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Programme for International Student Assessment (PISA) 2018: Highlights from Scotland's results



CHILDREN, EDUCATION AND SKILLS



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Main Messages

Overall performance

- Scotland's scores in the 2018 PISA assessments were above the OECD average in reading and similar to the OECD average in maths and science. In the previous survey in 2015, Scotland was similar to the OECD average in reading, maths and science.
- Scotland's own overall performance compared to 2015 improved in reading and was similar in maths and science.
- Scotland's relative performance compared to other countries, including UK administrations, improved in reading, stayed similar in science and declined in maths when measured by the number of comparator countries that were above and below Scotland.
- The proportion of pupils performing at highest levels of achievement ("Level 5 and above") was higher in Scotland than the OECD average in reading and similar in maths and science. The proportion of pupils performing at the lowest levels of achievement ("below Level 2") were lower in Scotland than the OECD average in reading and similar in maths and science.
- The gradient and strength of relationship between performance and social background was similar to 2015. However, despite an improvement in reading performance, the gradient and strength of relationship remained below the OECD average. The strength of relationship between performance and social background in maths was lower than the OECD average in 2018.

Scotland's performance in reading

- **In reading, Scotland's performance was higher in 2018 than it was in 2015.** It is now similar to 2012, 2009, 2006, and 2003 but still lower than 2000.
- **In reading, Scotland's performance in 2018 was above the OECD average.** Scotland's performance was previously similar to the OECD average in 2015.
- The proportion of high performers **was higher than in 2015** and above the OECD average. The proportion of low performers **was similar to 2015, 2012, 2009 and 2006**, and was lower than the OECD average.
- **Scotland's relative position** compared to OECD countries and UK administrations **improved since 2015** with five countries outperforming Scotland, the lowest number since 2003. Scotland's performance in reading was similar to 11 countries and higher than 22 countries.

- **The *strength* of relationship between social disadvantage and a pupil's score was lower in Scotland than the OECD average.** About 8 per cent of the variation in Scotland could be explained by socio-economic factors. This was similar to the position for reading in 2015 (9 per cent) and 2012 (11 per cent), but less than 2009 (14 per cent). 17 countries had a stronger relationship than Scotland, 20 countries had a similar relationship and one country (Wales) had a weaker relationship.
- **The *extent* of the relationship between deprivation and reading performance (or “gradient”) in Scotland was lower than the OECD average** at around 32 points. This is similar to 2015 (32 points) and 2012 (35 points) but better than 2009 (44 points). Scotland's gradient was lower than 16 countries, similar to 20 countries and higher than two countries.

Scotland's performance in maths

- **In maths, Scotland's performance was similar to 2015, 2012 and 2009** but lower than 2006 and 2003. Scores in 2000 were not comparable.
- **In maths, Scotland's performance in 2018 was similar to the OECD average.** This has been the case in each PISA round since 2006.
- The proportion of low performers in Scotland was similar to 2015, but higher than in 2012. It was similar to the OECD average. The proportion of high performers was similar to every PISA round since 2006 and similar to the OECD average.
- **Scotland's relative position** compared to OECD countries and UK administrations **declined since 2015**, with 18 countries outperforming Scotland and seven performing below Scotland. Scotland's performance was similar to 14 countries.
- **The *strength* of relationship between social disadvantage and a pupil's score in Scotland was lower than the OECD average.** About 8 per cent of the variation in Scotland could be explained by socio-economic factors. This was similar to the position for maths in 2015 (11 per cent) and 2012 (13 per cent), but represents an improvement on 2009 (16 per cent). 18 countries had a stronger relationship than Scotland, 21 had a similar relationship and no countries had a weaker relationship.
- **The *extent* to which disadvantage was related to performance (or “gradient”) in Scotland was similar to the average across OECD countries** and amounted to around 31 points. This is similar to 2015 and 2012, but **still represents an improvement on 2009** when the effect of deprivation was larger

(45 points). Scotland's gradient was lower than nine countries, similar to 30 countries and higher than no countries.

Scotland's performance in science

- In science, **Scotland's performance was similar to 2015 and lower than 2012, 2009 and 2006.** Scores for previous rounds (2000 and 2003) were not comparable.
- In science, **Scotland's performance in 2018 was similar to the OECD average.** This was also the case in 2015, but in 2012, 2009 and 2006 it was higher than the OECD average.
- The proportion of low performers in Scotland was similar to 2015, but higher than 2012. It was similar to the OECD average. The proportion of high performers was similar to 2015 and 2012 and was similar to the OECD average, but was lower than 2009 and 2006.
- Scotland's relative position compared to OECD countries and UK administrations was similar to 2015, with 13 countries outperforming Scotland and 11 performing below Scotland. Scotland's performance was similar to 15 countries.
- **The strength of relationship between social disadvantage and a pupil's score in Scotland was similar to the OECD average.** About 10 per cent of the variation in Scotland could be explained by socio-economic factors. This was similar to 2015 and 2012, but an improvement on 2009 (16 per cent). Nine countries had a stronger relationship than Scotland, 30 had a similar relationship and no countries had a weaker relationship.
- The *extent* to which disadvantage was related to performance (or "gradient") in Scotland was also similar to the average across OECD countries and amounts to around 36 points. This is similar to 2015 and 2012 **but still represents an improvement on 2009** when the effect of deprivation was larger (47 points). Scotland's gradient was lower than four countries, similar to 30 countries and higher than five countries.

1. Introduction and Methodology

What is PISA?

1. The Programme for International Student Assessment (PISA) is an assessment of 15 year-olds' skills carried out under the auspices of the Organisation for Economic Co-operation and Development (OECD). The programme runs every three years across all OECD members and a variety of partner countries. Scotland has participated in all seven surveys since the first wave of testing in 2000.
2. Each survey cycle focusses on one of three domains: reading, mathematics and science. In 2018 the main domain was reading, with maths and science as subsidiary domains. Data and analysis on global competence (the "innovative domain" in PISA 2018) will be published during 2020.

Who participates?

3. Around 600,000 students participated in the study worldwide, representing about 32 million 15 year olds. In 2018, 79 countries and economies participated in PISA.

Fig. 1.1: Global coverage of PISA 2018

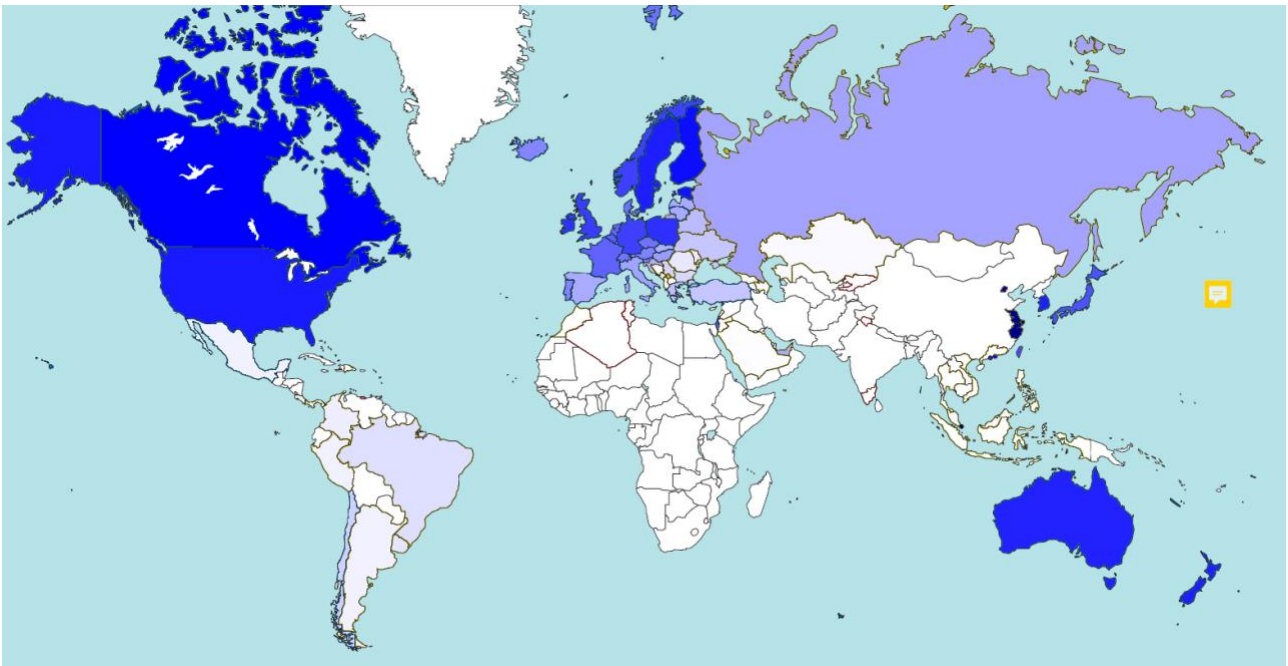


Table 1.1: OECD states and partner countries and “economies” participating in PISA 2018

OECD countries		Partner countries and economies	
Australia	Japan	Albania	Macao (China)
Austria	Korea	Azerbaijan (Baku City)	Malaysia
Belgium	Latvia	Argentina	Malta
Canada	Lithuania	Belarus	Moldova
Chile	Luxembourg	Bosnia & Herzegovina	Montenegro
Colombia	Mexico	Brazil	Morocco
Czech Republic	Netherlands	Brunei	Panama
Denmark	New Zealand	Darussalam	Peru
Estonia	Norway	Bulgaria	Qatar
Finland	Poland	China (People’s Republic of)	Republic of North Macedonia
France	Portugal	Chinese Taipei	Panama
Germany	Slovak Republic	Costa Rica	Peru
Greece	Slovenia	Croatia	Qatar
Hungary	Spain	Dominican Republic	Romania
Iceland	Sweden	Georgia	Russian Federation
Ireland	Switzerland	Hong Kong (China)	Saudi Arabia
Israel	Turkey	Indonesia	Singapore
Italy	United Kingdom	Jordan	Thailand
	United States	Kazakhstan	Ukraine
		Kosovo	United Arab Emirates
		Lebanon	Uruguay
			Viet Nam

4. The United Kingdom is a member state of the OECD and its results are published in the main OECD publication. Scotland participates as an “adjudicated region”, meaning that its results have full quality assurance from the survey contractors appointed by the OECD, and can publish its results separately. Within the UK, England, Wales and Northern Ireland have boosted samples as “non-adjudicated regions” which means they are able to produce country-level analysis within their reports. Regional results are published as annexes to the main OECD volumes.
5. Survey fieldwork is carried out separately in each participating state by “National Centres” according to strict quality standards set by the OECD.
6. Results based on reading performance are reported as missing for Spain. Spain’s data met PISA 2018 Technical Standards, however due to some implausible response behaviour amongst students the OECD is unable to assure that international, subnational and trend comparisons of Spain’s

results lead to valid conclusions about students' reading proficiency. PISA 2018 reading results for Spain are therefore not available and are not included in OECD average results.

What does PISA measure?

7. PISA seeks to measure skills which are necessary for participation in society. Accordingly, it assesses how students apply the skills they have gained to the types of problem they may encounter in work or elsewhere. Pupils are assessed at the age of 15 as this is regarded as a reasonable point at which to test the impact of compulsory education throughout the developed world. After this point students will typically move onto more specialised studies or enter the labour market. Box 1.1 contains the definitions of the domains tested by PISA.

Box 1.1: The PISA domains and their definition

Reading literacy is defined as students' capacity to understand, use, evaluate, reflect on and engage with texts in order to achieve one's goals, develop one's knowledge and potential, and participate in society.

Mathematical literacy is defined as students' capacity to formulate, employ and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena.

Science literacy is defined as the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen. A scientifically literate person is willing to engage in reasoned discourse about science and technology, which requires the competencies to explain phenomena scientifically, evaluate and design scientific enquiry, and interpret data and evidence scientifically.

8. We have included some details on how reading, the main focus of the 2018 PISA survey, was assessed in Chapter 2. Further details of how each domain was assessed can be found in the OECD volumes published on the PISA website, www.oecd.org/pisa.
9. The assessments are also supplemented by background questionnaires. Pupils are asked about their motivations for study, attitudes to school, views on reading, and their socio-economic background. Headteachers are asked about the challenges facing their schools, organisation and factors that they believe affect their students' performance.

The survey in Scotland

10. The PISA survey was managed by an international consortium led by ETS. The Consortium developed the tests, questionnaires and survey documentation and ensured that all participating countries met quality standards. In Scotland, the National Foundation for Educational Research (NFER) was the “National Centre”, responsible for local adaptations to the surveys, and administering the test in schools.
11. The school sample was randomly selected by NFER following submission of sampling forms to the consortium. The sample was stratified on the basis of previous exam performance (split into five categories), whether schools were publicly funded or independent, urban/rural location and school size, and whether schools were single-sex or mixed.
12. The survey was carried out in Scotland between 8 October and 14 December 2018. In total, 107 secondary schools participated in the survey. One hundred of these were from the main sample (86 per cent response rate), and seven from the back-up samples (resulting in a 90 per cent weighted participation rate after replacements were added in). This exceeded the OECD’s minimum standard of 85 per cent participation.
13. Within each school 40 students were randomly sampled by NFER using software supplied by the Consortium. In total 4,265 students were drawn in the sample. Schools were able to withdraw a certain number of students where it was deemed that participation would be difficult due to additional support needs or language issues. Similarly students that had left the school in the interim were not considered part of the target sample. In total 3,767 students were deemed eligible participants. Of these a total of 2,969 students took part, with the balance being those who did not wish to take part (both students and their parents were given the opportunity to opt out of the survey), those who were absent on the day of the test or were withdrawn by the school because of their additional support needs.
14. The OECD had strict criteria for the level of exclusion that was acceptable, and the total exclusion rate of 5.39 per cent was deemed to be consistent with a robust sample. Similarly, the final weighted participation rate, calculated by the consortium, was 80.51 per cent, which met the OECD requirement of 80 per cent.
15. The assessment was administered in Scotland by computer. This was achieved using the existing facilities in schools with the support of school and Local Authority ICT services.
16. The software delivery system was provided by the international consortium. The assessment was administered in two one-hour sessions, with a further 35 minutes for the background questionnaire. Students spent one hour on the reading assessment (composed of a core stage followed by two stages of

either greater or lesser difficulty) plus one hour on one or two other subjects – mathematics, science or global competence.

17. As in all previous cycles, there was a survey of headteachers within schools, which asked about their views on school organisation, teaching staff and resources. Eighty-seven headteachers responded – a response rate of 81.3 per cent.
18. In 2018, Scotland also participated in the Teacher Questionnaire, which was undertaken by 19 countries and economies in total. Questions asked about initial teacher education and professional development, their beliefs and attitudes, and their teaching practices. Separate questionnaires were developed for teachers of the main domain (for PISA 2018, this is teachers of English) and for other teachers in the school. The teacher questionnaire took 45 minutes to complete and was sent to 30 teachers in each of the schools included in the PISA assessment. 1,445 teachers completed the questionnaire, a response rate of 51 per cent. The results from the teacher questionnaire will be published in a separate report in 2020.

Interpreting the results

19. It should be understood that PISA is a sample survey. Like all surveys of this type, it is subject to sampling error. The necessity of surveying only a sample of students, even when chosen at random, runs the risk that such a group will not necessarily reflect the larger population of students. We therefore cannot assume that the values found in the survey are the same as those in the population. Confidence intervals are presented around mean scores; we can be 95% sure that the true value lies within this range.
20. This means that being confident that there is a difference between Scotland and the OECD average, or between groups and countries, will depend on both the size of the observed difference in mean scores and the associated standard error. Significance tests are used to assess the statistical significance of comparisons made.
21. It is not possible to produce individual country rankings based on the absolute (mean) score. Accordingly this report shows results divided into those countries whose scores are statistically significantly higher than, similar to or lower than Scotland. By “statistically significant” we mean that we are 95 per cent certain that there is a difference (or similarity).

Change over time

22. This report covers, as in previous publications, the position of Scotland relative to other countries, and how this has changed over time. The mathematics assessment changed radically in 2003 and for science in 2006, as they became “full domains” for the first time, so we are unable to make comparisons before those waves.

23. One complication is that membership of the OECD has changed at various points. In 2010, Chile, Estonia, Israel and Slovenia were admitted to membership. This affected comparison of reading scores in 2009.¹ Scotland was above the OECD average when those four countries were included, but similar to the average of the pre-2010 membership. Since PISA 2015, Latvia (2016), Lithuania (2018) and Colombia (2019) have joined or been invited to join the membership of the OECD. When making comparisons with the OECD average, this report defines this as the average of member nations of the OECD at the time.
24. Further, the measurement of performance can be affected by new test items, the change of administration from paper- to computer-based assessment and the statistical treatment of data. While the scales have been equated to allow for expression on the same basis between cycles, the OECD provide a “link error” to quantify the uncertainty when comparing scores over different waves of data. All estimates in this report have taken this into account.

Further analysis of PISA

25. Much of this report focusses on changes to Scotland’s mean score and the relative position internationally. However, PISA is not just a snapshot of student attainment, but a comprehensive data-gathering exercise which enables analysis, not only of how well school systems around the world perform, but the factors that are behind this. The OECD publications present international analysis of students’ abilities, motivations, attitudes, background, support at home and confidence. In addition, information is gathered on school structure and management, and the OECD analyse how various aspects of school organisation may be related to attainment.
26. The OECD will publish further volumes of PISA 2018 data, including on the Global Competence Innovative Domain, during 2020.
27. Periodically, the OECD also publish short reports in their “PISA in Focus” series at the following link: <http://www.oecd.org/pisa/pisaproducts/pisainfocus.htm>

¹ Although the four countries joined the OECD in 2010, they were included as OECD members in the PISA reports for the 2009 round. Latvia was also included for 2015.

2. How Reading is Assessed

1. PISA assesses reading literacy, as opposed to reading. Reading is often interpreted as reading aloud or simply converting text into sounds; reading literacy, on the other hand, is a broader set of competencies that allows readers to engage with written information, presented in one or more texts, for a specific purpose.
2. To do so, readers must understand what is written and integrate this with their pre-existing knowledge. They must examine the author's (or authors') point of view and decide whether the text is reliable and truthful, and whether it is relevant to their goals or purpose.
3. PISA also recognises that reading is a daily activity for most people, and that education systems need to prepare students to be able to adapt to the variety of scenarios in which they will need to read as adults. These scenarios range from their own personal goals and development initiatives, to their interactions at work, with public entities, in online communities and with society at large. It is not enough to be a proficient reader; students should also be motivated to read and be able to read for a variety of purposes.
4. All of these considerations are reflected in the PISA 2018 definition of reading literacy:

Reading literacy is understanding, using, evaluating, reflecting on and engaging with texts in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society.

5. Below, we summarise key features of the OECD's framework for assessing reading.

The PISA 2018 framework for assessing reading

For PISA 2018, the reporting subscales are:

- 1) **Locating information**, which is composed of tasks that require students to search for and select relevant texts, and access relevant information within texts;
- 2) **Understanding**, which is composed of tasks that require students to represent the explicit meaning of texts as well as integrate information and generate inferences; and
- 3) **Evaluating and reflecting**, which is composed of tasks that require the student to assess the quality and credibility of information, reflect on the content and form of a text and detect and handle conflict within and across texts.

6. Questions are constructed to test each of these categories, and at varying levels of difficulty, in order to identify a student's ability. Their score corresponds to levels of ability, which are summarised in Table 2.1 below. Example questions and how they were adapted for computer-based assessment are provided in Annex C of Volume I of the OECD report.

Table 2.1: Proficiency levels in reading, and what they mean

Level	Lower score limit	Characteristics of tasks
6	698	Readers at Level 6 can comprehend lengthy and abstract texts in which the information of interest is deeply embedded and only indirectly related to the task. They can compare, contrast and integrate information representing multiple and potentially conflicting perspectives, using multiple criteria and generating inferences across distant pieces of information to determine how the information may be used. Readers at Level 6 can reflect deeply on the text's source in relation to its content, using criteria external to the text. They can compare and contrast information across texts, identifying and resolving inter-textual discrepancies and conflicts through inferences about the sources of information, their explicit or vested interests, and other cues as to the validity of the information. Tasks at Level 6 typically require the reader to set up elaborate plans, combining multiple criteria and generating inferences to relate the task and the text(s). Materials at this level include one or several complex and abstract text(s), involving multiple and possibly discrepant perspectives. Target information may take the form of details that are deeply embedded within or across texts and potentially obscured by competing information.
5	626	Readers at Level 5 can comprehend lengthy texts, inferring which information in the text is relevant even though the information of interest may be easily overlooked. They can perform causal or other forms of reasoning based on a deep understanding of extended pieces of text. They can also answer indirect questions by inferring the relationship between the question and one or several pieces of information distributed within or across multiple texts and sources. Reflective tasks require the production or critical evaluation of hypotheses, drawing on specific information. Readers can establish distinctions between content and purpose, and between fact and opinion as applied to complex or abstract statements. They can assess neutrality and bias based on explicit or implicit cues pertaining to both the content and/or source of the information. They can also draw conclusions regarding the reliability of the claims or conclusions offered in a piece of text. For all aspects of reading, tasks at Level 5 typically involve dealing with concepts that are abstract or counterintuitive, and going through several steps until the goal is reached. In addition, tasks at this level may require the reader to handle several long texts, switching back and forth across texts in order to compare and contrast information
4	553	At Level 4, readers can comprehend extended passages in single or multiple-text settings. They interpret the meaning of nuances of language

		<p>in a section of text by taking into account the text as a whole. In other interpretative tasks, students demonstrate understanding and application of ad hoc categories. They can compare perspectives and draw inferences based on multiple sources. Readers can search, locate and integrate several pieces of embedded information in the presence of plausible distractors. They are able to generate inferences based on the task statement in order to assess the relevance of target information. They can handle tasks that require them to memorise prior task context. In addition, students at this level can evaluate the relationship between specific statements and a person's overall stance or conclusion about a topic. They can reflect on the strategies that authors use to convey their points, based on salient features of texts such as titles and illustrations. They can compare and contrast claims explicitly made in several texts and assess the reliability of a source based on salient criteria. Texts at Level 4 are often long or complex, and their content or form may not be standard. Many of the tasks are situated in multiple-text settings. The texts and the tasks contain indirect or implicit cues.</p>
3	480	<p>Readers at Level 3 can represent the literal meaning of single or multiple texts in the absence of explicit content or organisational clues. Readers can integrate content and generate both basic and more advanced inferences. They can also integrate several parts of a piece of text in order to identify the main idea, understand a relationship or construe the meaning of a word or phrase when the required information is featured on a single page. They can search for information based on indirect prompts, and locate target information that is not in a prominent position and/or is in the presence of distractors. In some cases, readers at this level recognise the relationship between several pieces of information based on multiple criteria. Level 3 readers can reflect on a piece of text or a small set of texts, and compare and contrast several authors' viewpoints based on explicit information. Reflective tasks at this level may require the reader to perform comparisons, generate explanations or evaluate a feature of the text. Some reflective tasks require readers to demonstrate a detailed understanding of a piece of text dealing with a familiar topic, whereas others require a basic understanding of less-familiar content. Tasks at Level 3 require the reader to take many features into account when comparing, contrasting or categorising information. The required information is often not prominent or there might be a fair amount of competing information. Texts typical of this level may include other obstacles, such as ideas that are contrary to expectation or negatively worded.</p>
2	407	<p>Readers at Level 2 can identify the main idea in a piece of text of moderate length. They can understand relationships or construe meaning within a limited part of the text when the information is not prominent by producing basic inferences, and/or when the information is in the presence of some distracting information. They can select and access a page in a set based on explicit though sometimes complex prompts, and locate one or more pieces of information based on multiple, partly implicit criteria. Readers at Level 2 can, when explicitly cued, reflect on the overall purpose, or on the purpose of specific details, in texts of moderate length. They can reflect on simple visual or typographical features. They</p>

		can compare claims and evaluate the reasons supporting them based on short, explicit statements. Tasks at Level 2 may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require readers to make a comparison or several connections between the text and outside knowledge by drawing on personal experience and attitudes.
1a	335	Readers at Level 1a can understand the literal meaning of sentences or short passages. Readers at this level can also recognise the main theme or the author's purpose in a piece of text about a familiar topic, and make a simple connection between several adjacent pieces of information, or between the given information and their own prior knowledge. They can select a relevant page from a small set based on simple prompts, and locate one or more independent pieces of information within short texts. Level 1a readers can reflect on the overall purpose, gist and adjunct information in simple texts containing explicit cues. Most tasks at this level point to relevant factors in the task and in the text.
1b	262	Readers at Level 1b can evaluate the literal meaning of simple sentences. They can also interpret the literal meaning of texts by making simple connections between adjacent pieces of information in the question and/or the text. Readers at this level can scan for and locate a single piece of prominently placed, explicitly stated information in a single sentence, a short text or a simple list. They can access a relevant page from a small set based on simple prompts when explicit cues are present. Tasks at Level 1b explicitly direct readers to consider relevant factors in the task and in the text. Texts at this level are short and typically provide support to the reader, such as through repetition of information, pictures or familiar symbols. There is minimal competing information.
1c	189	Readers at Level 1c can understand and affirm the meaning of short, syntactically simple sentences on a literal level, and read for a clear and simple purpose within a limited amount of time. Tasks at this level involve simple vocabulary and syntactic structures.

