34] OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing. p.38.
[35] OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing.
[36] Andrews, J. and Lawrence, T. (2018) *School funding pressures in England*. London: Education Policy Institute
[37] Perera, N. Andrews, J. and Sellen, P. (2017) *The implications of the National Funding Formula for Schools*. London: Education Policy Institute.

on Free School Meals, provides further resources for schools to address disadvantage, although this has been held at a flat per-pupil rate since 2015.

In view of these points, it is arguable that England's funding model is reasonably well aligned with the OECD recommendation above, and with practices in high performing and high equity systems. The OECD draws on responses from head teachers to categorise participating countries in PISA on an Index of Shortage of Educational Resources. It then distinguishes between responses from head teachers in more and less advantaged schools, using the ESCS measure described above.[38] The United Kingdom overall comes out well in this analysis, meaning that disadvantaged schools are more likely than advantaged schools to state that they have sufficient resources. However, an analysis of responses from head teachers in England shows that heads in Ofsted grade 3 and 4 schools (Requires Improvement and Inadequate) were less positive about the physical infrastructure of their schools and about their access to educational resources.[39]

Eliminate grade repetition

Grade repetition, where students who fail end of year exams are required to repeat a year of schooling, remains a common practice in many school systems around the world. However, there is strong evidence that such practices are detrimental to children's long term outcomes.[40] Such approaches have not been a common feature of practice in England for many years and so the level of grade repetition reported in PISA 2015 in England is almost negligible and well below the international average.[41] Several of the high performing systems where such practices remain common are working to reduce this; for example, grade repetition decreased by at least 10% in Macao between 2009 and 2015.[42]

Manage school choice to avoid segregation, defer student selection to upper secondary level and eliminate streaming/setting by ability

The following section focusses on strategies to support schools with large proportions of disadvantaged children, but policy should seek first and foremost to reduce such segregation between schools. This requires attention to school choice and admissions policies, in particular selection by aptitude or ability. The OECD is clear that policy makers should seek to limit both school choice (or, at least, its negative consequences) and selection by ability at an early age.

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[38] OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education,* PISA, OECD Publishing, Paris. p.206. p.231.
[39] Jerrim, J. and Shure, N. (2016) *Achievement of 15-Year-Olds in England: PISA 2015 National Report*. London: Department for Education. p.136.
[40] Hattie, J. (2008) Visible Learning: a synthesis of over 800 meta-analyses relating to achievement. London: Routledge.
[41] OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education,* PISA, OECD Publishing, Paris. p.206. p.232.
[42] OECD (2016), *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools,* PISA, OECD Publishing, Paris. p.18.

School choice policies (which enable parents to select their preferred school and which introduce new schools, such as free schools, to increase choice) are distinct from policies which track or select students by ability or aptitude (for example, between grammar and secondary modern schools on the basis of the 11+ exam in parts of England). Nevertheless, the effect of both policies can be to increase segregation or stratification between schools, with disadvantaged students more likely to be found in less popular schools (in choice-based systems) or less academic schools (in schools which select by ability at an early age).[43] As a result, these less popular and less academic schools can face greater challenges in terms of recruiting high quality teachers or securing improved student outcomes. Furthermore, the OECD finds that: "in countries where schools tend to be more segregated, the impact of the school's socio-economic intake is higher"[44], meaning that schools which serve disproportionate numbers of disadvantaged students are less able to counter the effects of that disadvantage than schools with a more balanced, comprehensive intake.

Where schools are segregated in this way there are generally wide levels of variation in performance between schools, because schools are serving very different populations and struggle to counteract these 'selection effects'. This can be seen in Figure 2.1 below, which shows levels of between and within school variation across participating PISA countries. It shows that systems such as the Netherlands, Germany and Singapore, which have differing levels of overall performance but which all apply early tracking (i.e. selection by ability) for students, all have high levels of between school variation. Similarly, systems such as Chile, which has historically applied market-based choice mechanisms, also have higher than average levels of between school variation.

By contrast, most of the systems highlighted above for being high on both performance and equity, such as Estonia, Finland, Denmark and Canada, have comprehensive admissions models (with limited or no parental choice) and do not permit early tracking or selection by ability. Figure 2.1 shows that the systems with comprehensive admissions models and no early tracking also have lower levels of between school variation than both the OECD average and England (although they also tend to have higher levels of within school variation, because their schools must address wider ability ranges than in selective systems).