Source: OECD

3. How results are displayed in this report

3.1 What measures are used

Statistical Significance – This report shows results divided into those countries whose scores are statistically significantly higher than, similar to or lower than Scotland. By “significant” we mean that we are 95 per cent certain that there is a difference (or similarity).

Throughout this report, if one result is described as ‘higher’ than another, it means it is statistically significantly higher. If there is no statistically significant difference between results they are described as ‘similar’ and if one result is described as ‘lower’ than another, it means it is statistically significantly lower.

Link Error – For most of the year on year comparisons in this report, a **link error** is applied to tests for statistical significance. The OECD provide this to quantify the uncertainty when comparing scores over different waves of data (e.g. 2018 v 2015).

In this report, the link error is important when comparing 2018 reading results with 2003 reading results. From Chart 4.1.1 it appears as though 2003 reading results are statistically significantly higher than 2018 reading results, but due to a large link error between 2003 and 2018, the results are statistically similar.

Mean PISA score – this is the overall PISA score and is the main result used to assess how Scotland’s education system is performing. Mean PISA score can be calculated for different characteristics (e.g. gender, immigration background and ESCS group).

Standard Deviation – this is a measure of the spread of the results within a country. A higher standard deviation indicates more variation in the results (i.e. a larger proportion of pupils have a PISA score that is further away from the mean).

Gender – results are generally broken down to show differences between girls and boys and trends of girls and boys over time.

Immigration background – results are broken down by immigration background. The OECD define second generation immigrants as students where one or both parents were born in another country (i.e. not in the UK). First generation immigrants are where the student was born in another country (i.e. not in the UK). Non-immigrants are where the student and both parents were born in the UK.

Proficiency Levels – PISA scores can be grouped into different PISA Levels. It is common to look at the proportion of students performing below PISA Level 2 and at PISA level 5 or better. The group below Level 2 merits particular attention, as the OECD consider that Level 2 is the baseline of ability to participate effectively in society.

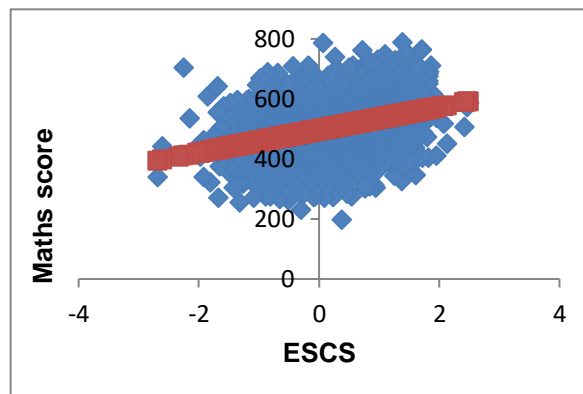
ESCS - The OECD analyse social background using the Index of Economic, Social and Cultural Status (ESCS). It is constructed from the responses given by students

in their background questionnaire and collects information on parental education and occupation, learning resources in the home and cultural possessions. This index is not comparable to the measure commonly used in Scotland - the Scottish Index of Multiple Deprivation (SIMD). There are two main reasons for this:

1. SIMD is exclusive to Scotland, while ESCS is recorded for all participating countries in PISA. This enables comparative analysis between countries.
2. SIMD is an area based measure, with pupils being allocated to datazones based on their postcode. We talk about pupils living in the '20% most deprived areas' when referring to SIMD. ESCS is generated directly from information provided by the student on their own background, rather than it being based on their home address. This means it avoids issues of more affluent students being resident in areas which are disadvantaged, and vice versa.

The ESCS index is used to derive a number of measures, each of which tell us something different about the impact of social background on performance.

The **percentage share of the variation** in performance explained by social background tells us how strong the relationship is between student performance and ESCS. For example, we can see an illustration of Scotland's students' scores in maths for 2012 plotted against the ESCS on the bottom. In 2012, 12.9 per cent of the variation in maths score was explained by social background, and in fact it is possible to see that many students from less affluent backgrounds (towards the left of the graph) achieved high marks - outperforming the average for their circumstances, and vice versa.



The **ESCS gradient**, shows simply how much score varies on average with each step (one point) in social background and can be seen by the slope of the line on the graph. Despite many students "bucking the trend", there is still a positive relationship between affluence and performance in PISA overall. For maths in 2012, this was a gradient of 37 score points. A higher score would indicate a steeper gradient, and greater increases in score with background prosperity.

The **length of the gradient** looks at the students on the 5th and 95th percentiles to ensure that the very extremes of wealth and poverty don't distort the comparison. In Scotland these two notional students were 2.6 points apart by social background measured by ESCS in 2012.

With a gradient of 37 score points, this implies a difference in their maths performance of 96 score points. Although translating this gap into school years of education is not straightforward, the OECD calculate that this could imply as much as three years' difference in learning achievement (with 30 points being equivalent

to a year. Note that this measure depends on the size of the gap in society as well as the gap in education ability.

4. Performance in Reading

4.1 Scotland's performance in Reading

1. Scotland's [mean score](#) in Reading in 2018 was 504. This was higher than it was in 2015 (493), [similar to 2003](#), 2006, 2009 and 2012 and lower than 2000 ([Chart 4.1.1](#)).
2. Scotland's [standard deviation](#) in Reading in 2018 was 95 points. This was similar to 2015 (91 points) and higher than in 2012 (87 points). This means there was more variation in Reading performance in 2018 than there was in 2012.
3. In 2018 in Scotland, performance among girls was higher than among boys in reading (511 vs 497). This was also the case in 2006, 2009, 2012 and 2015 ([Chart 4.1.2](#) and [Chart 4.1.3](#)).
4. In 2018, the performance of second generation [immigrant students](#) (521), first generation immigrant students (509) and non-immigrant students (506) were all similar in Reading.
5. In 2018, 15.5 per cent of students in Scotland performed below [PISA level 2](#) in Reading. This was similar to 2006, 2009, 2012 and 2015. In 2018, 10.3 per cent of students in Scotland performed at PISA level 5 or better in Reading. This was higher than in 2015 (6.4 per cent) and similar to 2006, 2009 and 2012 ([Chart 4.1.4](#)).
6. In 2018, 18.0 per cent of boys performed below PISA Level 2 in Reading, which was higher than the proportion of girls (13.0 per cent). In 2018 the proportion of girls and boys performing at PISA Level 5 or better in Reading was similar (11.4 per cent of girls and 9.2 per cent of boys).
7. The [share of variation](#) in reading test scores that was explained by students' background (ESCS) was 8.3 per cent. This was similar to 2015 and 2012 but lower than the 2009 figure of 14.4 per cent. For more information on ESCS please see section 3.1.
8. The [ESCS gradient](#) shows how much score varies on average with each step (one point) in social background. The ESCS gradient was 32 points in the reading assessment for Scotland in 2018. This was similar to 2012 (34 points) and 2015 (32 points), but lower than in 2006 (42 points) and 2009 (44 points).
9. The difference between the 5th and 95th percentiles by ESCS was 2.72 points. [Combined with a 32-point gradient](#), this implies that their average scores in reading are apart by 86 points which implies a difference of just under three years' schooling.

Chart 4.1.1: Scotland's PISA reading scores, 2000-2018

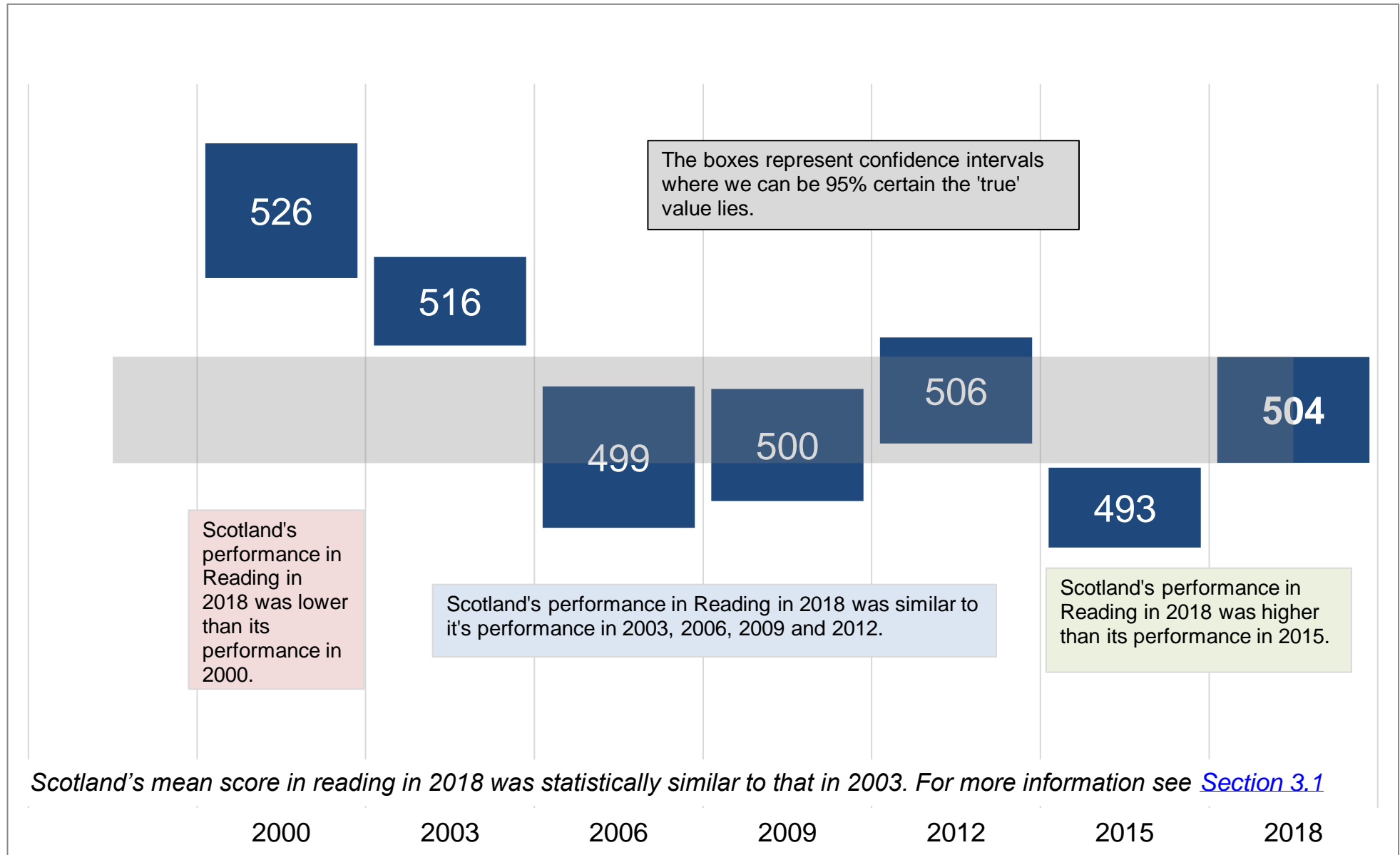


Chart 4.1.2 Scotland's PISA reading scores among **girls**, 2006-2018

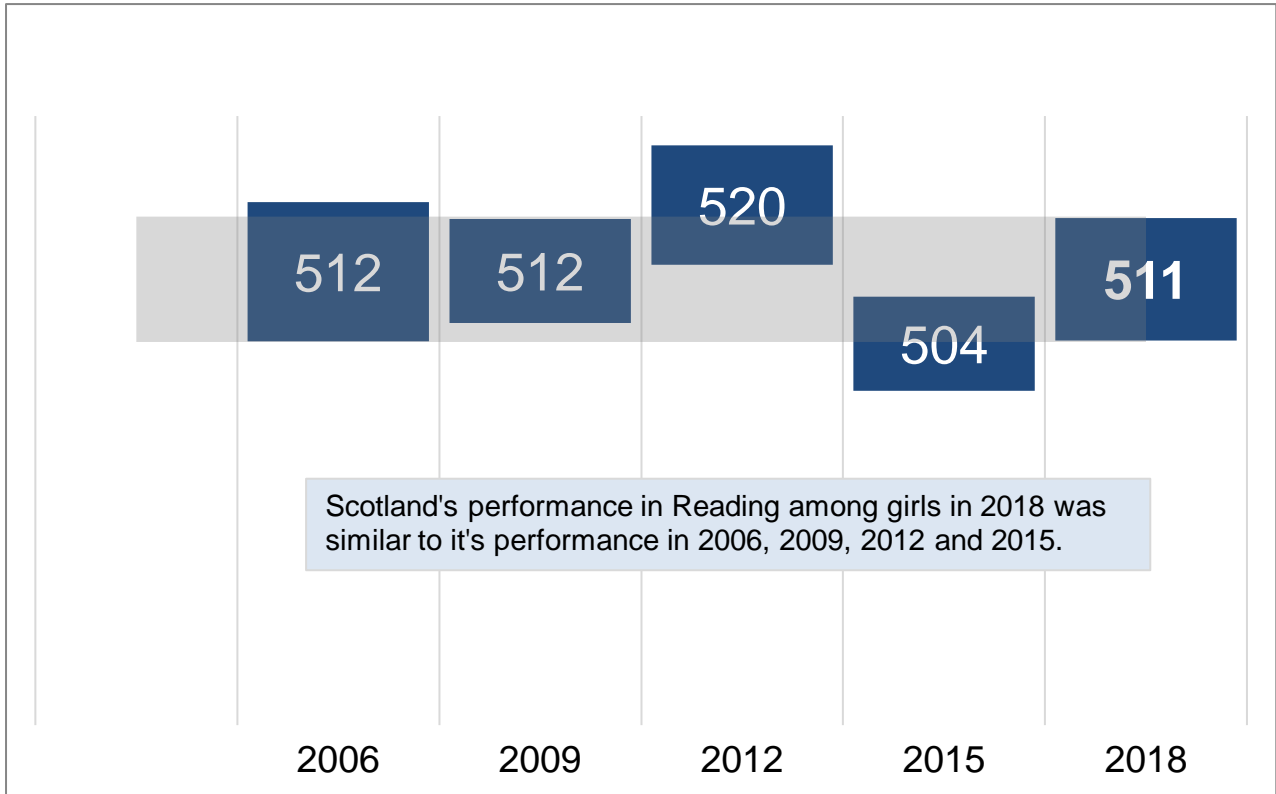


Chart 4.1.3 Scotland's PISA reading scores among **boys**, 2006-2018

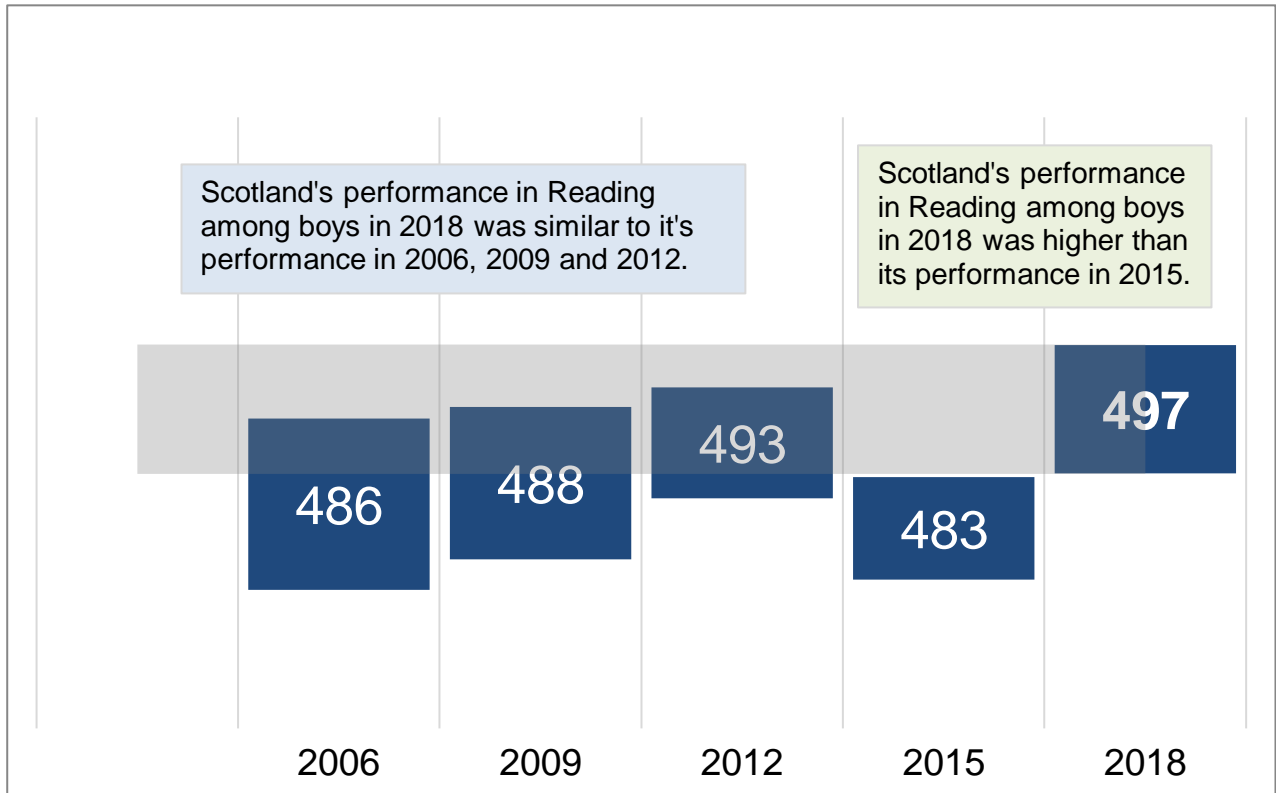
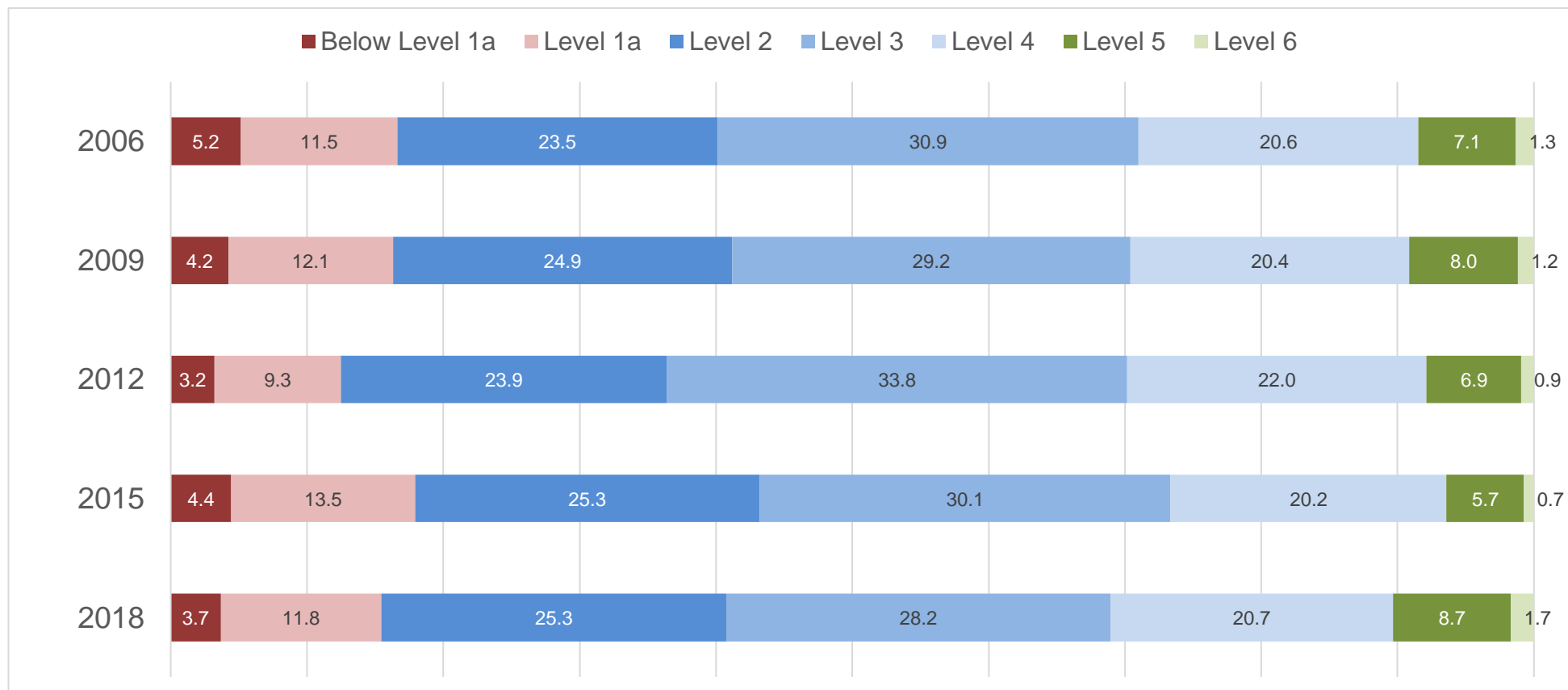


Chart 4.1.4 Scotland's reading scores, by [PISA Proficiency Level](#), 2006-2018



As set out in Chapter 2, the OECD categorise students into Levels according to their ability to undertake certain tasks. However the group below Level 2 merits particular attention, as the OECD consider that Level 2 is the baseline of ability to participate effectively in society.

In 2018, 15.5% of students in Scotland performed below PISA Level 2 in Reading. This was similar to 2006, 2009, 2012 and 2015. In 2018, 10.3% of students in Scotland performed at PISA Level 5 or better in Reading. This was higher than in 2015 (6.4%) and similar to 2006, 2009 and 2012.

4.2 Scotland's performance in Reading relative to countries in the OECD and UK administrations

1. Scotland's [mean score](#) in Reading in 2018 of 504 was higher than 22 countries, including Wales (485) and the OECD average² (487). It was similar to 11 countries, including England (505), Northern Ireland (501) and the UK as a whole (504) and lower than five countries, including Ireland (518). See [Chart 4.2.1](#) for more information. Comparisons to non-OECD countries can be found on our new [PISA dashboard](#).
2. Scotland's mean score in Reading among girls in 2018 was higher than 17 countries and the OECD average, similar to 12 countries and the UK as a whole and lower than nine countries ([Chart 4.2.2](#)).
3. Scotland's mean score in Reading among boys in 2018 was higher than 26 countries and the OECD average, similar to nine countries and the UK as a whole and lower than three ([Chart 4.2.3](#)).
4. Scotland's gender gap in Reading of 15 points (girls – boys) was lower than 26 countries and the OECD average, similar to 12 countries and the UK as a whole and higher than no countries.
5. In 2018, second generation [immigrant students](#) in Scotland (521) performed higher than or similar to all OECD countries in Reading, with only Singapore of the non-OECD countries having a higher performance than Scotland. Performance among first generation immigrant students in Scotland (509) was also higher than or similar to all OECD countries in Reading. The OECD average for second generation immigrant students was 465 and for first generation immigrant students was 440.
6. In 2018, 15.5 per cent of students in Scotland performed below [PISA Level 2](#) in Reading. This was higher than two countries, similar to eight countries and lower than 28 countries ([Chart 4.2.4](#)). 10.3 per cent of students in Scotland performed at PISA Level 5 or better in Reading. This was lower than eight countries, similar to 12 countries and higher than 18 countries ([Chart 4.2.5](#)).
7. The [share of variation](#) in reading test scores that was explained by students' background was 8.3 per cent ([Chart 4.2.6](#)). This was lower than 17 countries, similar to 20 countries and higher than one (Wales).
8. The [ESCS gradient](#) shows how much score varies on average with each step (one point) in social background. The ESCS gradient was 31 points in the reading assessment for Scotland ([Chart 4.2.7](#)). Among OECD countries and UK administrations, this was lower than 15 countries, similar to 21 countries and higher than two countries (Mexico and Wales).

² Note that Spain's results have not been included in international reports or in the OECD average for Reading. Please see [Chapter 1](#) for further information.

Chart 4.2.1 PISA reading [scores](#) of OECD countries (plus three other UK administrations), relative to Scotland, 2018

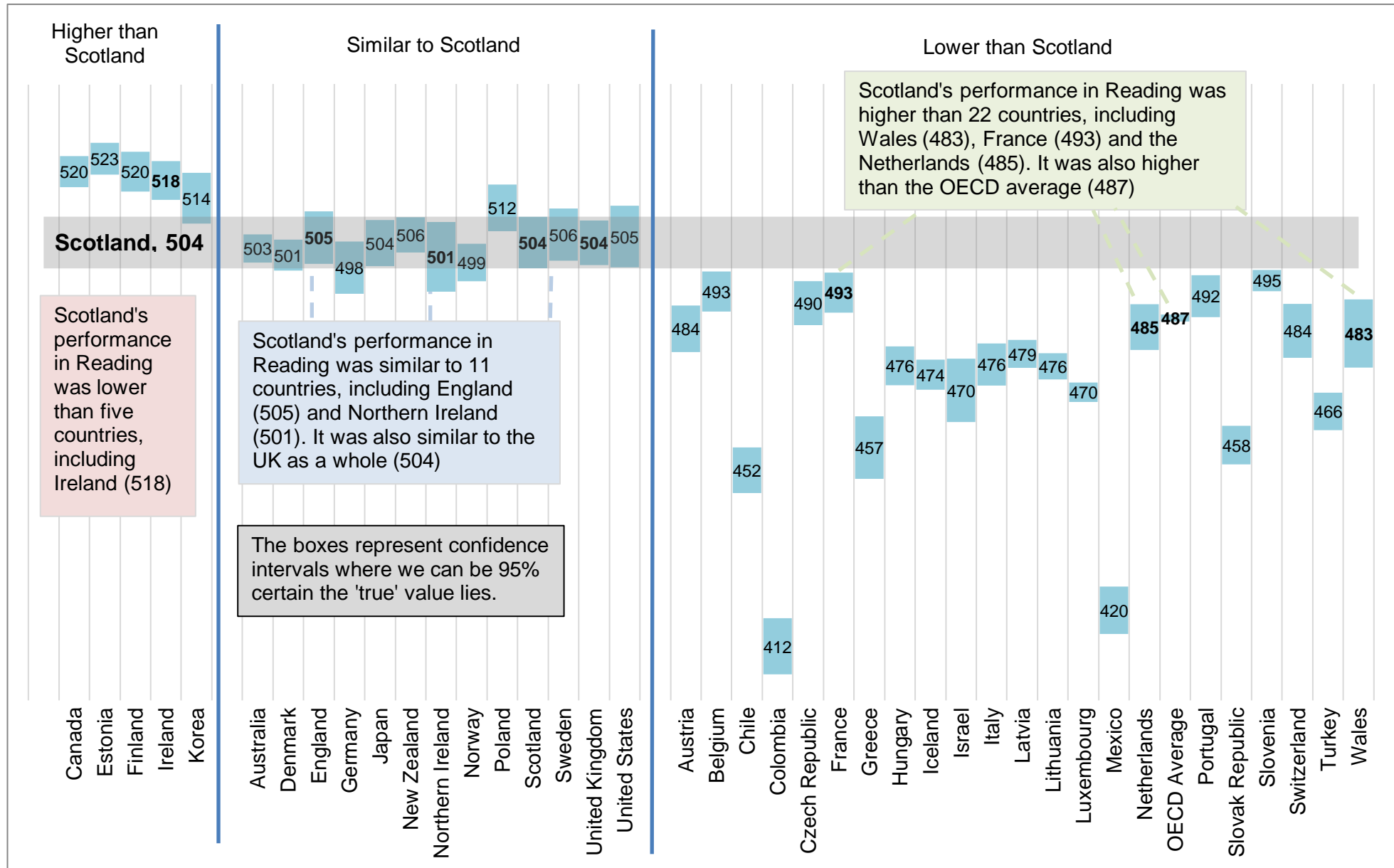


Chart 4.2.2 PISA reading scores among **girls** in OECD countries, relative to Scotland, 2018

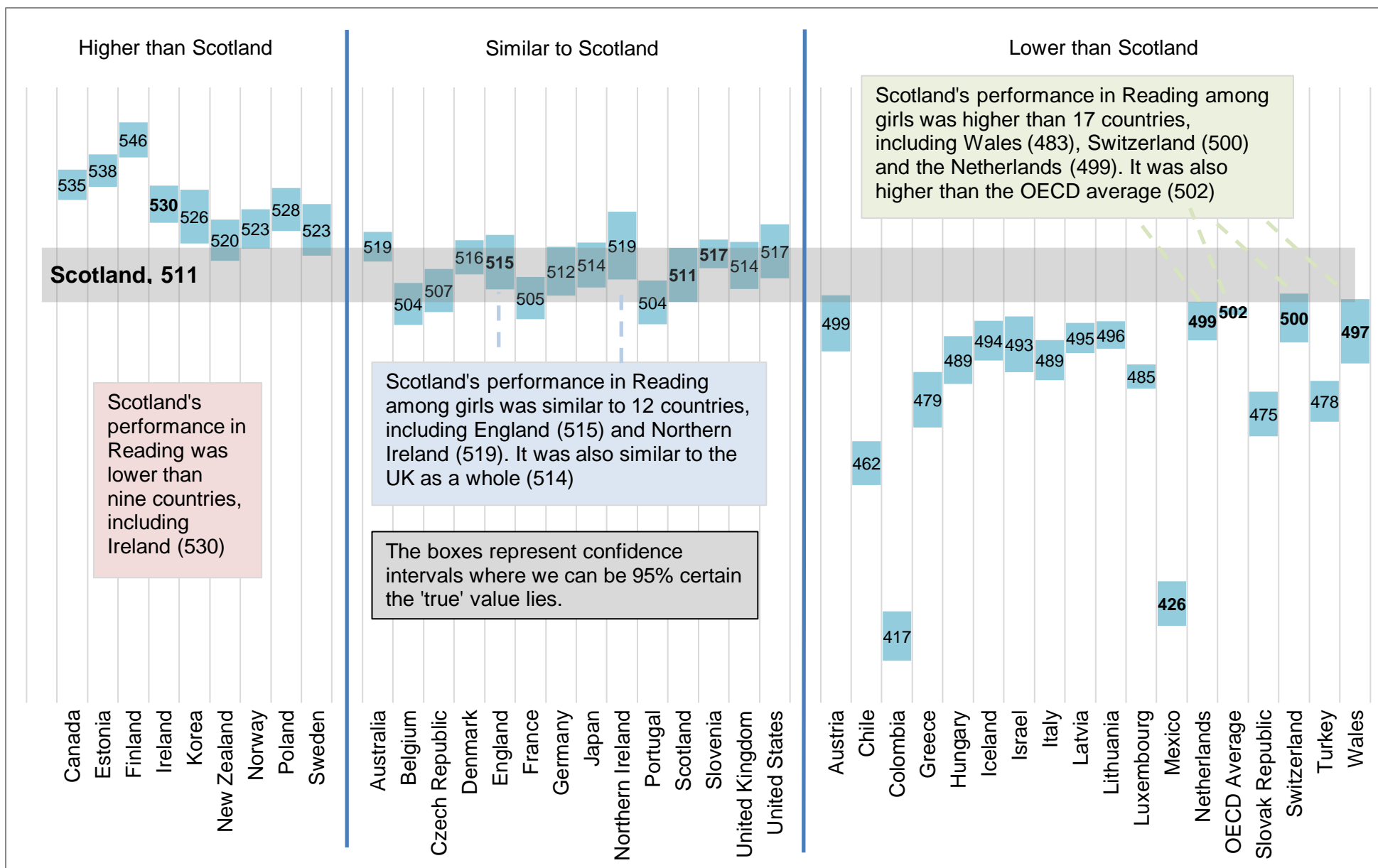


Chart 4.2.3 PISA reading scores among **boys** in OECD countries, relative to Scotland, 2018

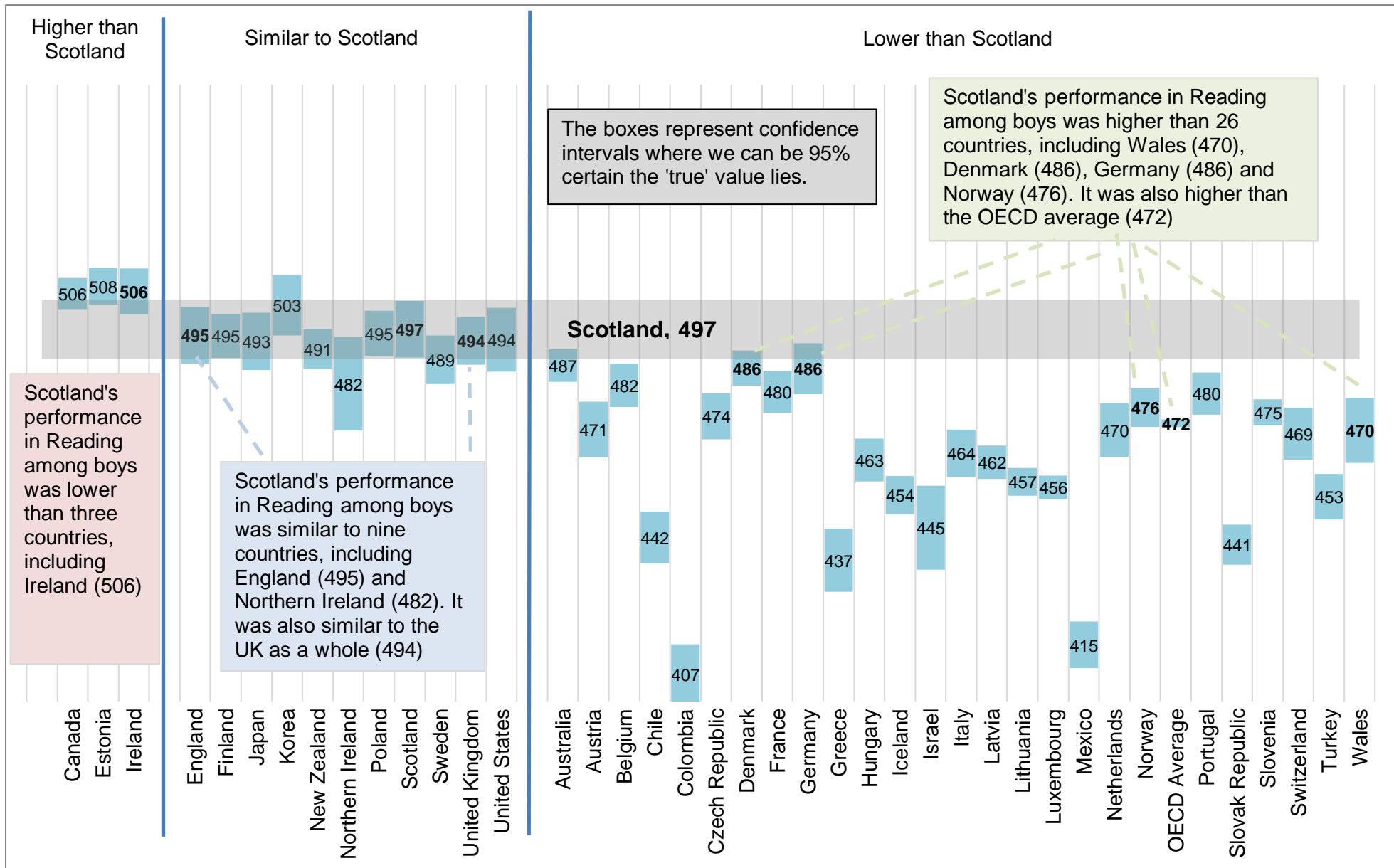
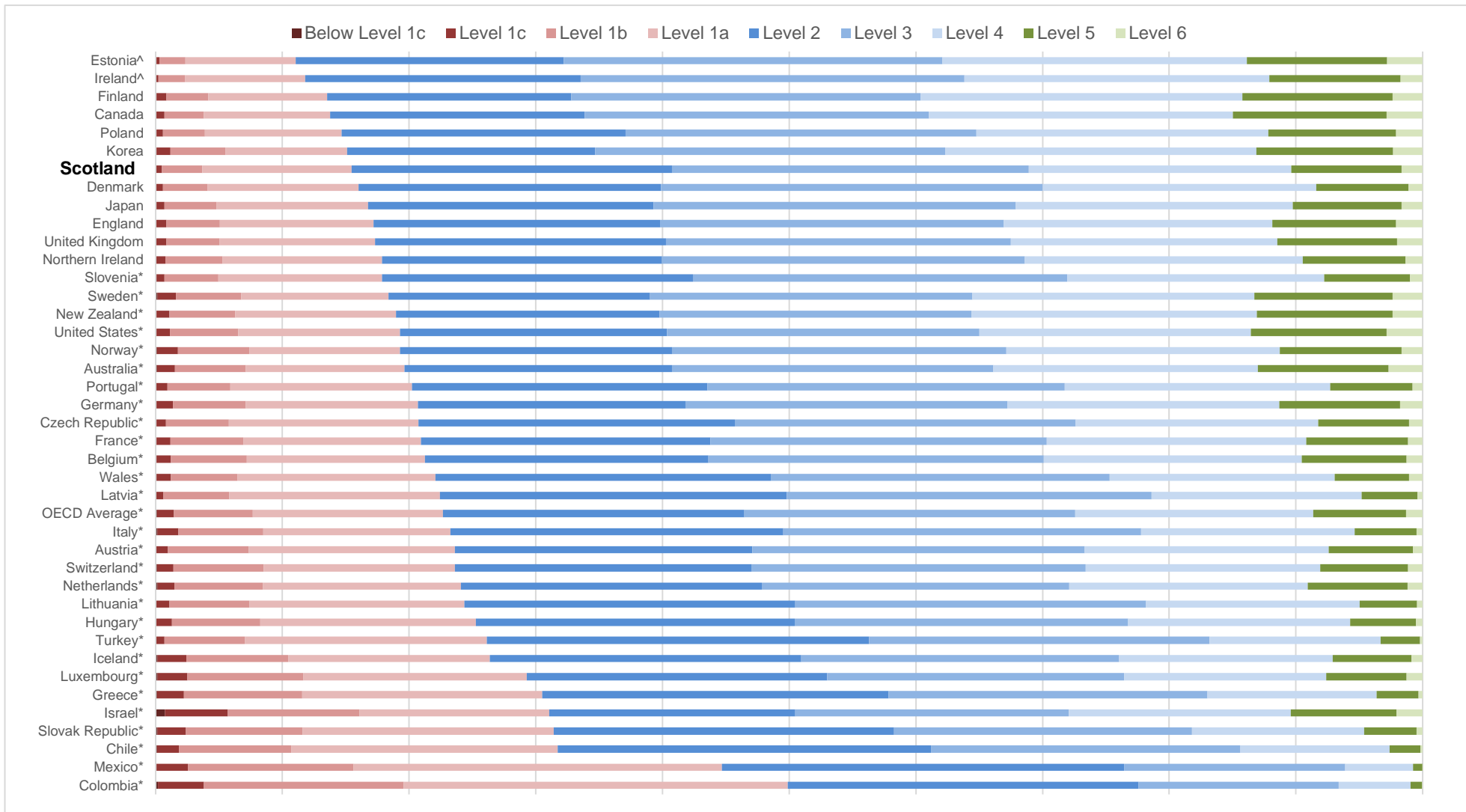
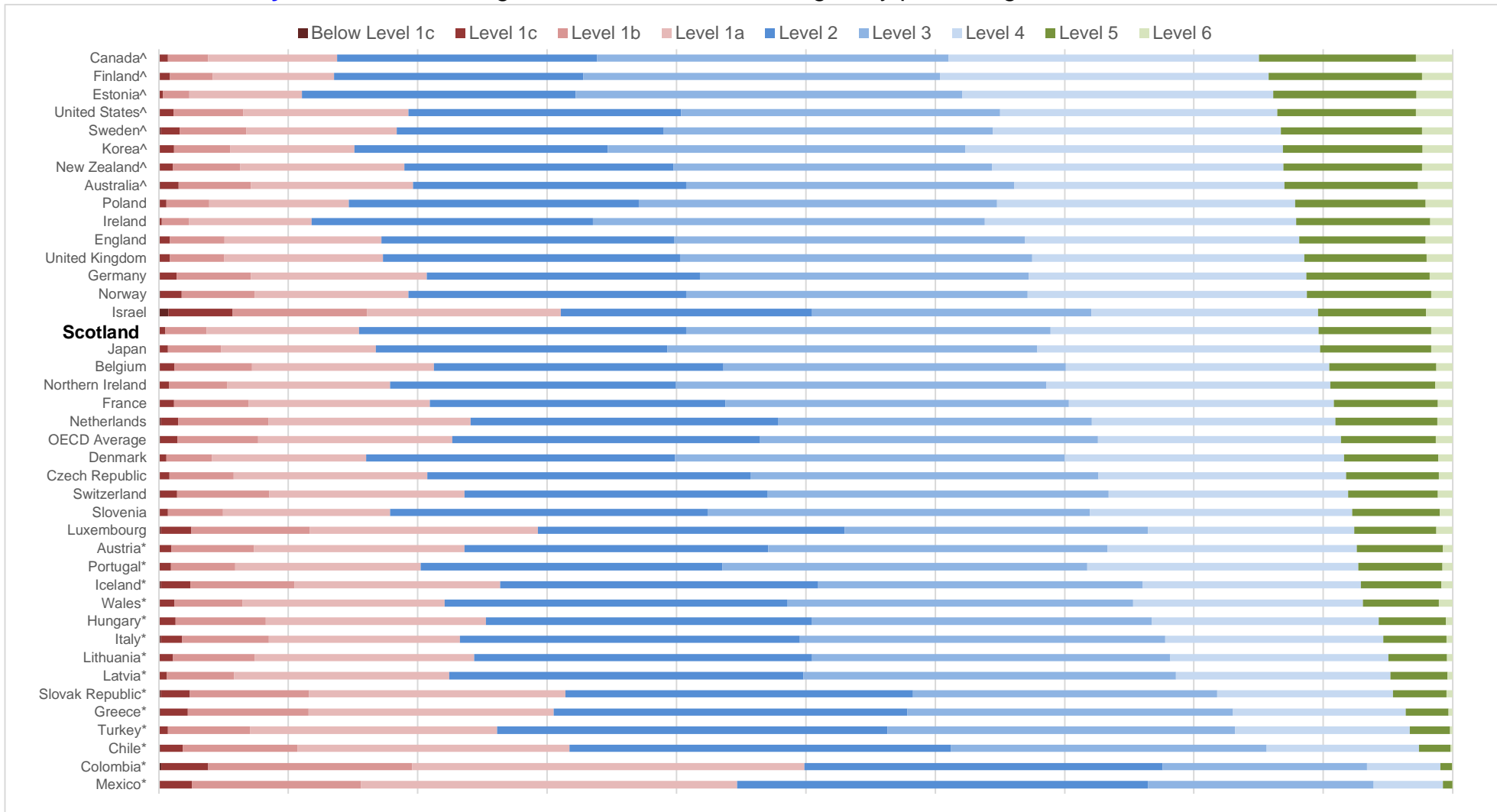


Chart 4.2.4 **Proficiency Levels** in Reading in OECD countries, arranged by percentage of students **below Level 2**, 2018



In 2018, 15.5% of students in Scotland performed below PISA Level 2 in Reading. This was higher ([^]) than two countries, similar to eight countries and the United Kingdom as a whole and lower (^{*}) than 28 countries and the OECD average.

Chart 4.2.5 **Proficiency Levels** in Reading in OECD countries, arranged by percentage of students at **Level 5 or better**, 2018



In 2018, 10.3% of students in Scotland performed at PISA level 5 or better in Reading. This was higher (*) than 18 countries, similar to 12 countries, the UK and the OECD average and lower (^) than eight countries.