The district of Nijmegen in the Netherlands provides one interesting example of how to secure comprehensive admissions. The district has adopted a central subscription system to assign students to primary schools since 2009, with a share of 30 per cent of disadvantaged students in each school. All the primary schools have agreed on the system: in the event of oversubscription, priority is given to siblings and children who live nearby but subsequent priority is given to either advantaged or disadvantaged students, in order to reach the required balance, by lottery system.[45]

[43] OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing. p.58-59.
[44] OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing. p.107.
[45] OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing. p.69.

However, as ever, the picture is complex and there are no simple solutions. There are countries shown in Figure 2.1, such as Latvia, that have lower levels of between school variation than the UK, but that score significantly lower than us overall and in relation to equity. Equally, Japan is a system that performs better than England both overall and in terms of the gap between the highest and lowest achievers, yet it has above average levels of between school variation because schools compete with each other and can choose to apply any selection criteria they wish for admissions.[46]

The UK's level of between school variation is below the OECD average. This reflects the fact that the system remains comprehensive to a large extent and does not allow tracking by ability until age 16, except in areas where there are grammar schools. However, there is emerging evidence that the system in England has become more segregated since 2010,[47] while the recent structural changes, such as enabling academies to act as their own admissions authority and the proposal to let grammar schools expand, could accelerate this shift. Evidence indicates that some popular schools are engaged in 'cream-skimming', to attract more advantaged children, and that increasing numbers of more challenging children are being 'off-rolled', as schools seek to enhance their performance in the accountability framework.[48] Recent analysis suggests that increasing numbers of vulnerable young people – around 48,000 in 2015-16 - are being placed in Alternative Provision schools, often following permanent exclusion from mainstream schools.

A separate, but linked issue is whether and how students are streamed or grouped by ability within individual schools. Such practices are often adopted by schools as a way of addressing within school variation - shown on the left hand side of Figure 2.1 - on the basis that such setting allows for differentiated forms of teaching and curricula for different ability levels. Such practices are near universal in England, with 99 per cent of PISA participants set in some subjects, but much less so in some other school systems – for example, in Finland, 58 per cent of PISA participants were grouped by ability in 2015. There is good evidence that while such practices can benefit higher attaining students, they tend to impact negatively on middle and lower attaining students.[49] This can impact negatively on social justice because of the tendency for certain types of students to be placed in bottom sets: for example, one recent large scale study in England identified that privileged students (White, middle class) were most likely to be in top sets whereas working-class and Black students were more likely to be in bottom sets.[50] There is also evidence that students in lower sets are often less well taught and develop negative self-concepts around their own learning and abilities, although the EEF highlights studies which indicate ways to address such outcomes, such as reducing the size

[46] OECD (2015) *Education Policy Outlook: Japan*. OECD Publishing.

[47] Greany, T. and Higham, R. (in press) *Hierarchy, Markets and Networks: analysing the 'self-improving school-led system' agenda in England and the implications for schools*. IOE Press: London.