Chart 4.2.6 [Share of variation](#) in Reading performance explained by ESCS in OECD countries, relative to Scotland, 2018

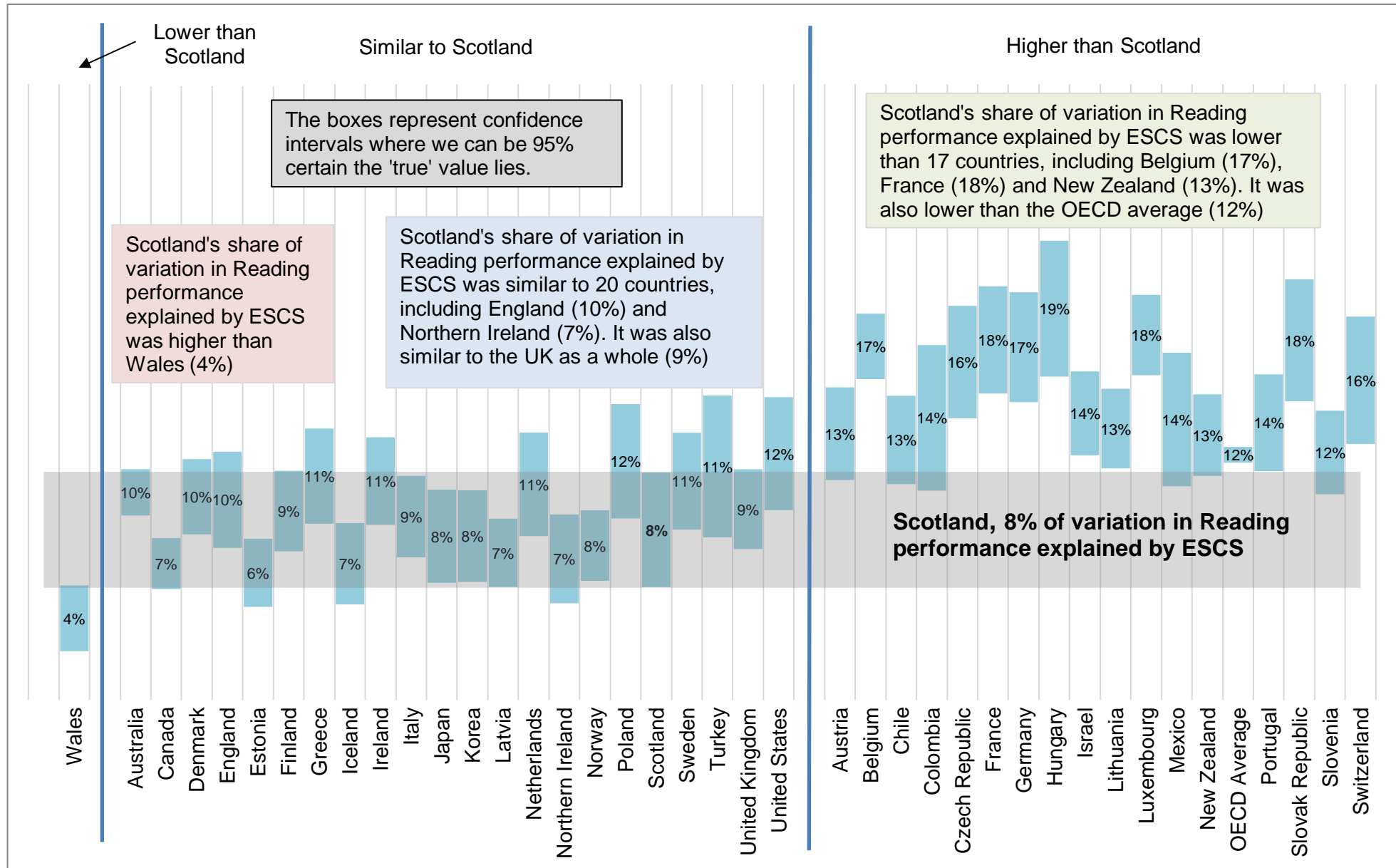
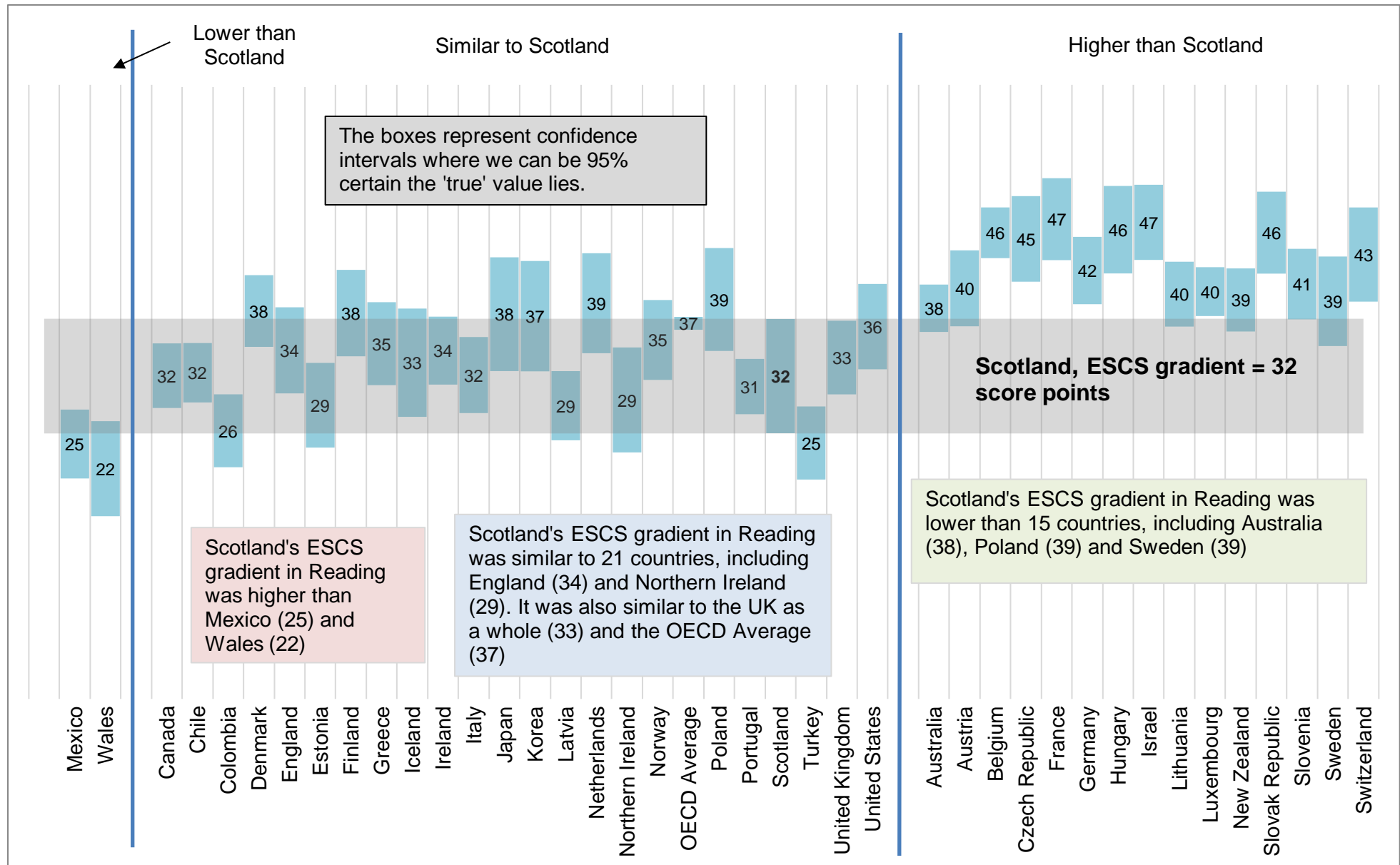


Chart 4.2.7 [ESCS gradient](#) in Reading in OECD countries, relative to Scotland, 2018



5. Performance in Mathematics

5.1 Scotland's performance in Mathematics

1. Scotland's [mean score](#) in Mathematics in 2018 was 489. This was similar to what it was in 2015 (491), 2012 (498) and 2009 (499) but lower than in 2006 (506) and 2003 (524). See [Chart 5.1.1](#) for more information.
2. Scotland's [standard deviation](#) in Mathematics in 2018 was 95 points. This was higher than in 2015 (84 points), 2012 (86 points) and 2006 (85 points) but similar to 2009 (93 points).
3. In 2018 in Scotland, performance among boys was higher than among girls in Mathematics (497 vs 481). This was also the case in 2006, 2009, 2012, but not in 2015 where their performance was similar ([Chart 5.1.2](#) and [Chart 5.1.3](#)).
4. In 2018, the performance of second generation [immigrant students](#) (512), first generation immigrant students (500) and non-immigrant students (490) was similar.
5. In 2018, 23.5 per cent of students in Scotland performed below [PISA Level 2](#) in Mathematics. This was similar to 2009 and 2015, but higher than 2006 and 2012. In 2018, 10.6 per cent of students in Scotland performed at PISA Level 5 or better in Mathematics. This was similar to 2006, 2009, 2012 and 2015 ([Chart 5.1.4](#)).
6. In 2018, 13.0 per cent of boys performed at PISA Level 5 or better in Mathematics, which was higher than the proportion of girls (8.3 per cent). In 2018, the proportion of students performing below PISA Level 2 in Mathematics was similar (25.2 per cent of girls and 21.7 per cent of boys).
7. The [share of variation](#) in Mathematics test scores that was explained by students' background was 7.9 per cent. This was similar to 2015 and 2012 but lower than 2006 (14.6 per cent) and 2009 (16.3 per cent).
8. The [ESCS gradient](#) shows how much score varies on average with each step (one point) in social background. The ESCS gradient was 31 points in the mathematics assessment for Scotland. This was similar to 2006 (41 points), 2012 (37 points) and 2015 (33 points), but lower than in 2009 (45.5 points).
9. The difference between the 5th and 95th percentiles by ESCS was 2.72 points. [Combined with a 31-point gradient](#), this implies that their average scores in mathematics are apart by 83 points which implies a difference of just under three years' schooling.

Chart 5.1.1 Scotland's PISA mathematics [scores](#), 2003-2018

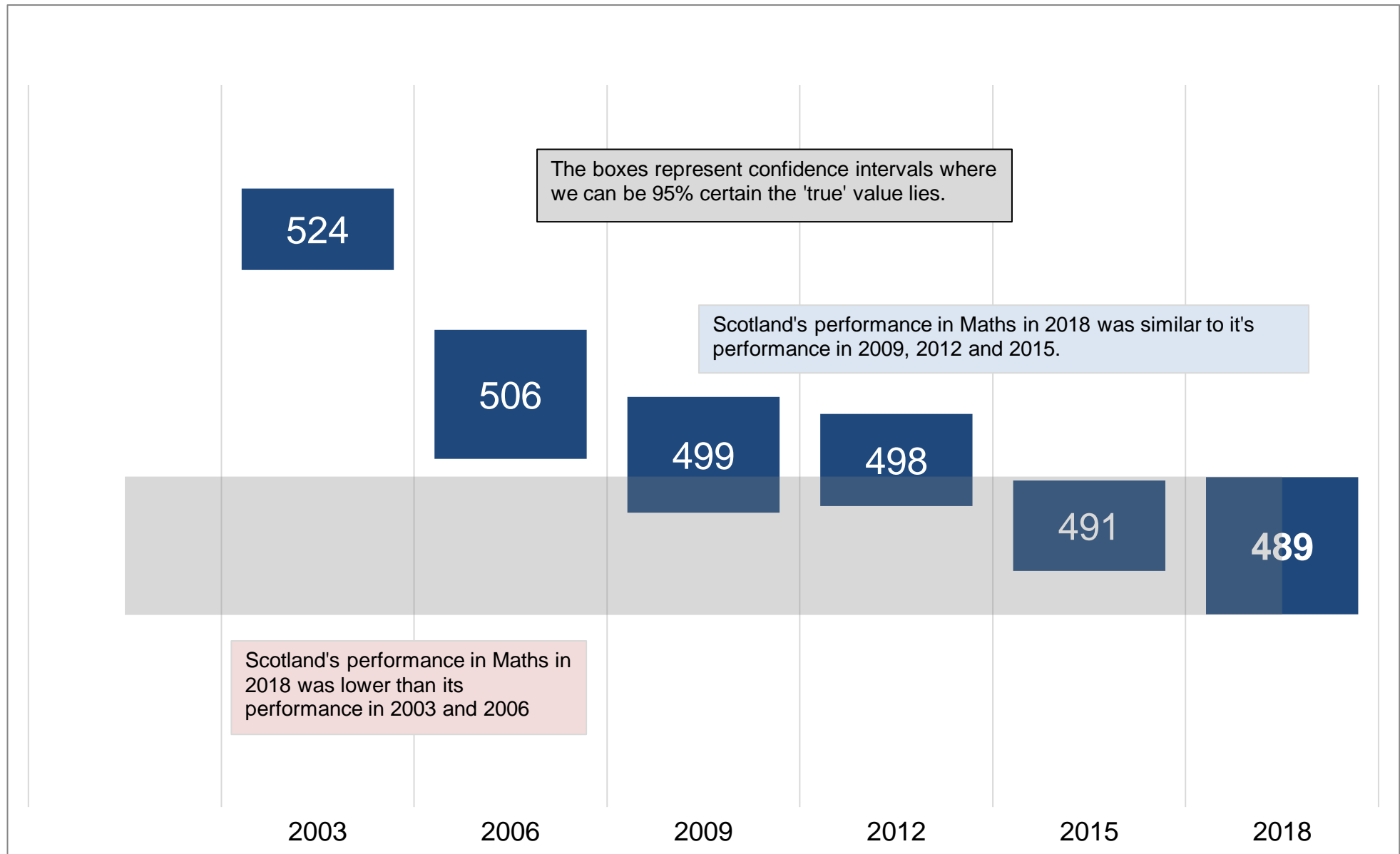


Chart 5.1.2 Scotland's PISA mathematics scores among **girls**, 2006-2018

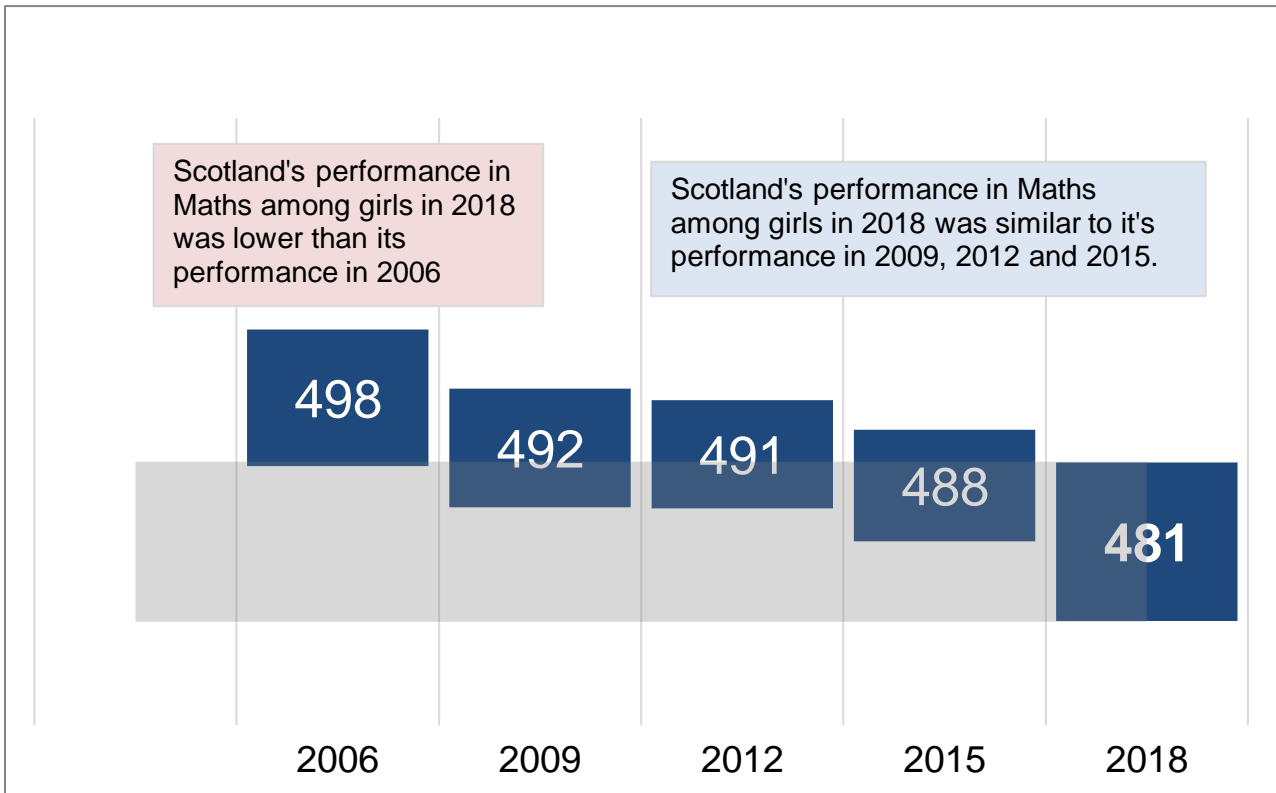


Chart 5.1.3 Scotland's PISA mathematics scores among **boys**, 2006-2018

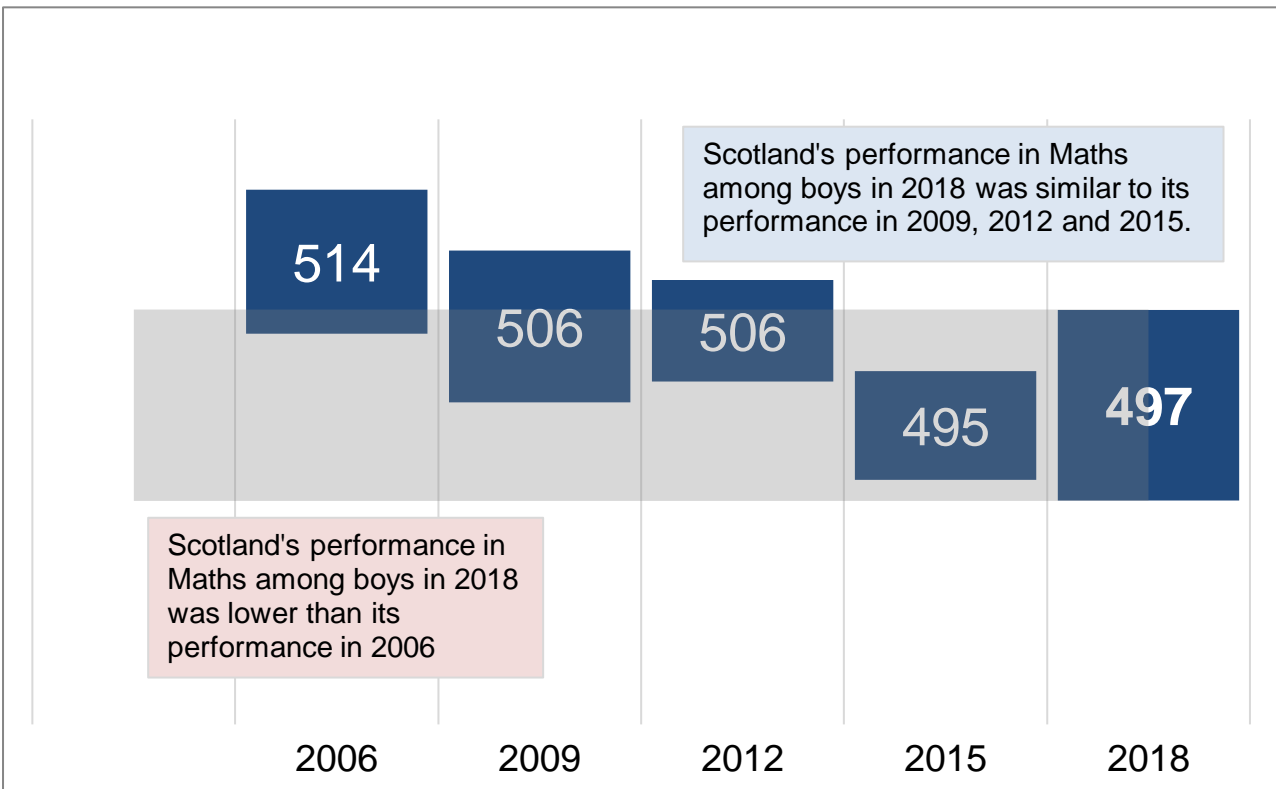
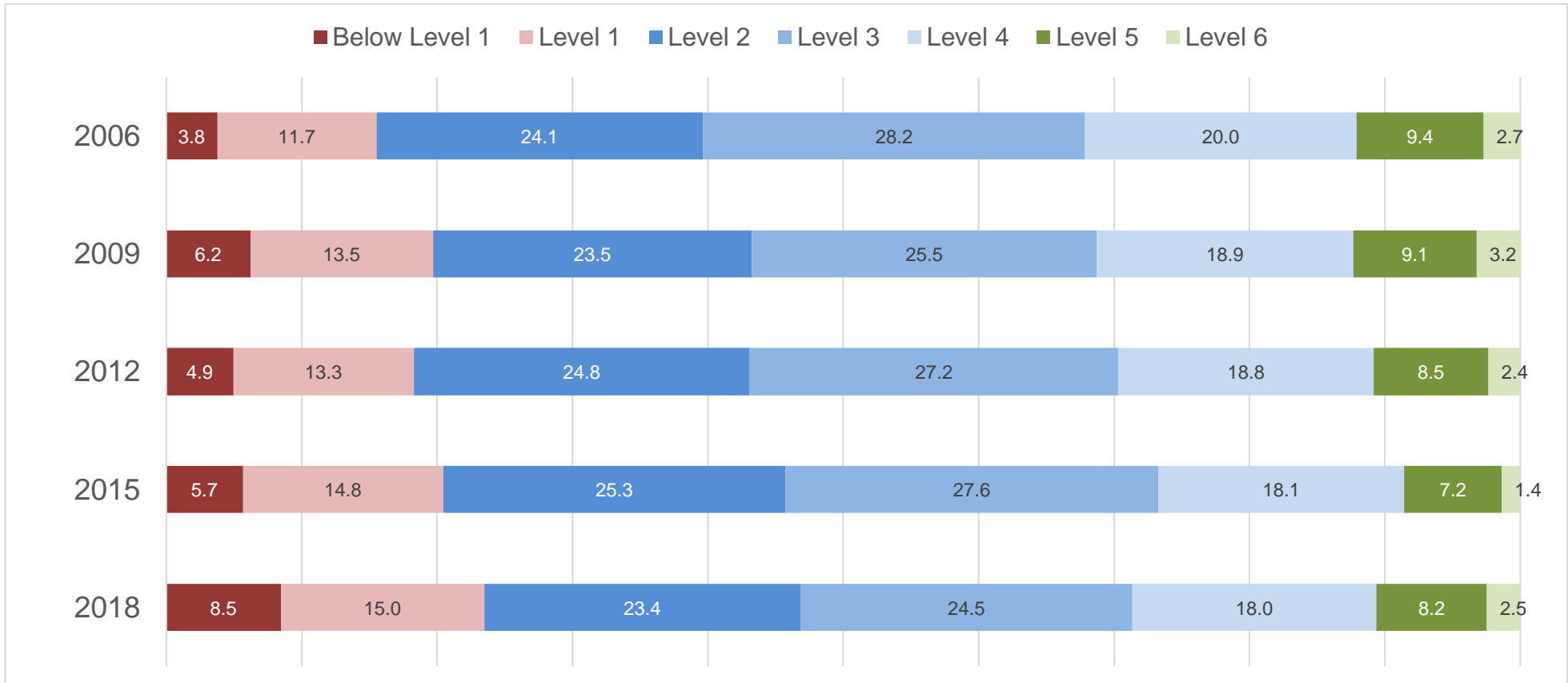


Chart 5.1.4 Scotland's mathematics scores, by [PISA Proficiency Level](#), 2006-2018



As set out in Chapter 2, the OECD categorise students into Levels according to their ability to undertake certain tasks. However the group below Level 2 merits particular attention, as the OECD consider that Level 2 is the baseline of ability to participate effectively in society.

In 2018, 23.5% of students in Scotland performed below PISA Level 2 in Mathematics. This was similar to 2009 and 2015, but higher than 2006 and 2012. In 2018, 10.6% of students in Scotland performed at PISA Level 5 or better in Mathematics. This was similar to 2006, 2009, 2012 and 2015.

5.2 Scotland's performance in Mathematics relative to countries in the OECD and UK administrations

1. Scotland's [mean score](#) in Mathematics in 2018 of 489 was higher than seven countries, including the United States (478). It was similar to 14 countries, including Northern Ireland (492), Wales (487) and the OECD average (489). It was lower than 18 countries, including England (504) and the UK as a whole (502). See [Chart 5.2.1](#) for more information. Comparisons to non-OECD countries can be found on our new [PISA dashboard](#).
2. Scotland's mean score in Mathematics among girls in 2018 was higher than six countries, similar to 12 countries and the OECD average and lower than 21 countries and the UK as a whole ([Chart 5.2.2](#)).
3. Scotland's mean score in Mathematics among boys in 2018 was higher than nine countries, similar to 19 countries, the OECD average and the UK as a whole and lower than 11 countries ([Chart 5.2.3](#)).
4. Scotland's gender gap in Mathematics of -16 points (girls – boys) was lower than nine countries, similar to 30 countries, the OECD average and the UK as a whole and higher than no countries.
5. In 2018, second generation [immigrant students](#) in Scotland (512) performed higher than or similar to all OECD countries in Mathematics, with only Singapore and Macao (China) of the non-OECD countries having a higher performance than Scotland. Performance among first generation immigrant students in Scotland (500) was also higher than or similar to all OECD countries in Mathematics.
6. In 2018, 23.5 per cent of students in Scotland performed below [PISA Level 2](#) in Mathematics. This was higher than 16 countries and also higher than the UK as a whole. It was similar to 16 countries and the OECD average and lower than seven countries ([Chart 5.2.4](#)).
7. 10.6 per cent of students in Scotland performed at PISA Level 5 or better in Mathematics. This was lower than 10 countries, similar to 21 countries (plus the UK and the OECD average) and higher than eight countries ([Chart 5.2.5](#)).
8. The [share of variation](#) in mathematics test scores that was explained by students' background was 7.9 per cent ([Chart 5.2.6](#)). Among OECD countries and UK administrations, this was lower than 18 countries, including the OECD average (13.8 per cent), similar to 21 countries and higher than no countries.
9. The [ESCS gradient](#) shows how much score varies on average with each step (one point) in social background ([Chart 5.2.7](#)). The ESCS gradient was 31 points in the mathematics assessment for Scotland. Among OECD countries and UK administrations, this was lower than eight countries, similar to 31 countries and higher than no countries.

Chart 5.2.1 PISA mathematics scores of OECD countries (plus three other UK administrations), relative to Scotland, 2018

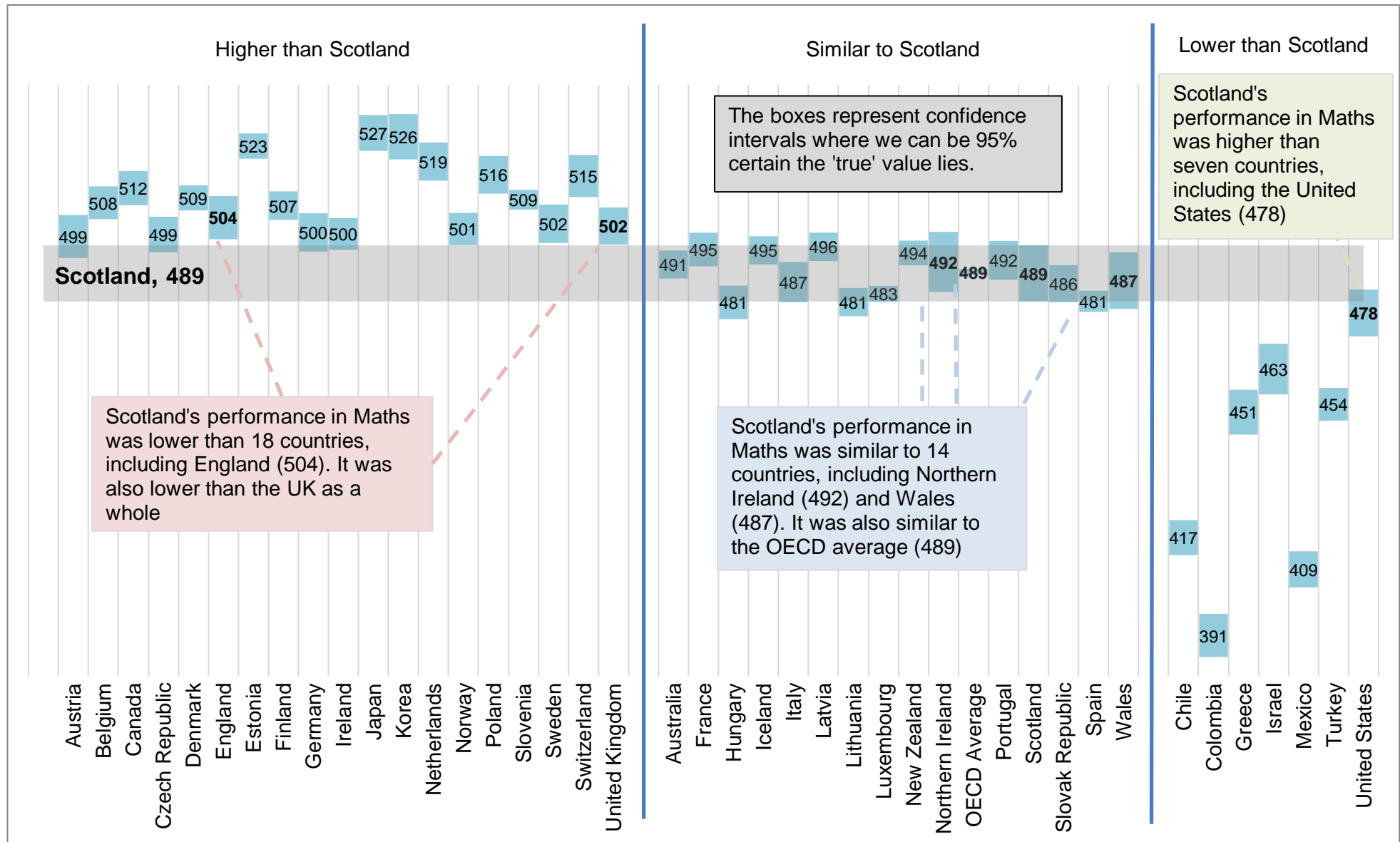


Chart 5.2.2 PISA mathematics scores among **girls** in OECD countries, relative to Scotland, 2018

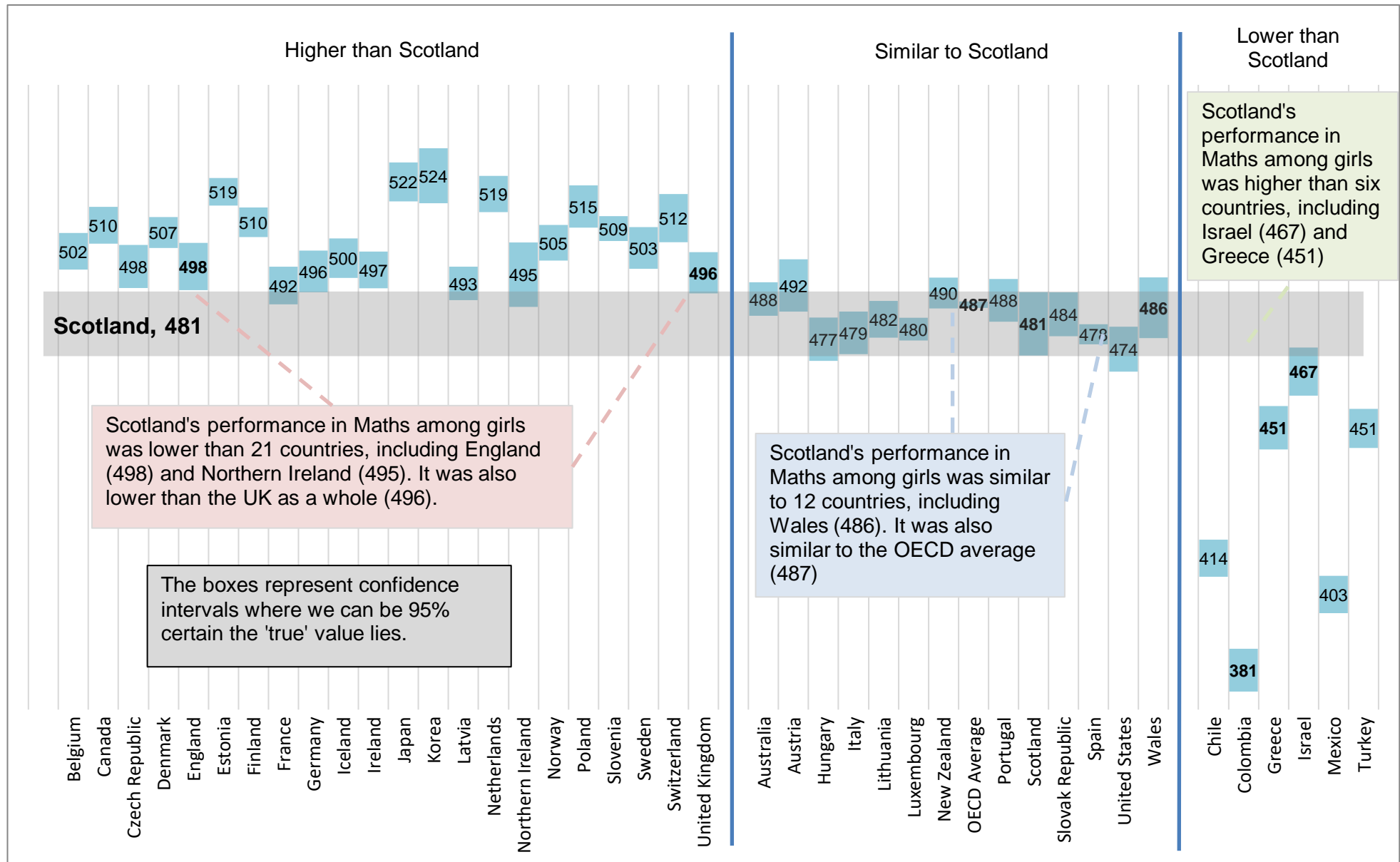


Chart 5.2.3 PISA mathematics scores among **boys** in OECD countries, relative to Scotland, 2018

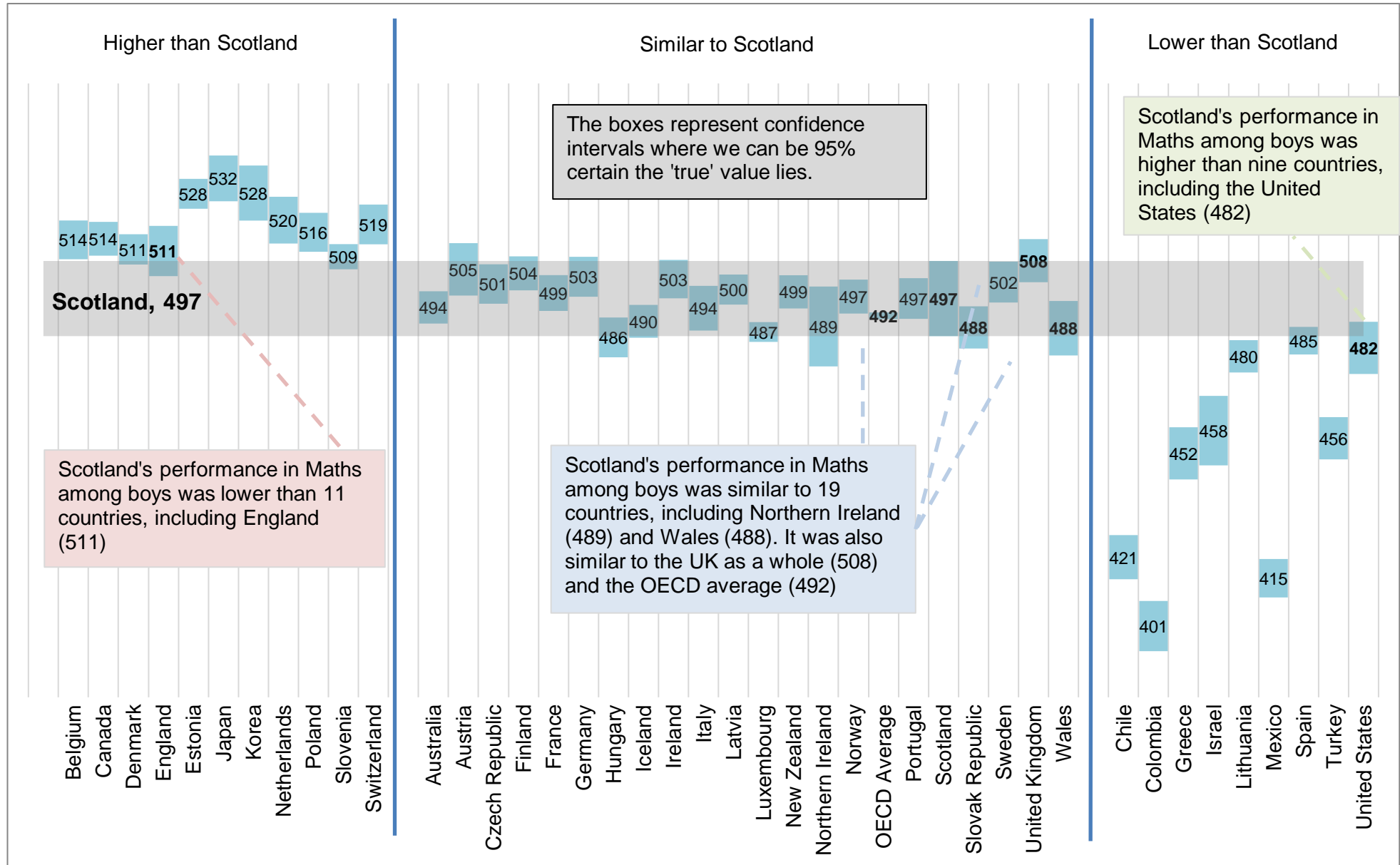
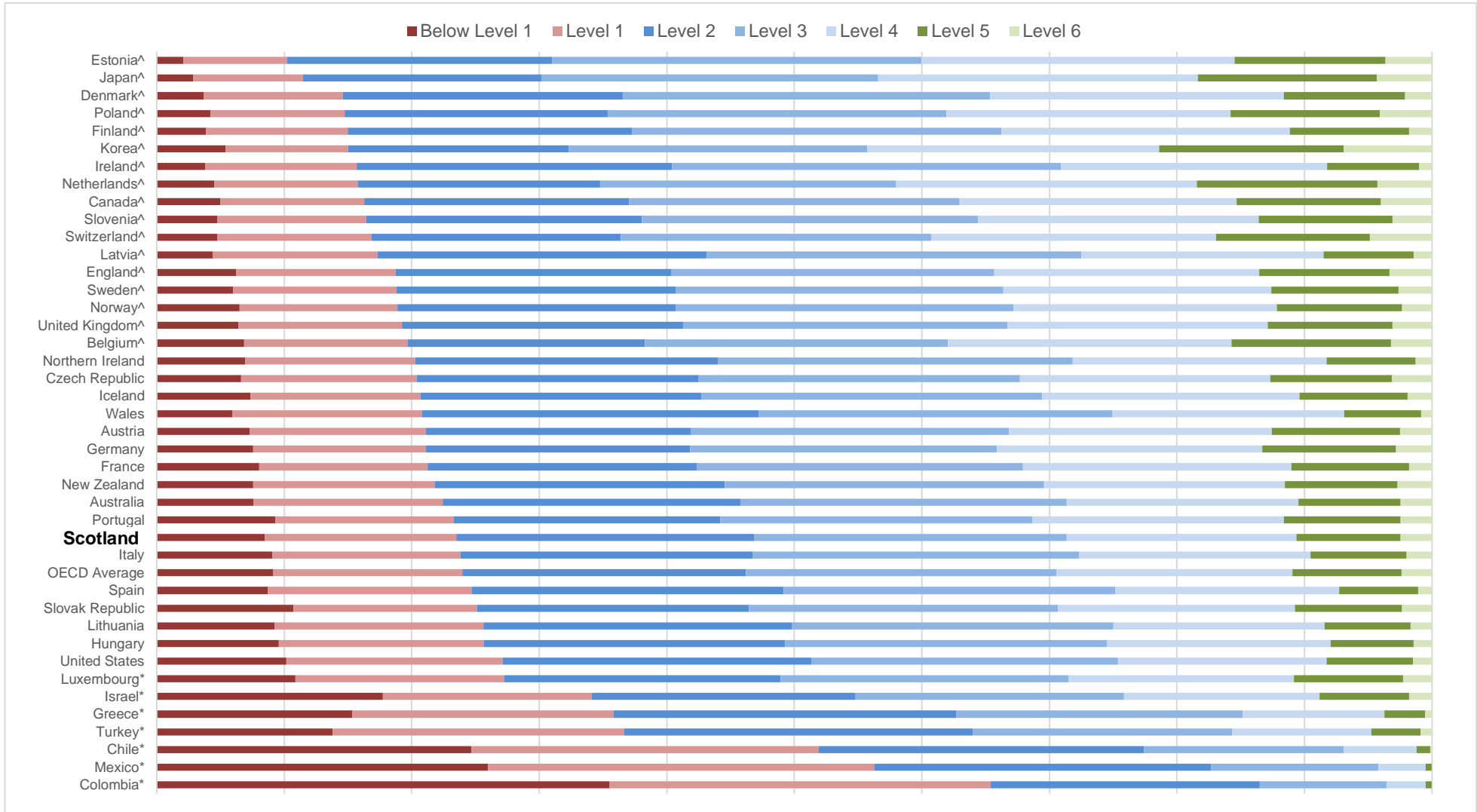
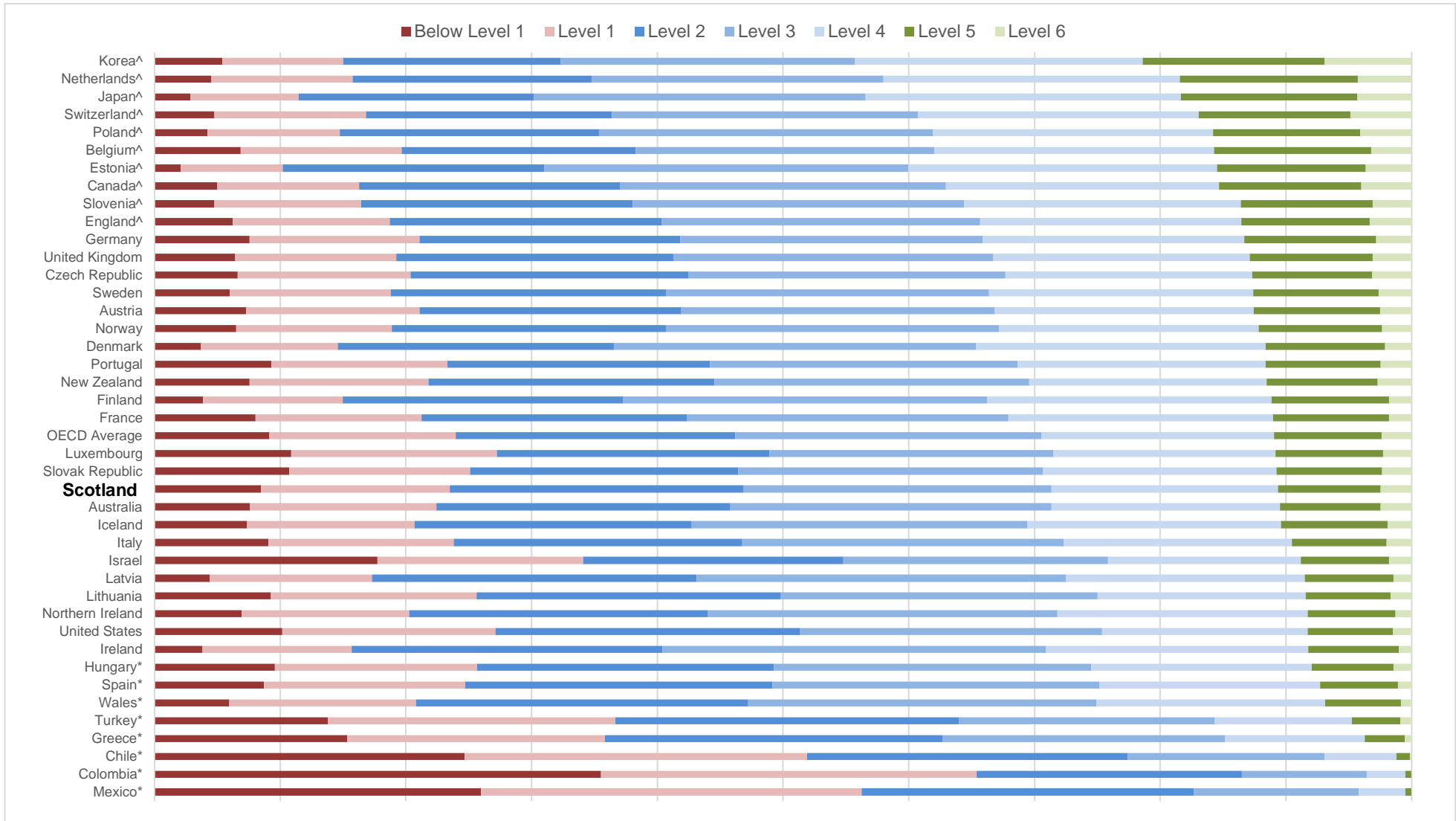


Chart 5.2.4 **Proficiency Levels** in Mathematics in OECD countries, arranged by percentage of students **below Level 2**, 2018



In 2018, 23.5% of students in Scotland performed below PISA level 2 in Mathematics. This was higher ([^]) than 16 countries and the United Kingdom as a whole, similar to 16 countries and the OECD average and lower (^{*}) than seven countries.