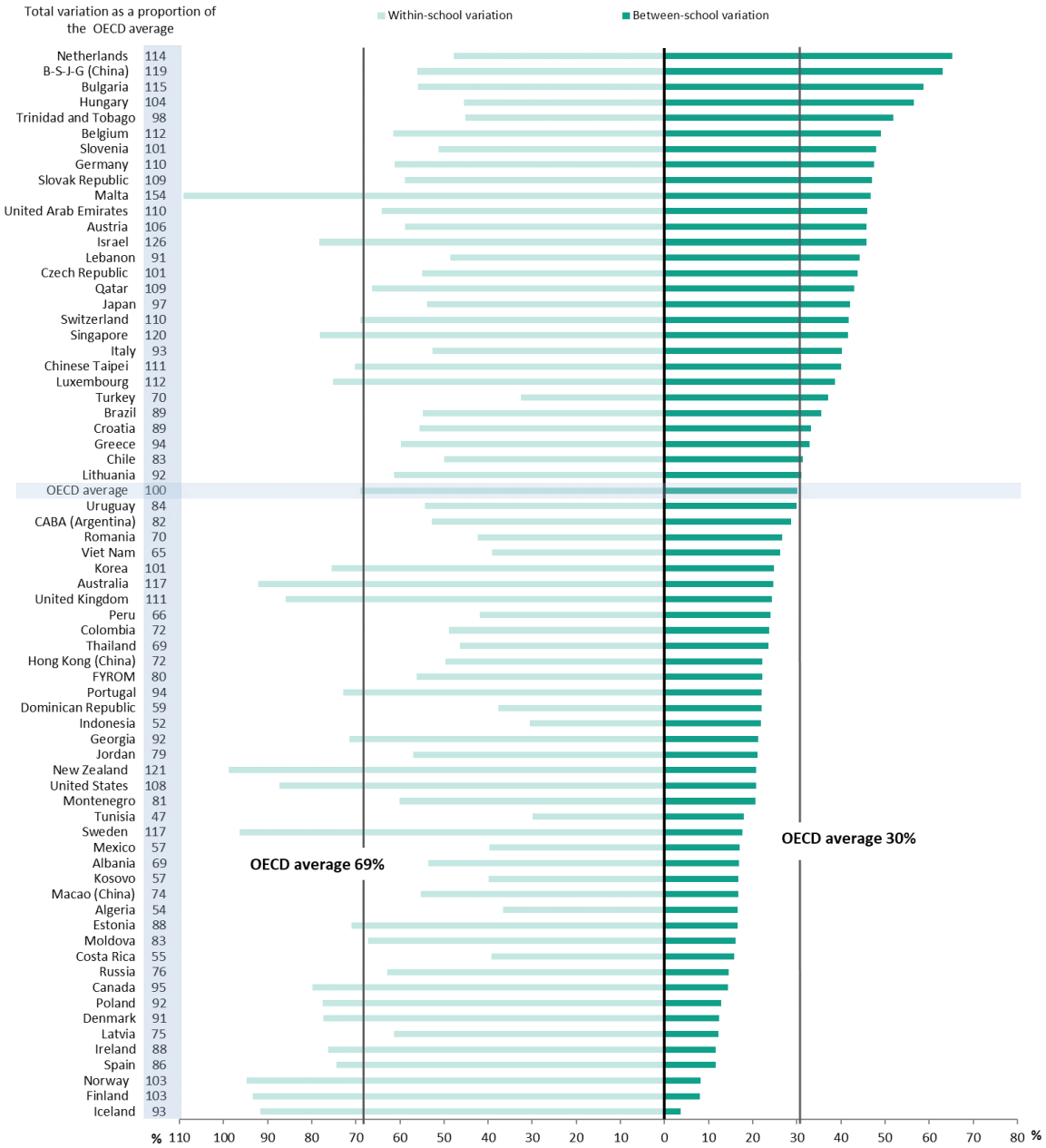
[48] Nye, P. (2017) *Who's left: the main findings* Education DataLab blog article available at: https://educationdatalab.org.uk/2017/01/whos-left-the-main-findings/ accessed 29.3.18

[49] Setting or streaming. Education Endowment Foundation Evidence Summary. https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/setting-or-streaming/ accessed 6.4.18

[50] Archer, L. Francis, B. Miller, S. Taylor, B. Tereshchenko, A. Mazenod, A. Pepper, D. Travers, M. (2018) The symbolic violence of setting: A Bourdieusian analysis of mixed methods data on secondary students' views about setting. *British Educational Research Journal*, 44:1, pp119-140.

of the lowest attaining groups and assigning high-performing teachers to these groups. Nevertheless, the OECD argues that policy makers should seek to limit the use of streaming and ability-grouping within schools, for example by only allowing it within core subjects and/or by ensuring that schools adopt temporary and flexible approaches which allow for regular reviews and movement between groups.[51]

Figure 2.1 Variations in science performance in PISA 2015, between and within schools (from OECD, 2016: 266)



[51] OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing.

Identifying and supporting the most disadvantaged schools

The OECD argues for five focussed strategies in this area[52]:

i) Strengthen and support school leadership
ii) Stimulate a supportive school climate and environment for learning
iii) Attract, support and retain high quality teachers to work in these schools
iv) Ensure effective classroom learning strategies
v) Prioritise linking schools with parents and communities.

In the following sections we briefly review key international learning and implications for England under each of these headings.

Strengthen and support school leadership

It is clear from a range of research that effective leadership has an impact on student outcomes.[53] Robinson et al's meta-review highlights that leaders make the greatest difference to improved pupil outcomes through promoting and participating in professional learning for teachers – reminding us that leadership is first and foremost a process of influence.[54]

Several recent studies have examined the ways in which different school systems are working to strengthen and support school leadership.[55] Some of the world's highest performing school systems are looking beyond rigid competency based approaches to defining and developing leadership. For example, the National Institute of Education in Singapore uses complexity theory to guide the design of its Leaders in Education Programme: using extended in-school projects and action research as a way to develop challenging, dynamic and open ended learning experiences which can develop genuine systemic thinkers for schools.[56]

[52] OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing.

[53] Day, C., Sammons, P., Hopkins, D., Harris, A., Leithwood, K., Gu, Q., Brown, E., Ahtaridou, E. and Kington, A. (2009) *The impact of school leadership on pupil outcomes: Final report*. Nottingham: Department for Education.