Chart 5.2.5 **Proficiency Levels** in Mathematics in OECD countries, by percentage of students at **Level 5 or better**, 2018



In 2018, 10.6% of students in Scotland performed at PISA Level 5 or better in Mathematics. This was higher (*) than eight countries, similar to 21 countries, the UK and the OECD average and lower (^) than 10 countries.

Chart 5.2.6 [Share of variation](#) in Mathematics performance explained by ESCS in OECD countries, relative to Scotland, 2018

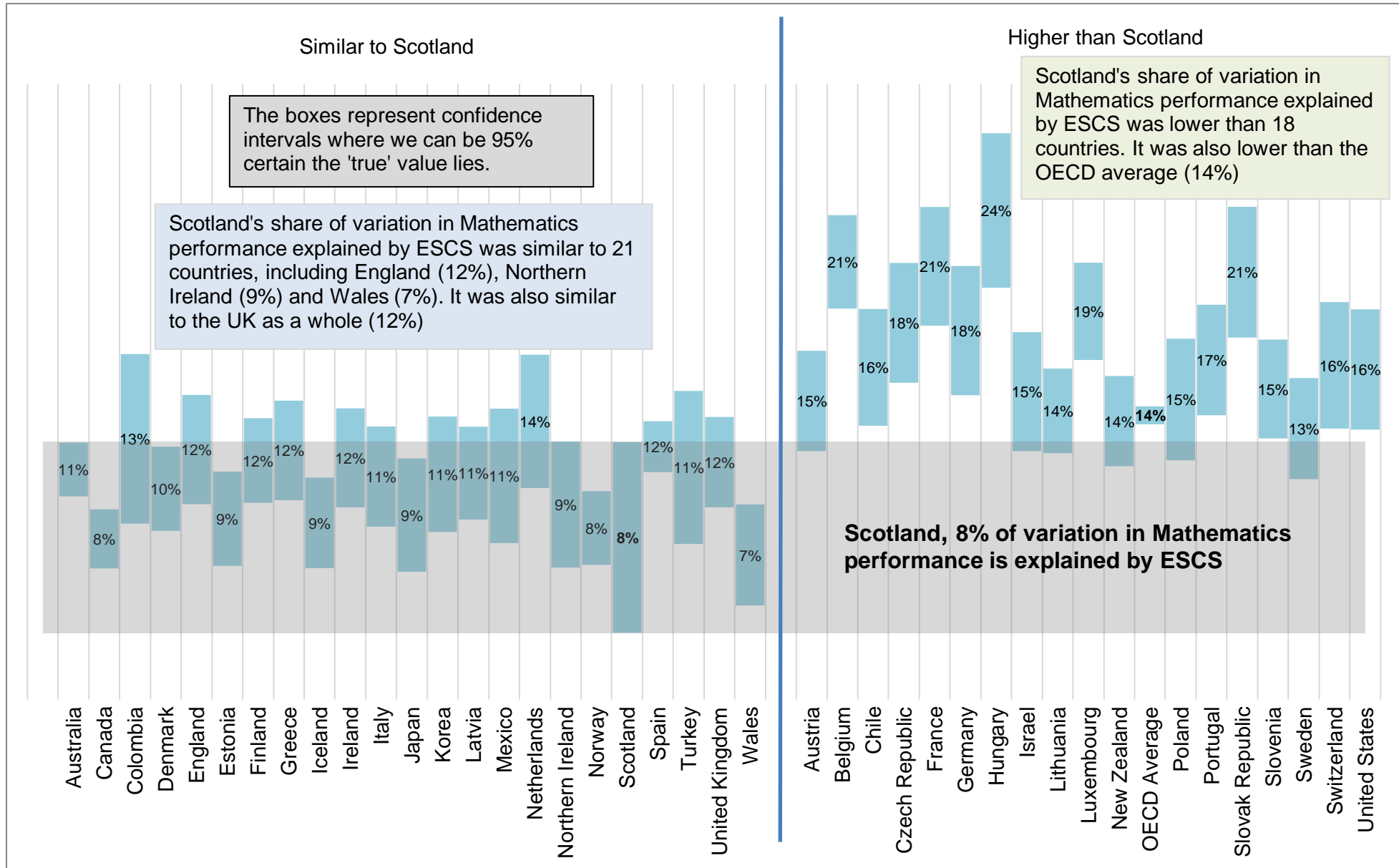
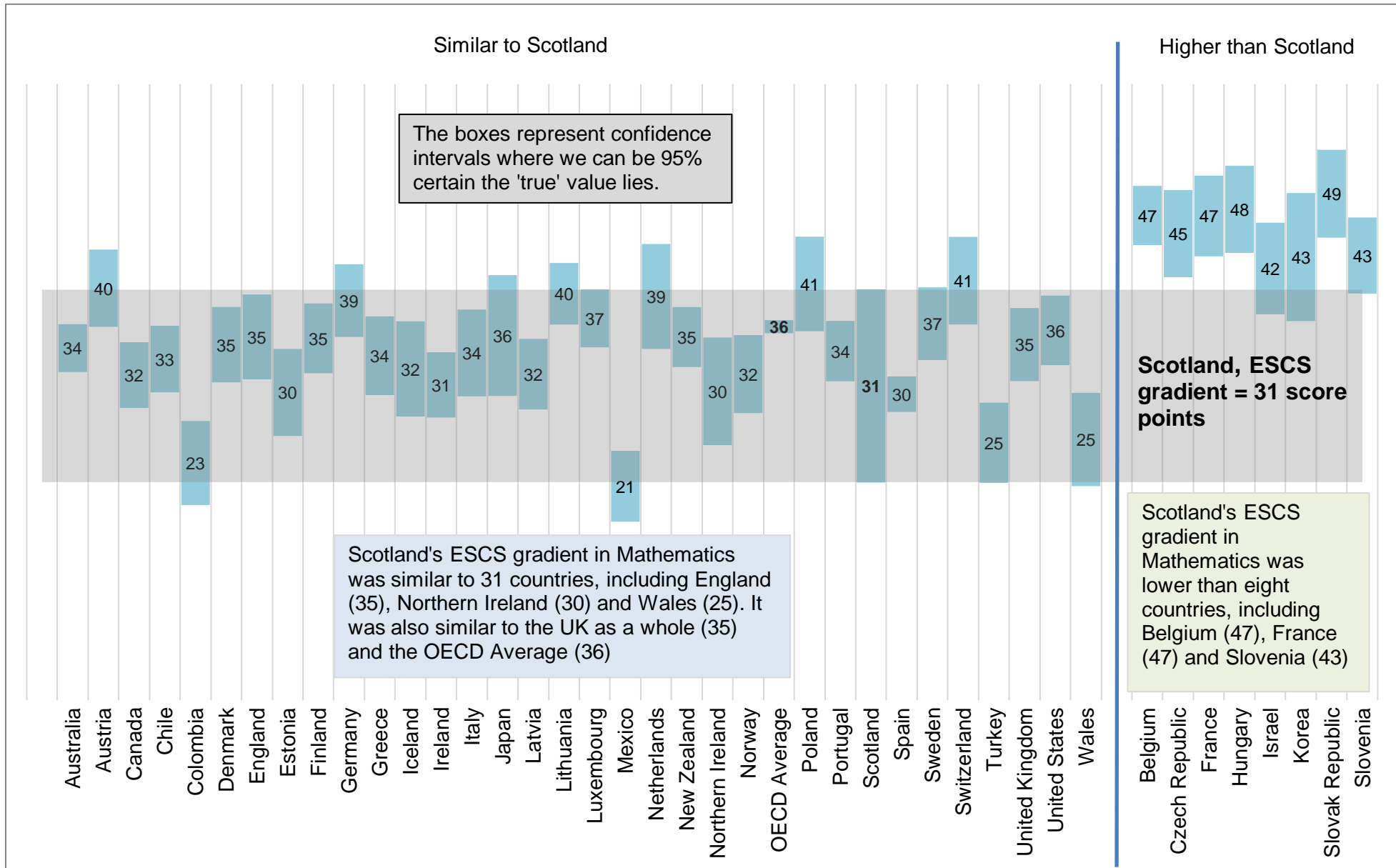


Chart 5.2.7 [ESCS gradient](#) in Mathematics in OECD countries, relative to Scotland, 2018



6. Performance in Science

6.1 Scotland's performance in Science

1. Scotland's [mean score](#) in Science in 2018 was 490. This was similar to what it was in 2015 (497), but lower than in 2012 (513), 2009 (514) and 2006 (515). See [Chart 6.1.1](#) for more information.
2. Scotland's [standard deviation](#) in Science in 2018 was 98 points. This was similar to 2015 (95 points), 2009 (96 points) and 2006 (100 points) but higher than 2012 (89 points).
3. In 2018 in Scotland, girls and boys had a similar performance in Science (486 vs 494). This was also the case in 2006, 2009, 2012 and 2015 ([Chart 6.1.2](#) and [Chart 6.1.3](#)).
4. In 2018, the performance of first generation [immigrant students](#) (509), second generation immigrant students (502) and non-immigrant students (491) was similar.
5. In 2018, 21.1 per cent of students in Scotland performed below [PISA Level 2](#) in Science. This was similar to 2015, but higher than 2006, 2009 and 2012. In 2018, 7.2 per cent of students in Scotland performed at PISA Level 5 or better in Science. This was similar to 2012 and 2015 but lower than 2006 and 2009 ([Chart 6.1.4](#)).
6. In 2018 the proportion of girls and boys performing below PISA Level 2 in Science was similar (21.4 per cent of girls and 20.7 per cent of boys). The proportion performing at PISA Level 5 or better was also similar (6.0 per cent of girls and 8.5 per cent of boys).
7. The [share of variation](#) in Science test scores that was explained by students' background was 10.1 per cent. This was similar to 2015, 2012 and 2006 but lower than 2009 (16.4 per cent).
8. The [ESCS gradient](#) shows how much score varies on average with each step (one point) in social background. The ESCS gradient was 36 points in the science assessment for Scotland. This was similar to 2012 (36 points) and 2015 (37 points), but lower than in 2009 (47 points) and 2006 (50 points).
9. The difference between the 5th and 95th percentiles by ESCS was 2.72 points. [Combined with a 36-point gradient](#), this implies that their average scores in mathematics are apart by 98 points which implies a difference of just over three years' schooling.

Chart 6.1.1 Scotland's PISA science [scores](#), 2006-2018

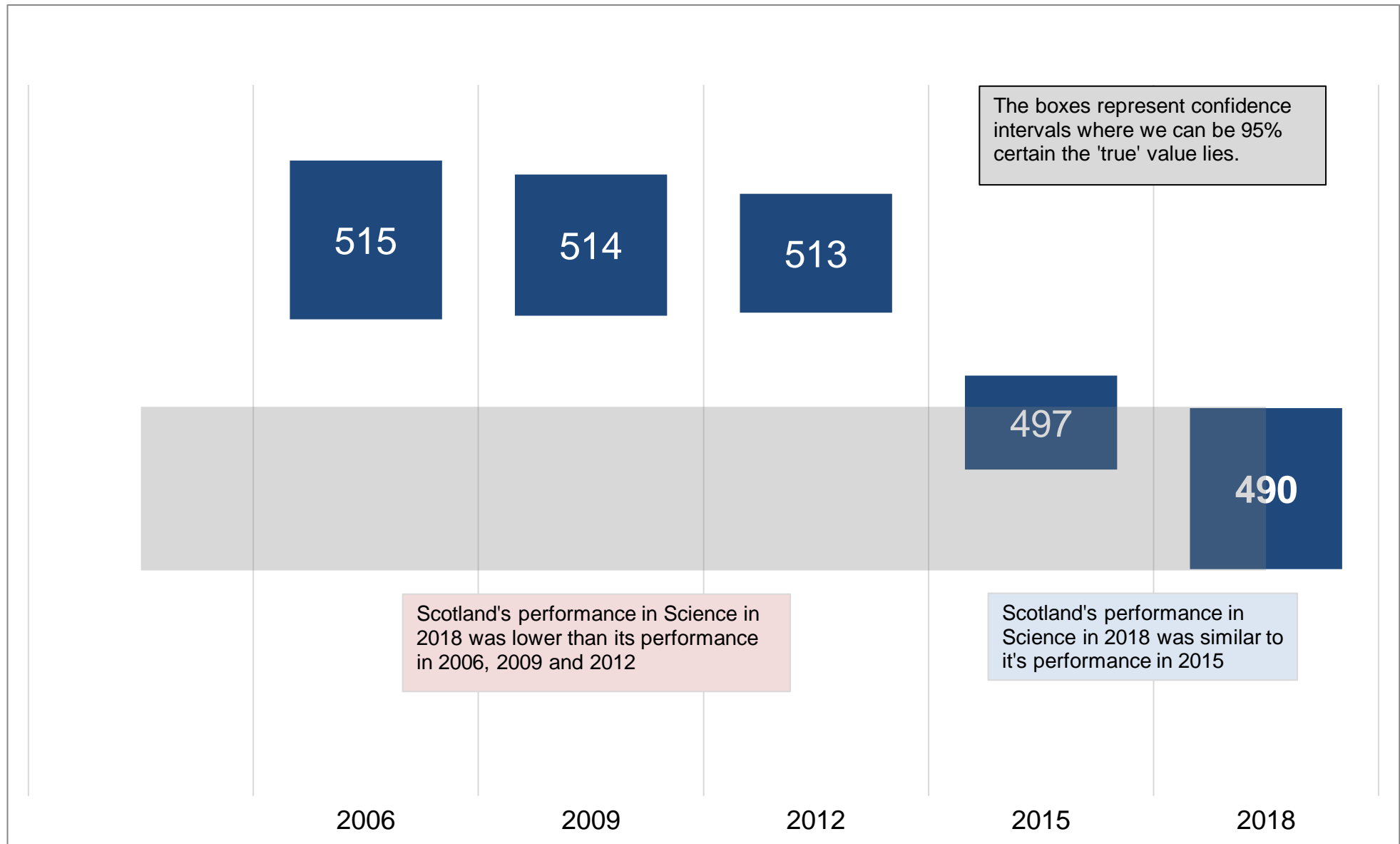


Chart 6.1.2 Scotland's PISA science scores among **girls**, 2006-2018

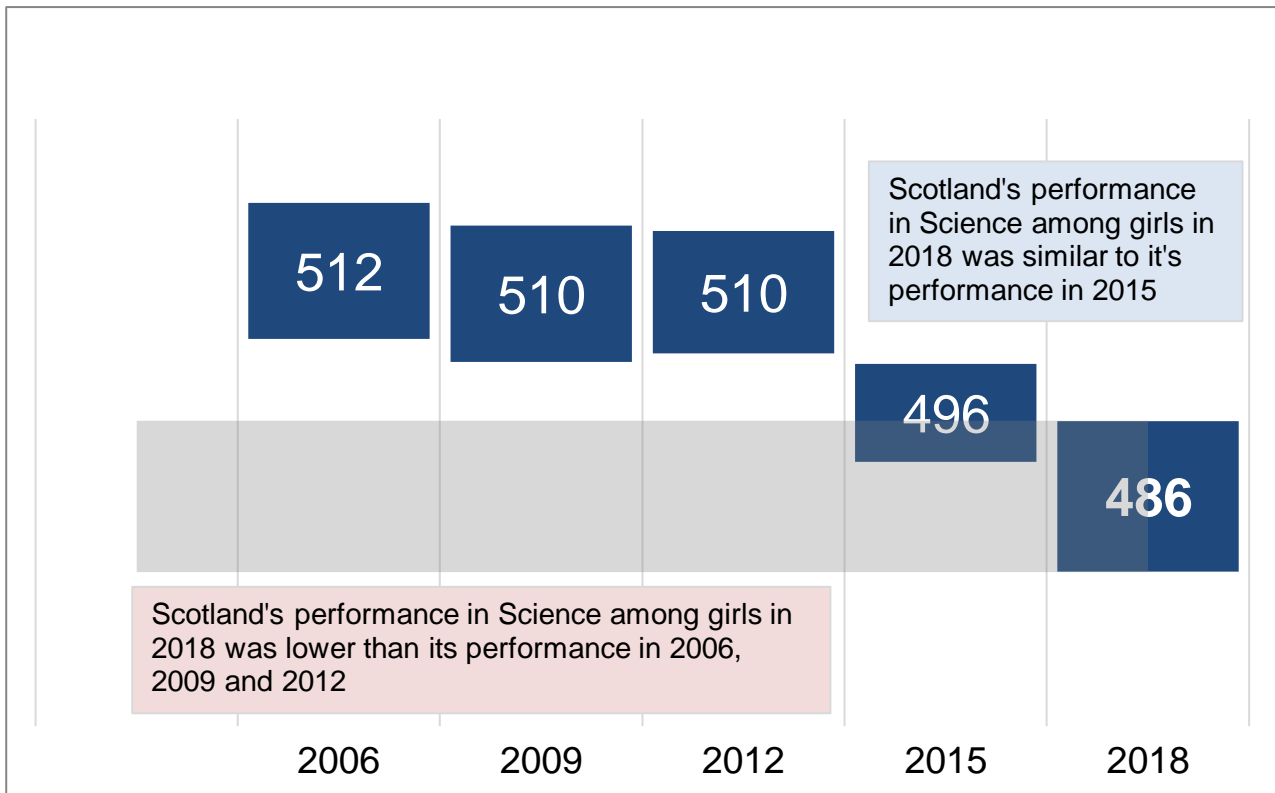


Chart 6.1.3 Scotland's PISA science scores among **boys**, 2006-2018

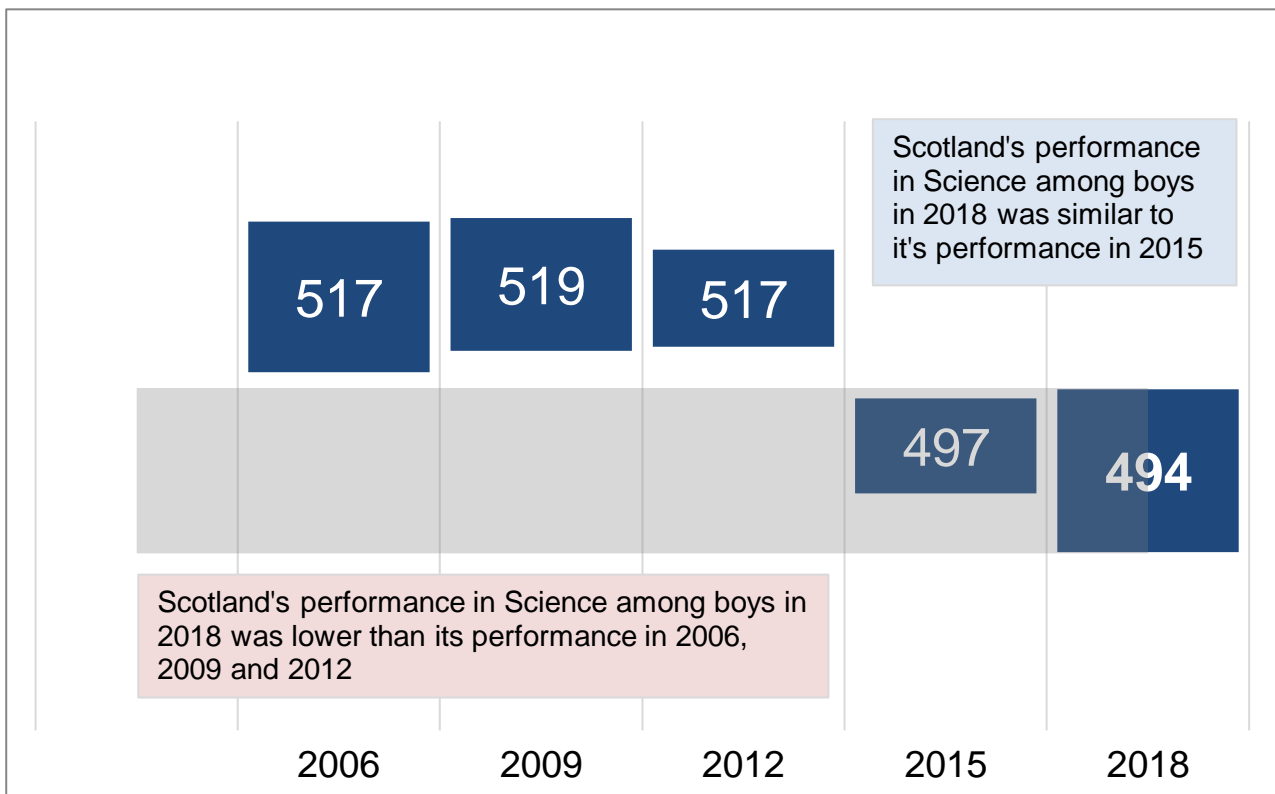
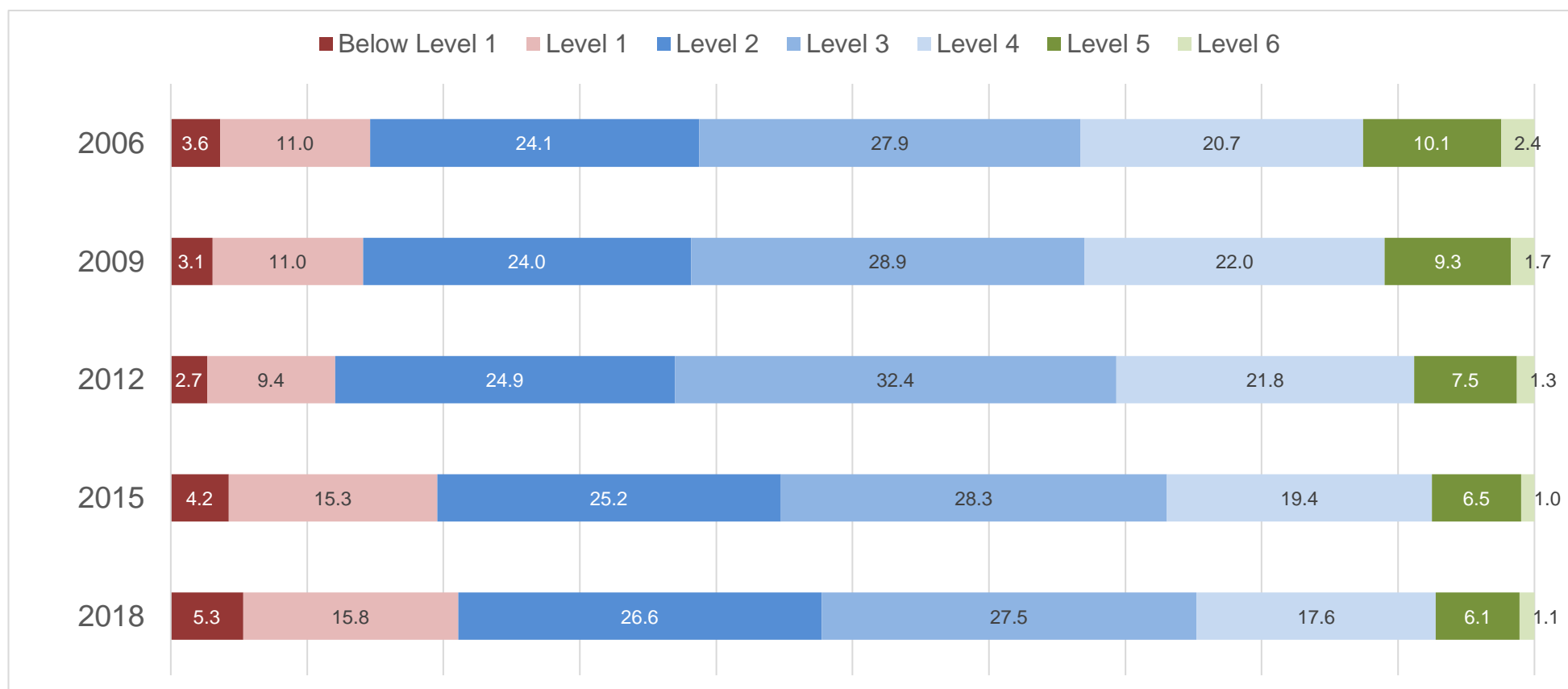


Chart 6.1.4 Scotland's science scores, by [PISA Proficiency Level](#), 2006-2018



As set out in Chapter 2, the OECD categorise students into Levels according to their ability to undertake certain tasks. However the group below Level 2 merits particular attention, as the OECD consider that Level 2 is the baseline of ability to participate effectively in society.