[54] Robinson, V., Hohepa, M. and Lloyd, D. (2009) *School leadership and student outcomes: identifying what works and why: Best evidence synthesis*. Wellington, New Zealand: Ministry of Education.

[55] For example: Breakspear S, Peterson A, Alfadala A, Khair M, (2017) *Developing Agile Leaders of Learning: school leadership policy for dynamic times*, WISE Foundation: Doha and Fluckiger, B., Lovett, S., and Dempster, N., (2014) Judging the quality of school leadership learning programmes: an international search, *Professional Development in Education*, 40:4, 561-575.

[56] Jensen B, Downing P, and Clark A, (2017) *Preparing to Lead: Lessons in Principal Development from High-Performing Education Systems.* Washington, DC: National Center on Education and the Economy.

England has invested heavily in development programmes and support for school leadership over the past 15 years, so this could be seen as an area of historic strength.[57] In both PISA and TALIS, school leaders in England report that they focus more time and attention on school self-evaluation, promoting collaborative cultures and improving the quality teaching and learning than in most other high performing systems.[58] However, recent developments in England – most obviously the closure of the National College for Teaching and Leadership, with the associated loss of a national focus for leadership development policy - have raised concerns for some observers.[59]

Stimulate a supportive school climate and environment for learning

The focus in this area is on creating a culture of high expectations in all schools, but particularly those facing high levels of disadvantage, coupled to targeted support for both academic and personal development where required. Again, there has been a significant focus on these issues in England over many years, for example through the establishment of 'floor targets' and an emphasis on progress in the accountability framework, and through different area-based and school-to-school intervention and support programmes, such as the London and City Challenges, the work of National Leaders of Education and, most recently, the expansion of academy sponsorship via Multi-Academy Trusts.

The summary of Ontario's approach to school improvement in Box 1 provides one example of a sustained and successful programme of support for primary and secondary schools in this area. Another example comes from Estonia, which has enacted various ways of supporting weaker students and ensuring equity and inclusiveness in its education system. A yearly development interview for each student is required and schools must implement appropriate measures for students with unsatisfactory year-end marks. Hot school lunches, study books and learning materials have been provided for free to students in basic education since 2006 in an effort to promote equal access to education. All schools in Estonia must have coordinators who provide services to students with special needs. A directive adopted in 2007 mandates additional personalised support to prevent students from dropping out of education. Such support includes special needs education, speech therapy, psychological assistance and social pedagogical counselling. These services are provided through study counselling centres, which have been in place since 2008 and are accessed by rural as well as urban schools.[60]

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[57] Supovitz, J. (2014). *Building a Lattice for School Leadership: The Top to Bottom Rethinking of Leadership Development in England*. Research Report (#RR-83). Philadelphia: Consortium for Policy Research in Education, University of Pennsylvania.

[58] Micklewright, J. Jerrim, J. Vignoles, A. Jenkins, A. Allen, R. Ilie, S. Bellarbre, B, Barrera, F. and Hein, C. (2014) *Teachers in England's Secondary Schools: Evidence from TALIS 2013 Research report.* Institute of Education, University of London. Jerrim, J. and Shure, N. (2016) *Achievement of 15-Year-Olds in England: PISA 2015 National Report*. London: Department for Education.

[59] See, for example: Dunford, J. (2017) 'By doing away with the National College, school leaders' influence on education policy is being minimised' TES opinion piece https://www.tes.com/news/school-news/breaking-views/doing-away-national-college-school-leaders-influence-education accessed 28.3.18

[60] OECD (2016) *Strong performers in PISA 2015 – Estonia.* OECD Publishing.

It remains to be seen whether England's approach to improving its most disadvantaged schools through a combination of MAT sponsorship, school to school support and the focus on Opportunity Areas will prove successful. Building on four years of analysis focussed in particular on impact for disadvantaged students, Hutchings and Francis conclude that there is significant variability within and between academy chains (MATs), but that "the main picture is one of a lack of transformative change over the period."[61]

Supporting school improvement in Ontario, Canada

In Ontario, the Focused Intervention Program provides targeted support to primary schools that have "experienced particular difficulties in achieving continuous improvement", measured through results on provincial assessments of reading, writing, and mathematics (grades 3 and 6). The programme funds are used for professional development, additional student and professional learning resources, literacy and numeracy coaches, and teacher release time for collaboration and additional training. Schools selected for participation in the programme tend to be those serving disadvantaged communities, with a relatively high percentage of students with special education needs or an above-average range of educational challenges. Between 2002/03 to 2010/11, the number of schools with fewer than 34% of students achieving at provincial standard in grade 3 reading was reduced by two thirds (from 19% to 6%), showing significant success in reducing the number of primary schools in which students fail.

Since 2003, Ontario has also implemented the *Student Success / Learning to 18 Strategy* in order to increase graduation rates and post-secondary outcomes. The strategy was introduced in phases, beginning with leadership capacity to promote strong leadership in schools and school boards and to change school culture to achieve long-term systemic improvement. At the school-board level, a new senior leadership role was created, the Student Success Leader, while at school level the Student Success Teacher role was created to provide support to students at risk of dropping out. In addition, secondary schools established Student Success Teams, consisting of school leaders, Student Success Teachers and staff. These teams track and address the needs of students who are disengaged, and also work to establish quality learning experiences for all students.

Additionally, as part of the Ontario *School Effectiveness Framework* (2013), schools set up an *improvement-planning process* and decide how and when they will achieve the goals they select. The objective is to improve student achievement levels by enhancing the way the curriculum is delivered, creating positive environments for learning, and increasing the degree to which parents are involved in children's learning.

According to the Final Report of the *Evaluation of the Ontario Ministry of Education's Student Success / Learning to 18 Strategy*, developing good leadership at all levels – Ministry, school board, and school level – coupled with extensive capacity building were key to the success of the reform. In 2011/12, Ontario had a high-school graduation rate of 83%, a 15 percentage point improvement since 2003/04.

[61] Hutchings, M. & Francis, B. (2017) *Chain Effects 2017: The impact of academy chains on low income students*. London: Sutton Trust. p.5

Adapted from OECD, 2012:118 and OECD, Education Policy Outlook – Canada, 2015:11

Attract, support and retain high quality teachers to work in these schools

It is widely acknowledged that England faces a growing challenge to recruit and retain high quality teachers.[62] In the PISA 2015 survey, 45% of headteachers in England reported that 'teacher shortages' were the greatest barrier to improving outcomes, compared to around 30 per cent for the OECD and the top-performing countries as a group.[63] This issue is often most acute in parts of the country that face the greatest challenges, such as the Opportunity Areas that are often isolated with no obvious mechanisms for recruiting and deploying new teachers. For example, analysis of the School Workforce Census in England indicates that schools with the highest proportion of free school meals-eligible pupils have more than twice as many unqualified teachers as those with the lowest proportion.[64]

The OECD is clear that "the most successful education systems select the best candidates for the teaching profession, retain qualified teachers and ensure that they are constantly improving by participating in professional development activities".[65] It argues that countries which combine equity and high performance are effective in designing mechanisms to attract competent and qualified teachers to disadvantaged schools, although it recognises that this can be complex to address.

There is surprisingly little robust research into different models for initial teacher education and deployment, in particular for disadvantaged schools. Menter et al analyse a range of models and highlight the strength of the Finnish approach, where practical school experience forms a significant component of initial teacher education, partly because universities operate actual 'teaching schools' which enable a close alignment of university and school experience.[66] A recent development has been the focus on 'research informed clinical practice', for example at the University of Melbourne in Australia, which 'seek(s) to integrate practical engagement in schools with research-based knowledge in carefully planned and sequenced ways'.[67]

Beyond initial teacher education, the ongoing development and retention of teachers is clearly critical, with issues such as pay, autonomy, workload and career progression all contributing to

[62] House of Commons Education Select Committee (2017) *Retention and recruitment of teachers.* London.
[63] Jerrim, J. and Shure, N. (2016) *Achievement of 15-Year-Olds in England: PISA 2015 National Report*. London: Department for Education.
[64] Whittaker, F. (2016) 'Grammars taking poorer pupils could face higher teacher turnover'. Schools Week: https://schoolsweek.co.uk/grammars-taking-poorer-pupils-could-face-higher-teacher-turnover/ accessed 28.3.18.
[65] OECD (2016), *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools,* PISA, OECD Publishing, Paris. p. 45.
[66] Menter, M. Hulme, M. Elliot D. and Lewin, J. (2010) *Literature review on teacher education in the 21st Century*. Scottish Government.