In 2018, 21.1 per cent of students in Scotland performed below PISA Level 2 in Science. This was similar to 2015, but higher than 2006, 2009 and 2012. In 2018, 7.2 per cent of students in Scotland performed at PISA Level 5 or better in Science. This was similar to 2012 and 2015 but lower than 2006 and 2009.

6.2 Scotland's performance in Science relative to countries in the OECD and UK administrations

1. Scotland's [mean score](#) in Science in 2018 of 490 was higher than 11 countries, including Iceland (475) and Italy (468). It was similar to 15 countries, including Northern Ireland (491), Wales (488) and the OECD average (489). It was lower than 13 countries, including England (507) and the UK as a whole (505). See [Chart 6.2.1](#) for more information. Comparisons to non-OECD countries can be found on our new [PISA dashboard](#).
2. Scotland's mean score in Science among girls in 2018 was higher than eight countries, similar to 15 countries and lower than 16 countries ([Chart 6.2.2](#)).
3. Scotland's mean score in Science among boys in 2018 was higher than 11 countries, similar to 20 countries and lower than eight countries ([Chart 6.2.3](#)).
4. Scotland's gender gap in Science of -8 points (girls – boys) was lower than 13 countries, similar to 26 countries, the OECD average and the UK as a whole and higher than no countries.
5. In 2018, second generation [immigrant students](#) in Scotland (502) performed higher than or similar to all OECD countries in Mathematics, with only Singapore and Macao (China) of the non-OECD countries having a higher performance than Scotland. Performance among first generation immigrant students in Scotland (509) was also higher than or similar to all OECD countries in Mathematics.
6. In 2018, 21.1 per cent of students in Scotland performed below [PISA Level 2](#) in Science. This was higher than 10 countries and also higher than the UK as a whole. It was similar to 19 countries and the OECD average and lower than 10 countries ([Chart 6.2.4](#)).
7.2 per cent of students in Scotland performed at PISA Level 5 or better in Science. This was lower than 10 countries and the UK as a whole, similar to 16 countries and the OECD average and higher than 13 countries ([Chart 6.2.5](#)).
7. The [share of variation](#) in science test scores that was explained by students' background was 10.1 per cent ([Chart 6.2.6](#)). Among OECD countries and UK administrations, this was lower than nine countries, similar to 30 countries and higher than no countries.
8. The [ESCS gradient](#) shows how much score varies on average with each step (one point) in social background. The ESCS gradient was 36 points in the science assessment for Scotland ([Chart 6.2.7](#)). Among OECD countries and UK administrations, this was lower than four countries, similar to 30 countries and higher than five countries, including Wales (24 points).

Chart 6.2.1 PISA science scores of OECD countries (plus three other UK administrations), relative to Scotland, 2018

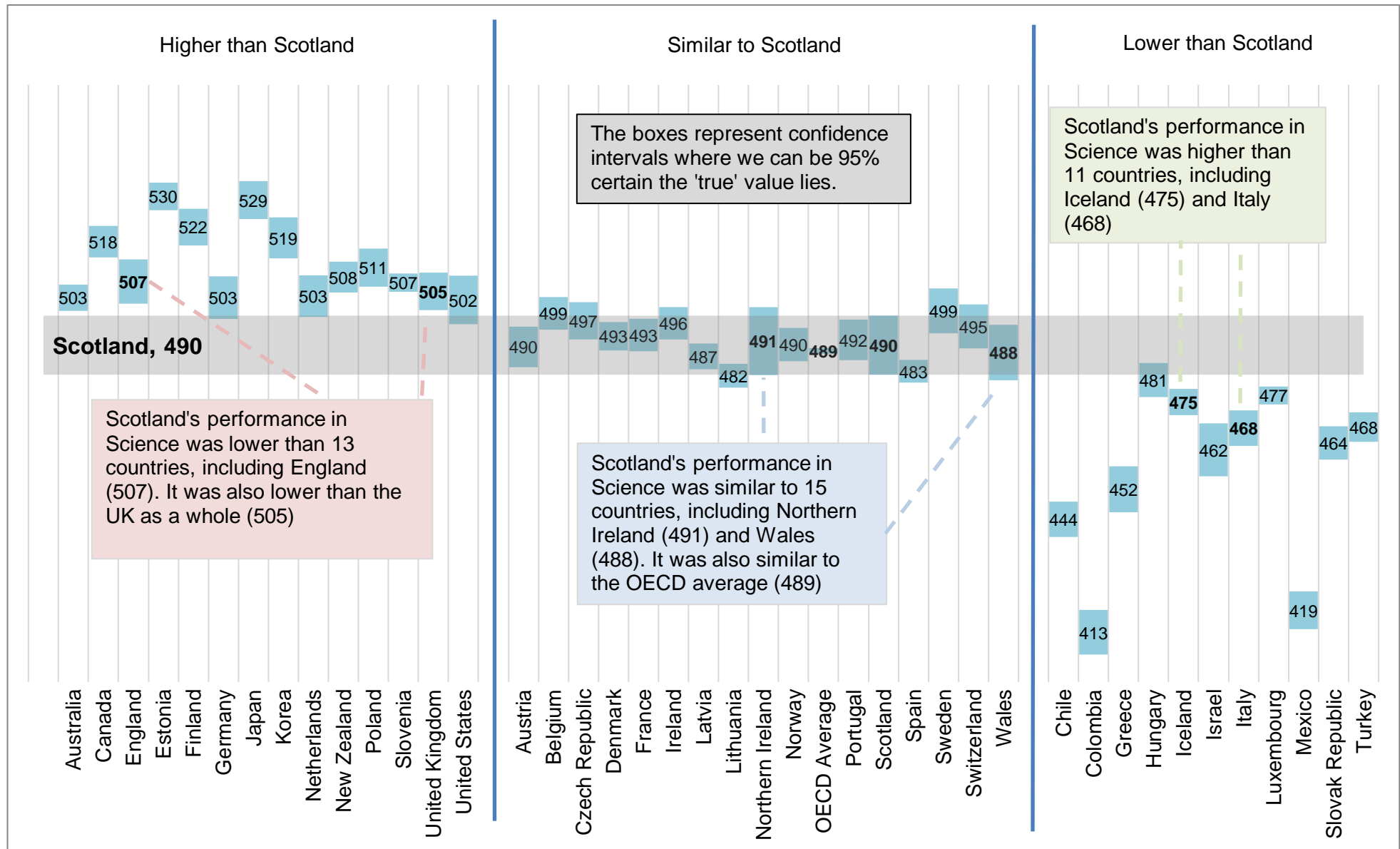


Chart 6.2.2 PISA science scores among **girls** in OECD countries, relative to Scotland, 2018

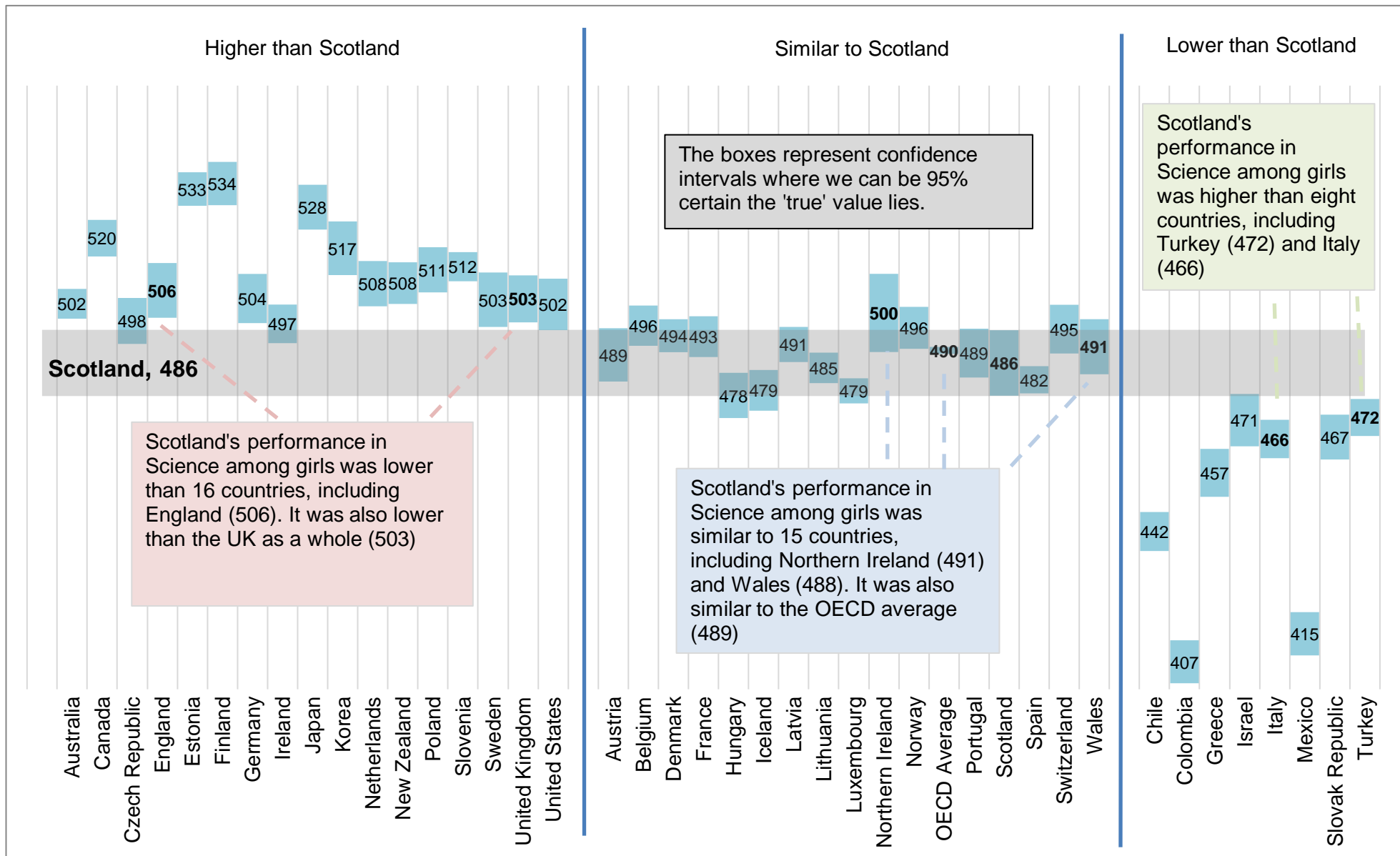


Chart 6.2.3 PISA science scores among **boys** in OECD countries, relative to Scotland, 2018

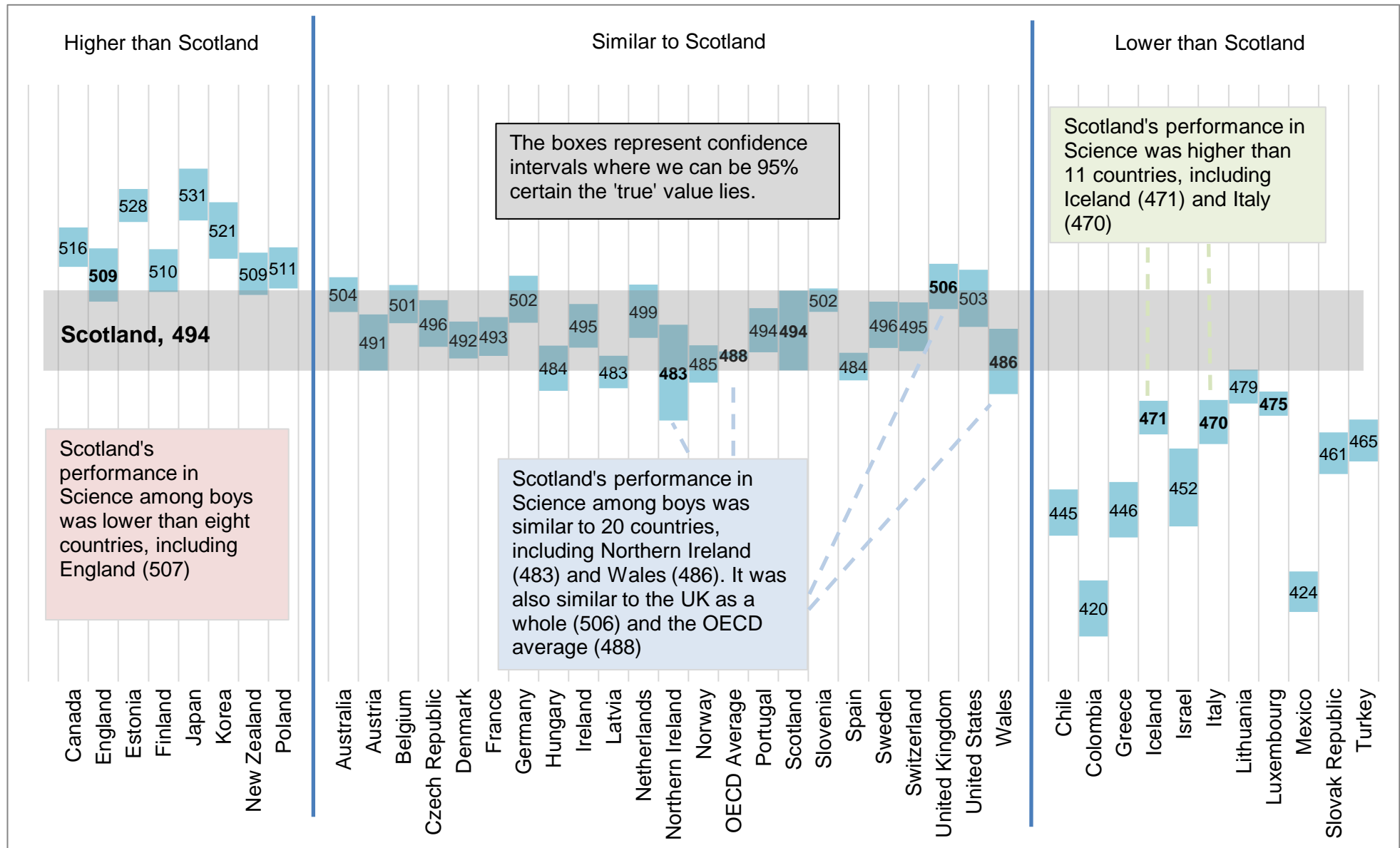
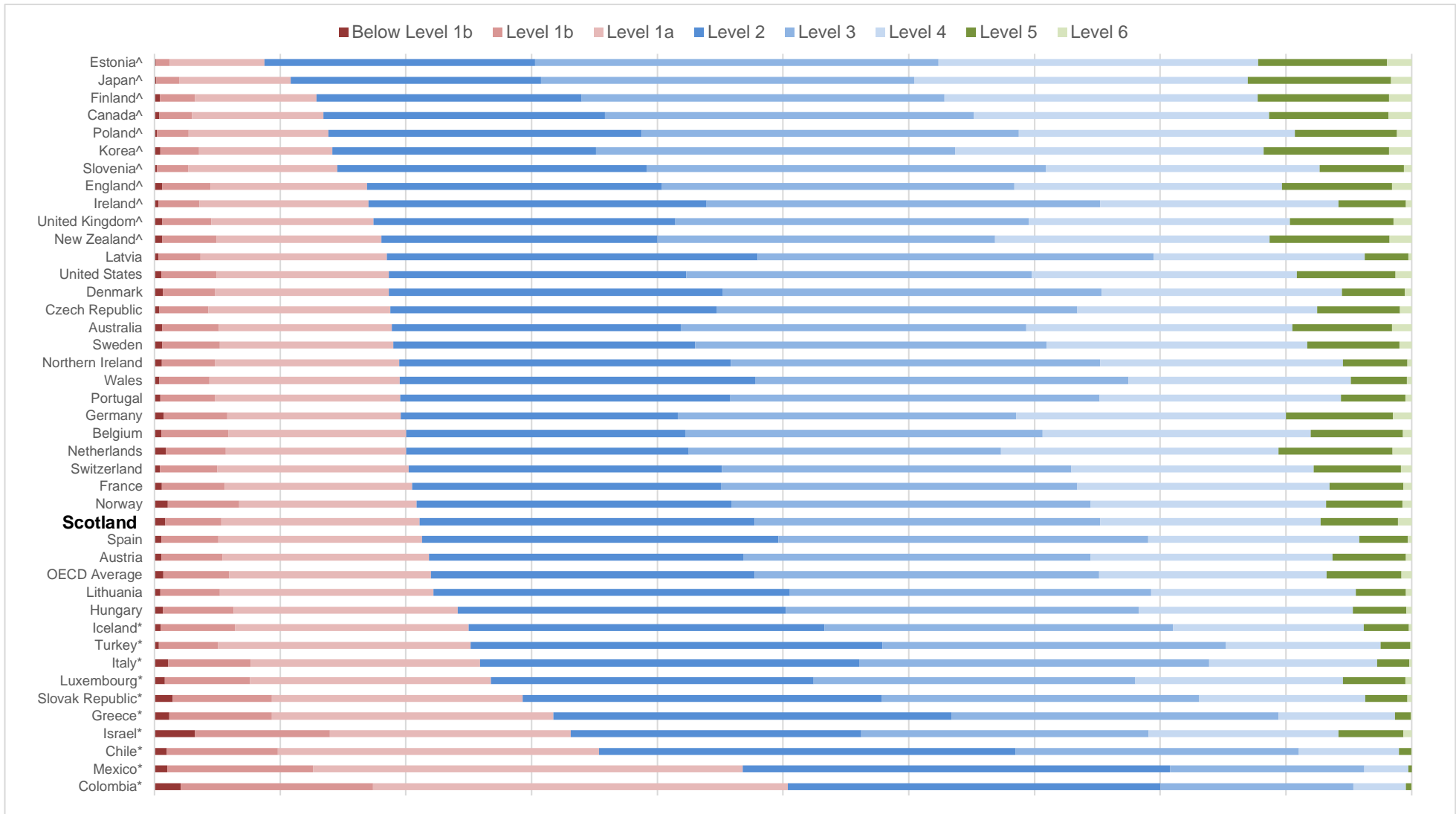
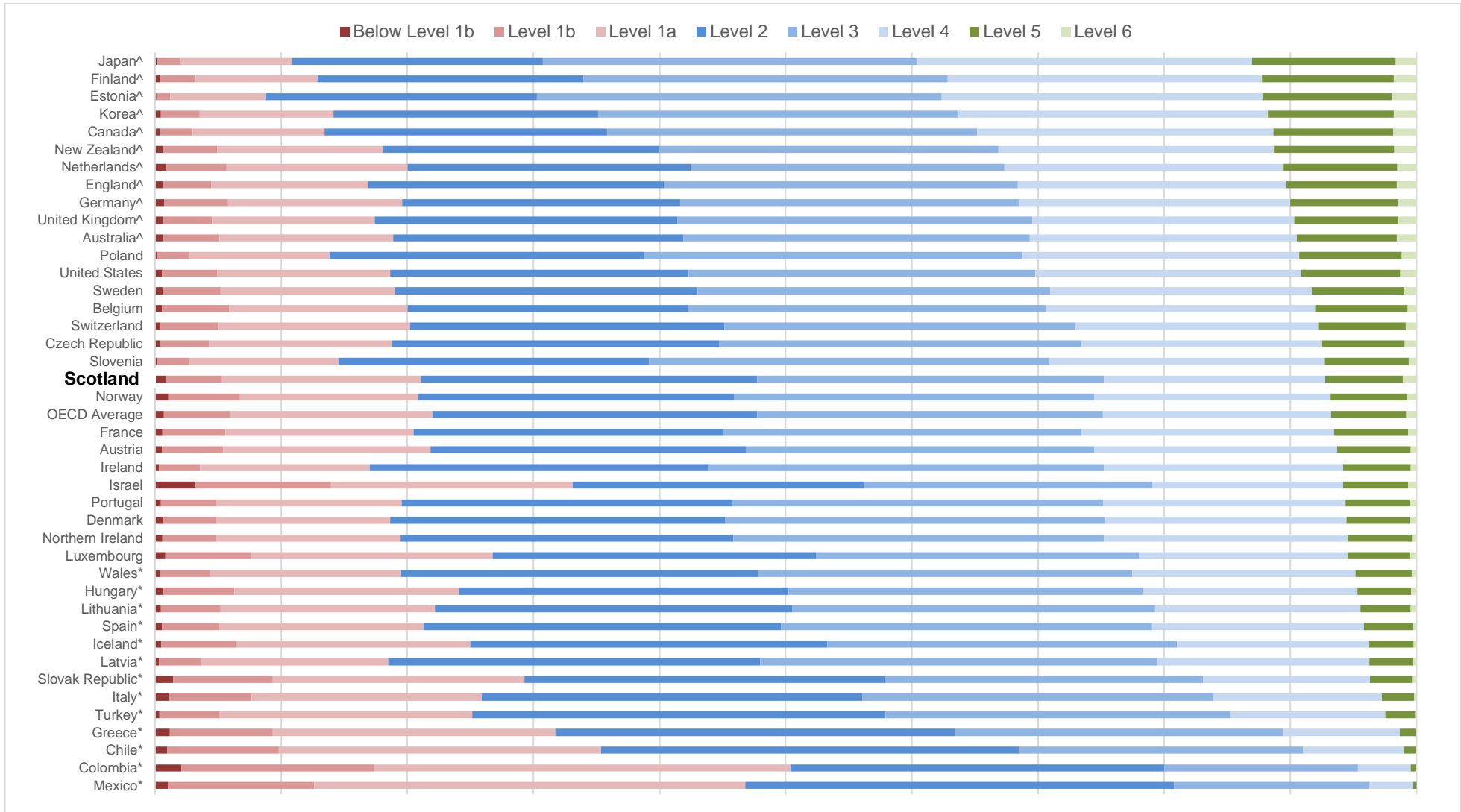


Chart 6.2.4 **Proficiency Levels** in Science in OECD countries, arranged by percentage of students **below Level 2**, 2018



In 2018, 21.1% of students in Scotland performed below PISA Level 2 in Science. This was higher ([^]) than 10 countries and the UK as a whole, similar to 19 countries and the OECD average and lower (^{*}) than 10 countries.