[67] Cordingley, P. (2014) 'The contribution of research to teachers' professional learning and development', Research and Teacher Education: the BERA-RSA Inquiry

whether or not teaching is seen to be a rewarding profession. Approaches to teacher development and status have been studied in several of the countries that score most highly on PISA, such as Shanghai and Singapore, where there are formal career structures for teachers with pathways from class subject teacher through to Municipal subject leader.[68] Korea is also interesting in this respect because low socio-economic status students in Korea are actually *more* likely than high socio-economic status' students to be taught by high quality mathematics teachers, as measured by characteristics such as: full certification, mathematics or mathematic education major and at least 3 years of experience. Multiple incentives are offered to candidates who work in high need schools in Korea, for example through additional salary payments, smaller class sizes, less instructional time, additional credit towards future promotion to administrative positions, and the ability to choose the next school where they work.[69]

Looking more specifically at the school systems referenced above as high on both performance and equity, they do generally have strong systems and cultures for teacher development and reward. For example, in Denmark, teachers are considered to be trusted professionals (with self-efficacy above the TALIS average), lower-than-average annual teaching hours (650 compared to the OECD average of 790) and good salary conditions. At upper secondary, Danish teachers must hold a master's degree in a specific subject area and then complete a one-year in-service teacher-training course.[70]

Ensure effective classroom learning strategies

Much has been researched and written about effective classroom pedagogy and it is not the purpose of this report to rehearse these debates in detail.

What is notable from the analyses of PISA is that, on average across OECD nations and in a majority of systems (including the UK), students in socio-economically advantaged schools spend more time in science lessons than their peers in disadvantaged schools. Furthermore, across PISA countries, students score 5 points higher in science for every additional hour of regular science teaching per week after accounting for socio-economic status.[71] In Denmark, for example, the number of days of instruction in general programmes at primary, lower and upper secondary level of education is among the highest in OECD countries (200 days compared to the OECD average of 183-185 days depending on the level of education) and is combined with an above-average number of annual instruction hours for students in primary and lower secondary.[72]

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[68] Jensen, B. Sonnemann, J. Roberts-Hull, K. and Hunter, A. (2016) *Beyond PD: Teacher Professional Learning in High-Performing System.* Washington, DC: National Center on Education and the Economy.

[69] OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing. p.135.

[70] OECD (2014) *Education Policy Outlook: Denmark*. OECD Publishing. p. 10.

[71] OECD (2016), *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools,* PISA, OECD Publishing, Paris. p. 211-212.

[72] OECD (2014) *Education Policy Outlook: Denmark*. OECD Publishing. p. 10.

Prioritise linking schools with parents and communities.

Policy in England since 2010 has focussed on school and teaching-related reforms, with the wider Extended Schools and Every Child Matters agenda pursued by the previous Labour government largely abandoned. Indeed, Multi-Academy Trusts - the key vehicle now used by policy makers to support the majority of lower performing schools – are not required to retain any form of local governance for the schools they support. This is in contrast to most of the other high performing and high equity systems listed above, where disadvantaged schools are usually encouraged and supported to engage with parents and communities.

For example, Nova Scotia, in Canada, has introduced a SchoolsPlus program since 2011. This is a collaborative inter-agency approach to supporting children and their families, with the school as the centre of service delivery. Students and their caregivers get help more quickly, through referral to a wide range of specialist and community services, including crisis intervention, youth mental health, after-school programming, parent and family supports, sexual health, and child care.[73] In the Netherlands, extended schools include other services for children, such as childcare providers, health and welfare services, and sports and cultural institutions. These schools mostly serve disadvantaged students. The purpose of this cooperation is to promote children's development by offering them help where necessary with problems at school or in their home setting, as well as by offering additional activities (*e.g.*, culture, sport), with which they normally have little contact; and in some cases, additional instruction. The concept of the community school comes from an initiative by local stakeholders such as municipalities, school boards and welfare services.[74]

Interestingly, recent research with Charter Management Organisations (CMO), which are similar to MATs in the US (Glazer et al, 2016), indicates that even where the CMO has originally focussed on classroom and school-focussed strategies for turning round schools in disadvantaged communities, it has usually had to become more engaged with the community over time in order to secure legitimacy in the eyes of parents.[75]

[73] OECD (2015) *Education Policy Outlook – Canada*. OECD Publishing.
[74] OECD (2012), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing. p. 126.
[75] Massell, D., Glazer, J. and Malone, M. (2016) *"This is the big leagues" – Charter-led turnaround in a non-charter world*. Tennessee Consortium on Research, Evaluation and Development.

Conclusions and policy implications

Comparing the performance of disadvantaged pupils across different countries, England sits firmly in the middle of this table, with the average GCSE mathematics grade achieved by FSM pupils around 3.8. However, this is more than half a grade lower than in the leading East Asian nations of Macao, Singapore, Hong Kong, Taiwan and Japan.

There are a number of Western nations where low-income pupils perform better than their peers in England, such as Estonia, Canada, the Netherlands, Ireland and Switzerland. Consequently, a significant increase in GCSE mathematics performance – of at least a third of a grade – is needed amongst FSM pupils for disadvantaged young people in England to match their peers in these parts of the world.

The average GCSE English grade for the FSM group in England is estimated to be 4.0, which is similar to the all-country average of 3.9, but below the leading countries for the language skills of disadvantaged pupils, such as Canada, Finland, Estonia, Norway and the Republic of Ireland. Overall, however, England compares reasonably well relative to some of the other countries included in our comparison. The performance of FSM pupils in England, in GCSE English, is generally similar to the language skills of disadvantaged young people in many other countries, including some with high levels of average performance.

In England, the difference between these groups is approximately three-quarters of a GCSE English Language grade. This is of similar magnitude to the all-country average of 0.80. Wales and Northern Ireland are estimated to have a slightly smaller FSM gap than in England, with a difference of around two-thirds of a grade. This puts these nations towards the top of Figure 1.6, with amongst the smallest estimated socio-economic gaps in pupils' English skills.

Other countries with a relatively small gap, but who are also high performers (in terms of overall average scores across all pupils), are Estonia and Japan. At the other extreme is countries like, Singapore, France, Spain and China, where the estimated gap between disadvantaged and not-disadvantaged pupils is approaching a whole GCSE grade.

Countries with greater overall range in performance also tend to have a larger estimated FSM gap. From this perspective, England's FSM gap is in line with what would be expected given its overall variation in educational performance.

There is no strong correlation between countries' estimated FSM gaps and the average performance of its pupils. It is not the case that developing an education system which prevents large socio-economic gaps precludes the establishment of strong educational standards overall. If policy makers in England want to replicate some of the best practice from leading nations, it needs to focus on creating a responsive funding strategy, eliminating selection and the negative impact of school choice and incentivising the recruitment and retention of high quality teachers in the most disadvantaged schools.

Appendix A: Estimated FSM rates for countries' PISA samples

A1: Number and proportion of PISA participants allocated to 'FSM' and 'non-FSM' groups

Country	Non-FSM	FSM	% FSM
Iceland	3099	272	8.1%
Norway	4961	495	9.1%
Sweden	4917	541	9.9%
Canada	18060	1998	10.0%
Wales	3095	356	10.3%
Denmark	6422	739	10.3%
Finland	5272	610	10.4%
England	4648	546	10.5%
Scotland	2776	335	10.8%
Belgium	8599	1052	10.9%
Switzerland	5200	660	11.3%
Israel	5849	749	11.4%
Estonia	4941	646	11.6%
Netherlands	4757	628	11.7%
Northern Ireland	2119	282	11.7%
Singapore	5395	720	11.8%
New Zealand	3986	534	11.8%
Ireland	5051	690	12.0%
Japan	5840	807	12.1%
Germany	5708	796	12.2%
Austria	6148	859	12.3%
Russia	5285	751	12.4%
Australia	12621	1909	13.1%
South Korea	4846	735	13.2%
Slovenia	5521	885	13.8%
Luxembourg	4565	734	13.9%
USA	4916	796	13.9%
Slovak Republic	5465	885	13.9%
Italy	9952	1631	14.1%
Greece	4746	786	14.2%
Czech Republic	5890	1004	14.6%
France	5203	905	14.8%
Taiwan	6560	1148	14.9%
Hungary	4792	866	15.3%
Hong Kong	4528	831	15.5%
Latvia	4027	842	17.3%
Macao	3699	777	17.4%
Poland	3669	809	18.1%
Spain	5519	1217	18.1%
China	7957	1884	19.1%
Portugal	5853	1472	20.1%
Mexico	5474	2094	27.7%
Vietnam	4154	1672	28.7%
Turkey	4149	1746	29.6%
Median	**5126**	**796**	**12.8%**