Chart 6.2.5 **Proficiency Levels** in Science in OECD countries, arranged by percentage of students at **Level 5 or better**, 2018



In 2018, 7.2% of students in Scotland performed at PISA Level 5 or better in Science. This was higher (*) than 13 countries, similar to 16 countries and the OECD average and lower (^) than 10 countries and the UK as a whole.

Chart 6.2.6 [Share of variation](#) in Science performance explained by ESCS in OECD countries, relative to Scotland, 2018

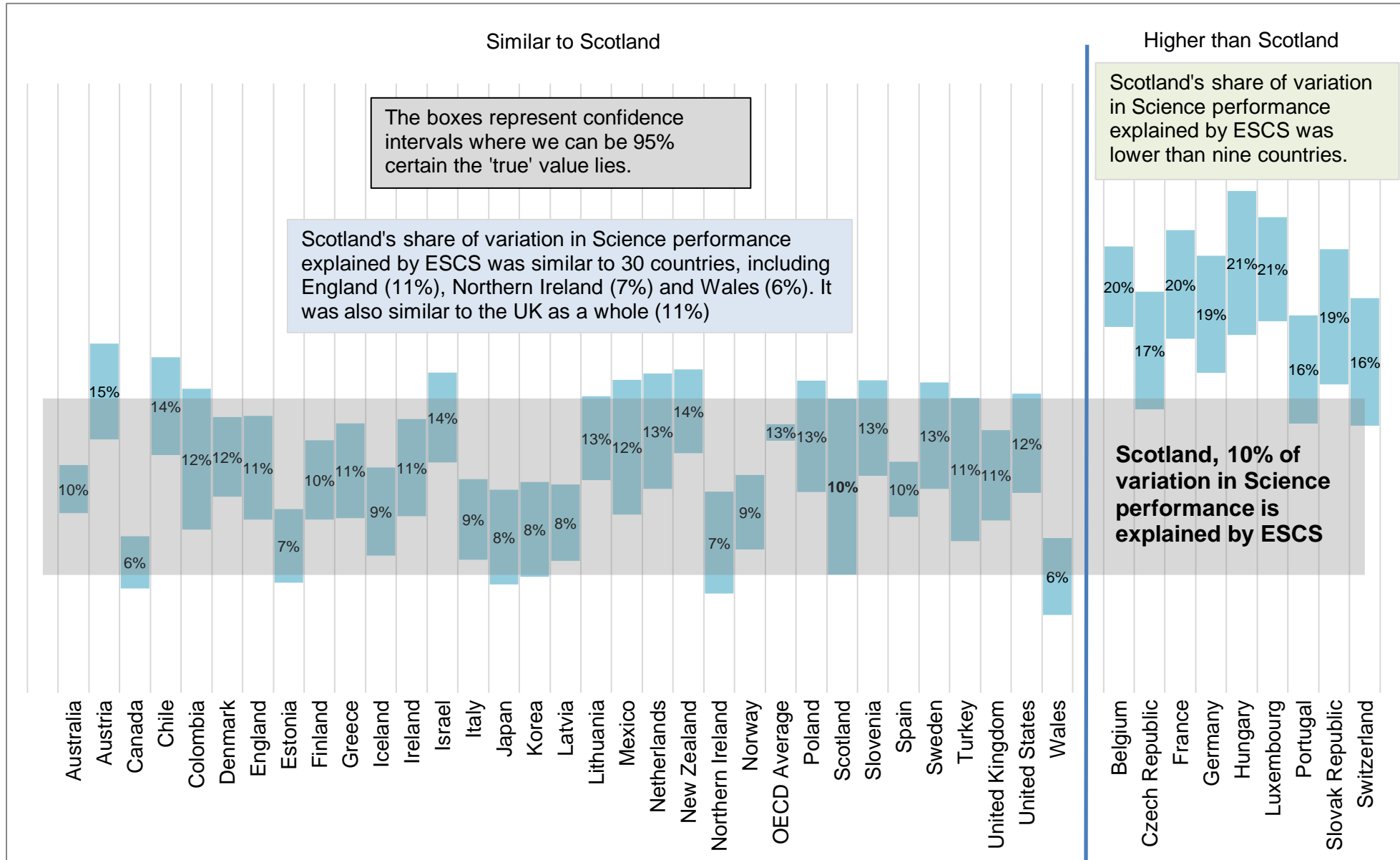
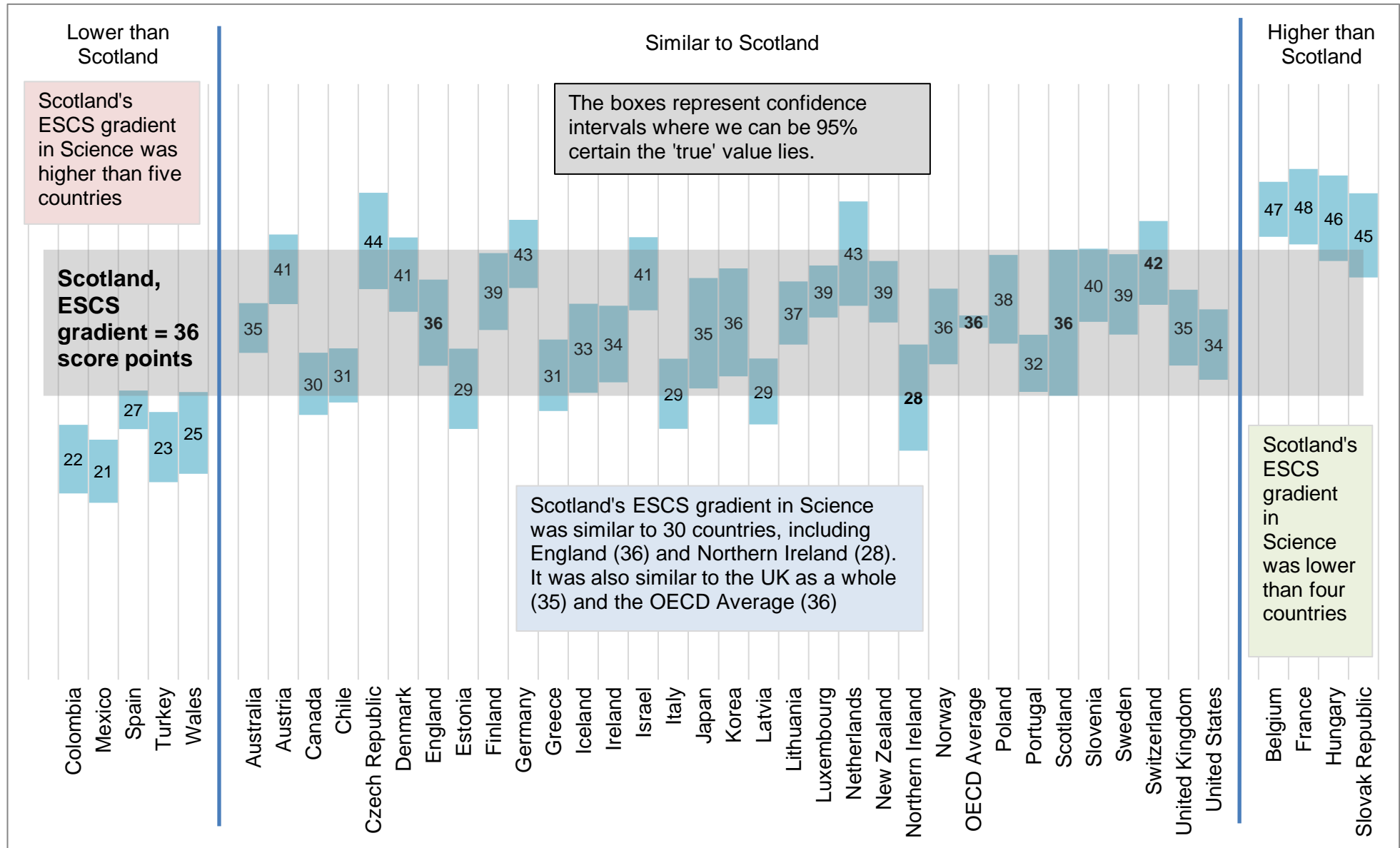


Chart 6.2.7 [ESCS gradient](#) in Science in OECD countries, relative to Scotland, 2018



7. School, Student and Teacher Questionnaire Responses

The PISA assessments are supplemented by background questionnaires. Pupils are asked about their motivations for study, attitudes to school, beliefs about reading, studying and their socio-economic background. Headteachers are asked about the challenges facing their schools, organisation and factors that they believe affect their students' performance.

Student experience and views

Attitudes to learning

1. Pupils in Scotland had a positive view about improving intelligence through learning (a 'growth mindset'). Pupils were less likely than the OECD average to agree that 'your intelligence is something about you that you can't change very much' – 71.4 per cent disagreed or strongly disagreed with this statement compared to an OECD average of 62.6 per cent.
2. When asked about views on self-efficacy, pupils in Scotland agreed with the statements, 'I usually manage one way or another' (90.9 per cent), 'I feel proud that I have accomplished things' (87.4 per cent), 'I feel that I can handle many things at one time' (68.0 per cent), 'My belief in myself gets me through hard times' (60.8 per cent), and 'When I'm in a tricky situation, I can usually find my way out of it' (82.4 per cent).
3. Pupils were more likely than the OECD average to state that a fear of failure has a negative impact on them. 65.2 per cent of pupils agreed or strongly agreed with the statement, 'when I am failing, I worry about what others think of me' (compared to the OECD average of 56.4 per cent). 73.2 per cent of girls in Scotland agreed with this statement, compared to 56.8 per cent of boys.
4. When answering the question, 'when I am failing, this makes me doubt my plans for the future', 72.0 per cent of pupils in Scotland agreed (higher than the OECD average of 53.8 per cent, but similar to the UK figure of 70.5 per cent). 83.6 per cent of girls in Scotland agreed with this statement, compared to 59.7 per cent of boys.

Feelings about school

5. Almost two-thirds of pupils (64.7 per cent) in Scotland agreed with the statement, 'I feel like I belong at school', lower than the OECD average of 70.7 per cent. In the UK, the figure was 62.2 per cent.
6. Three quarters of pupils (75.1 per cent) agreed or strongly agreed with the statement, 'I make friends at school easily'. This is similar to the OECD average (75.2 per cent) and the figure for the UK (73.1 per cent).

Bullying

7. 11.4 per cent of students in Scotland reported being frequently bullied, which was higher than the OECD average (7.8 per cent), but similar to the UK figure. This is lower than the figure for Scotland in 2015 (13.4 per cent).

Attendance

8. 77.9 per cent of Scottish students said that they never skipped some classes when referring to the two weeks prior to the PISA test, which was higher than the OECD average (72.7 per cent), but lower than the UK figure (84.3 per cent).
9. 54.6 per cent of students in Scotland stated that they never arrived late for school when referring to the two weeks prior to the PISA test, which was similar to the OECD average (52.4 per cent), and lower than the UK figure (60.6 per cent).

Expectations for the future

10. 76.9 per cent of pupils stated that they aspired to a high skilled job, ranging from 68.2 per cent in the lowest ESCS quarter to 84.9 per cent in the highest quarter. Pupils deemed to be disadvantaged by ESCS were more likely to aspire to a highly skilled job without completing a tertiary degree (43.6 per cent compared to 9.5 per cent for those not deemed disadvantaged). 60.4 per cent of all students expected to complete tertiary education (lower than the UK as a whole and the OECD average).
11. Pupils were asked about whether they were expecting to enter certain professions³ in the future. 10.7 per cent (similar to the OECD, lower than the UK as a whole) of pupils indicated that they expected to work in the science and engineering profession (14.4 per cent of boys and 7.2 per cent of girls); 13.1 per cent (lower than the OECD and the UK as a whole) indicated the health profession (6.4 per cent of boys and 19.1 per cent of girls); and 3.9 per cent indicated the ICT profession (7.3 per cent of boys and 0.8 per cent of girls). For top performers in maths and science in PISA, 18.9 per cent expected to work in the science and engineering profession.

Confidence in reading ability

12. Almost four fifths of pupils in Scotland agree or strongly agree with the statement, 'I am a good reader'. However, this represented a lower proportion compared to the UK as a whole. 78.0 per cent of girls in Scotland agreed or strongly agreed with 'I am a good reader', compared to 83.3 per cent in the UK as a whole. 69.0 per cent of girls agreed or strongly agree with 'I am able to understand difficult texts' compared with 73.0 per cent in the UK as a whole, and 73.7 per cent of girls agreed or strongly agreed with 'I read fluently' compared to 78.0 per cent in the UK as a whole.

³ Note that some of this data had a lower response rate than other questions (below 75%)

13. Boys confidence in reading was more in line with the rest of the UK, although there was still a lower proportion of boys in Scotland agreeing or strongly agreeing with 'I am a good reader' than in the UK as a whole (77.3 per cent vs 80.9 per cent). Compared to the OECD, boys in Scotland were much more likely to agree with 'I am a good reader' (77.3 per cent vs 65.7 per cent) and 'I am able to understand difficult texts' (79.0 per cent vs 68.0 per cent).
14. Girls in Scotland were much more likely than girls in the OECD to agree or strongly agree with 'I find it difficult to answer questions about a text' (38.4 per cent vs 25.6 per cent). They were also more likely to say this than girls in the UK as a whole (28.8 per cent). The same was also true for boys in Scotland, though the difference was not as marked (33.8 per cent vs 27.4 per cent (OECD) and 30.9 per cent (UK)).

Students' views on reading enjoyment

15. Girls in Scotland were more likely than the OECD to "agree or strongly agree" to the following statements:
- "I read only if I have to" (50.9 per cent vs 39.6 per cent)
 - "I read only to get the information I need" (49.4 per cent vs 38.9 per cent)
 - "For me, reading is a waste of time" (26.0 per cent vs 20.1 per cent)

They were less likely than the OECD to "agree or strongly agree" to:

- "Reading is one of my favourite hobbies" (31.1 per cent vs 43.4 per cent)
 - "I like talking about books with other people" (35.5 per cent vs 46.5 per cent)
16. Compared to the UK as a whole, girls in Scotland were more likely to agree or strongly agree to "I read only if I have to" (50.9 per cent vs 46.8 per cent) and less likely to agree or strongly agree to "Reading is one of my favourite hobbies" (31.3 per cent vs 35.7 per cent) and "I like talking about books with other people" (35.5 per cent vs 39.1 per cent).
17. Boys in Scotland were more likely than the OECD to "agree or strongly agree" to the following statements:
- "I read only if I have to" (64.3 per cent vs 58.6 per cent)
 - "I read only to get the information I need" (64.9 per cent vs 60.5 per cent)

They were less likely than the OECD to “agree or strongly agree” to:

- “Reading is one of my favourite hobbies” (15.6 per cent vs 24.0 per cent)
- “I like talking about books with other people” (22.7 per cent vs 26.7 per cent)

18. These findings were similar to the UK as a whole, with the exception of “Reading is one of my favourite hobbies”, where boys in Scotland were less likely than boys in the UK as a whole to agree or strongly agree (15.6 per cent vs 18.5 per cent)

Time spent reading for enjoyment

19. 71.6 per cent of girls and 81.1 per cent of boys in Scotland said “I don’t read or I read less than 30 minutes a day”. This was higher than the OECD average (57.2 per cent of girls and 75.5 per cent of boys). The figure of 71.6 per cent for girls in Scotland was higher than the UK as a whole (68.7 per cent), but the figure for boys was similar (81.1 per cent vs 81.3 per cent).

ICT use outside of school hours for leisure

20. Both boys and girls in Scotland and the UK as a whole were more likely than the OECD average to use digital devices every day or almost every day for the following activities: Chatting online, participating in social networks, browsing the internet for fun and downloading music, films, games or software from the internet.

21. Boys in Scotland (51.8 per cent) were more likely than boys in the OECD (43 per cent) and in the UK as a whole (47.4 per cent) to use digital devices every day or almost every day to play one player games and collaborative online games. By contrast, girls in Scotland (7.3 per cent) were less likely to play collaborative online games than the OECD average (9.8 per cent), although this was similar to the UK as a whole (7.8 per cent).

22. Boys in Scotland were more likely than boys in the UK as a whole to read the news online several times a day (26.2 per cent vs 22.3 per cent), though they were less likely to read the news online several times a day than the OECD average (29.3 per cent). Girls in Scotland were also less likely than the OECD average to read the news several times a day (18.9 per cent vs 25.5 per cent). This was similar to the UK as a whole (17.8 per cent).

Student views on teachers

Teacher enthusiasm

23. Scottish students had positive views on the enthusiasm of their teachers. 59.9 per cent agreed or strongly agreed with the statement, 'the enthusiasm of the teacher inspired me', higher than the OECD average of 55.0 per cent.
24. 79.2 per cent of Scottish students agreed or strongly agreed with the statement that 'the teacher showed enjoyment in teaching, which was higher than the OECD average of 74.1 per cent.
25. 77.4 per cent of Scottish students agreed or strongly agreed that, 'It was clear to me that the teacher liked teaching us', which was higher than the OECD average of 73.2 per cent.

Relations with teachers

26. 77.4 per cent of Scottish students agreed or strongly agreed that, 'It was clear to me that the teacher liked teaching us', which was higher than the OECD average of 73.2 per cent.
27. Scottish students were more likely to report high levels of support from their teachers, than across the OECD. The teacher was more likely to be reported as "shows an interest in every student's learning" in "every lesson" (43.5 per cent vs. 38.2 per cent).
28. A similar pattern was seen for "The teacher gives extra help when we need it". This was reported as true in "every lesson" by 51.5 per cent of students (vs. 43.9 per cent for the OECD).
29. Teachers were more likely to be reported to be persistent than across the OECD. Scottish students said "the teacher continues teaching until the students understand" in "Every lesson" (43.9 per cent vs. 39.4 per cent).

Teacher feedback

30. Scottish students were more likely to report that teachers would give them feedback than students across the OECD. They were more likely to say that "the teacher gives me feedback on my strengths in this subject" with Scottish students more likely to say this happened in every lesson or many lessons (48.8 per cent compared to 33.7 per cent).
31. There was a similar pattern for students reporting 'the teacher tells me in which areas I can still improve', with 9.3% of students reporting than this 'never or almost never' happens compared with 19.8% across the OECD.
32. 53.7 per cent of students in Scotland reported that 'the teacher tells me how I can improve my performance' in every lesson or many lessons, which is higher than the OECD average of 44.5 per cent.

Headteachers' views

Although the estimates of headteachers' responses have more uncertainty because of the smaller sample, we are still able to report statistically significant differences against the OECD. Estimates are shown as the proportion of pupils in a school where headteachers' respond in a particular way.

Teachers

33. Headteachers were asked whether a range of teacher behaviours hindered learning in their schools. 28.3 per cent of headteachers said that 'teachers not meeting individual students' needs was a factor 'to some extent' (similar to the OECD and UK averages), with the others saying 'very little' or 'not at all'.
34. Headteachers were less likely than the OECD average to state that 'teachers not being well prepared for classes' was a factor in their school, with 96.7 per cent of headteachers saying 'not at all' or 'very little', compared to an OECD average of 87.3 per cent.

School capacity

35. 19.4 per cent of students in Scotland were in a school which the headteacher said was affected by a lack of educational material and 21.1 per cent were in a school affected by a lack of physical infrastructure. This was similar to the OECD average.
36. Students in Scotland were more likely than the OECD average to be in a school where a lack of teaching staff (46.3 per cent compared to 32.6 per cent) affected the school to some extent. However, they were less likely than the OECD average to be in a school affected by poorly trained teaching staff (8.4 per cent compared to 15.1 per cent).
37. A higher proportion of students than the OECD average were in schools where teacher absenteeism was said to be a factor (30.5 per cent compared to 17.9 per cent), but a lower proportion were affected by teachers not being well prepared (3.3 per cent compared to 12.7 per cent).

Parental involvement

38. Headteachers were asked about the proportion of parents that took part in various school activities. When asked for the proportion of parents that discussed their child's progress with a teacher on their own initiative, the average proportion from headteacher responses was 45.4 per cent of parents, which was similar to the OECD average. The figure for discussing progress on the initiative of a teacher was 56.6 per cent, which was also similar to the OECD average.

Headteachers estimated an average of 7.4 per cent of parents volunteering in physical or extracurricular activities, which was lower than the OECD average, but similar to the UK as a whole.

8. Additional Information

PISA Dashboard

Some additional information is available on our new PISA dashboard, which can be found at the following link:

https://public.tableau.com/profile/sg.eas.learninganalysis#!/vizhome/PISADashboard_15753653002750/InternationalComparison

This allows users to see how Scotland performs against all other countries who took part in PISA, including countries not in the OECD. Initially this will focus on mean scores overall, by gender and by immigration background. It is the intention to add to this dashboard once more analysis has been done.

Supplementary Tables

The data behind the PISA dashboard, as well as data used in all charts and tables of this publication, are also available in table form on the Scottish Government website in the supporting files of this report.

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Correspondence and enquiries

For enquiries about this publication please contact:

Keith Dryburgh,
Scottish Government Learning Analysis,
Telephone: 0131 244 5310,
e-mail: keith.dryburgh@gov.scot

For general enquiries about Scottish Government statistics please contact:

Office of the Chief Statistician, Telephone: 0131 244 0442,
e-mail: statistics.enquiries@scotland.gsi.gov.uk

How to access background or source data

The data collected for this social research publication:

- are available in more detail through Scottish Neighbourhood Statistics
- are available via an alternative route on the OECD PISA webpage at www.oecd.org/pisa
- may be made available on request, subject to consideration of legal and ethical factors.
- cannot be made available by Scottish Government for further analysis as Scottish Government is not the data controller.

Complaints and suggestions

If you are not satisfied with our service or have any comments or suggestions, please write to the Chief Statistician, 3WR, St Andrew's House, Edinburgh, EH1 3DG, Telephone: (0131) 244 0302, e-mail statistics.enquiries@scotland.gsi.gov.uk.

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