Appendix B: Alternative results using old GCSE grades

Table B1: Alphabetic GCSE mathematics grades for FSM pupils by country

Country	A Star	A	B	C	D	E and below
Singapore	5%	13%	22%	32%	14%	14%
Macao	4%	12%	26%	35%	13%	11%
Hong Kong	3%	11%	23%	35%	14%	13%
Taiwan	4%	10%	21%	33%	15%	17%
Canada	3%	10%	22%	36%	15%	14%
Estonia	3%	10%	23%	35%	16%	13%
Japan	4%	10%	23%	35%	16%	13%
South Korea	3%	10%	21%	34%	16%	17%
Denmark	3%	9%	23%	36%	16%	14%
Finland	2%	9%	21%	35%	17%	14%
Switzerland	3%	9%	22%	33%	16%	18%
Russia	2%	9%	21%	36%	18%	15%
Norway	2%	8%	20%	35%	17%	17%
Netherlands	3%	8%	21%	34%	17%	17%
Ireland	2%	8%	20%	37%	17%	16%
China	3%	8%	18%	34%	17%	21%
Slovenia	2%	8%	20%	36%	17%	16%
Australia	2%	8%	19%	34%	18%	20%
New Zealand	3%	8%	18%	34%	19%	18%
Italy	2%	7%	17%	34%	19%	21%
Sweden	2%	7%	20%	36%	17%	16%
Scotland	2%	7%	19%	36%	18%	18%
Poland	2%	7%	19%	37%	17%	18%
England	2%	7%	18%	35%	19%	20%
Belgium	2%	7%	19%	32%	18%	21%
France	2%	7%	17%	32%	19%	23%
Germany	2%	7%	20%	34%	18%	18%
Czech Republic	2%	7%	17%	33%	19%	21%
Austria	2%	7%	18%	32%	18%	22%
Iceland	3%	6%	19%	36%	18%	18%
Northern Ireland	2%	6%	18%	37%	18%	19%
Portugal	2%	6%	15%	32%	20%	24%
Latvia	1%	6%	16%	37%	19%	21%
Luxembourg	2%	5%	15%	33%	20%	25%
Spain	1%	5%	15%	36%	21%	22%
Israel	1%	5%	15%	32%	20%	27%
Slovak Republic	1%	5%	15%	33%	20%	25%
Wales	1%	5%	16%	36%	22%	20%
Hungary	1%	5%	14%	33%	21%	26%
Vietnam	1%	5%	13%	35%	21%	25%
USA	1%	5%	14%	35%	19%	26%
Greece	1%	4%	13%	33%	21%	27%
Mexico	0%	2%	9%	27%	25%	37%
Turkey	0%	2%	8%	27%	24%	39%

Table B2: Alphabetic GCSE home language grades for FSM pupils by country

Country	A Star	A	B	C	D	E and below
Canada	2%	12%	24%	30%	20%	12%
Norway	2%	11%	21%	33%	20%	13%
Finland	2%	11%	21%	31%	22%	13%
Northern Ireland	3%	11%	22%	31%	22%	11%
Singapore	2%	11%	19%	30%	23%	16%
Hong Kong	1%	10%	20%	33%	21%	15%
Japan	1%	9%	19%	33%	23%	15%
Scotland	1%	9%	17%	32%	24%	17%
Iceland	2%	9%	19%	32%	23%	14%
Sweden	2%	9%	18%	31%	24%	16%
Estonia	1%	9%	19%	35%	23%	12%
Netherlands	2%	9%	18%	32%	23%	16%
Denmark	2%	9%	19%	33%	23%	14%
Ireland	2%	9%	21%	33%	22%	13%
South Korea	1%	9%	19%	34%	22%	15%
Germany	2%	9%	19%	30%	24%	16%
Macao	1%	9%	18%	35%	23%	14%
Australia	1%	9%	19%	30%	24%	17%
New Zealand	2%	9%	18%	32%	25%	16%
Russia	1%	9%	19%	34%	24%	13%
Slovenia	1%	9%	18%	32%	25%	15%
England	1%	8%	18%	33%	24%	16%
Poland	1%	8%	18%	33%	23%	17%
Belgium	1%	8%	17%	31%	26%	18%
Taiwan	1%	8%	17%	33%	23%	18%
France	1%	8%	15%	29%	25%	21%
Czech Republic	1%	8%	15%	31%	26%	19%
Italy	1%	8%	15%	30%	26%	20%
Switzerland	1%	7%	15%	32%	25%	20%
Austria	1%	7%	17%	30%	25%	19%
USA	1%	7%	17%	30%	25%	19%
Israel	1%	7%	15%	29%	26%	22%
Portugal	1%	7%	14%	32%	27%	19%
Latvia	1%	7%	16%	33%	25%	19%
Wales	1%	6%	17%	33%	27%	16%
Spain	1%	6%	15%	30%	27%	21%
Luxembourg	1%	6%	14%	27%	27%	25%
China	1%	6%	12%	28%	27%	26%
Greece	1%	5%	13%	29%	28%	25%
Hungary	1%	5%	12%	30%	28%	25%
Slovak Republic	1%	5%	12%	29%	27%	26%
Vietnam	1%	4%	14%	31%	29%	21%
Turkey	0%	3%	9%	26%	33%	30%
Mexico	0%	2%	8%	26%	29%	36%