

## **POST-ELECTION BRIEFING: IMPROVING PUBLIC UNDERSTANDING OF STATISTICS AND DATA**

### **RSS manifesto ask**

**A new approach to mathematics education with a more fulfilling curriculum placing a greater emphasis on data. Alternative methods of assessment should be explored including considering whether non-examination assessments might be appropriate.**

### **Summary**

There are a range of challenges with the current curriculum, including students not being equipped with the skills they need to navigate daily life or for the world of work. Many students are not enjoying learning maths, statistics, and data science, and are not seeing the useful applications of these disciplines. The curriculum currently focuses on dated examples and manual calculations rather than engaging, relevant examples and data – when knowing how to interpret and work with data from the youngest years of life is key to navigating and thriving in this data-driven era.

We discuss these challenges in our [note on statistics and data in the curriculum](#) (2023) and have recently published recommendations on statistics and data in the UK curriculum. We recommend incorporating real-world, relevant, engaging examples in the curriculum, and increasing the focus on data, statistical thinking, and critical evaluation. We propose that non-examination assessment – ie project- or coursework – should be considered, as statistics is a practical subject and this may better allow students to develop and demonstrate statistical thinking.

### **What's the problem?**

The current system is not equipping students with relevant skills – citizens face a data deluge and need to be able to interpret data, work with AI and critically evaluate health, climate and political claims (among others) in order to navigate daily life, be informed citizens and thrive in the world of work.

Many students are not enjoying studying maths, statistics and data science, and are not realising the range of pertinent applications that these subjects can offer. The curriculum uses dated and often unstimulating examples and due to the quantity of content to be covered in the curriculum, there is little room for exploration for students to learn within topics of interest to them. There is an overly strong focus on manual calculations and not enough focus on skills relevant to our current era, for example the investigative/statistical cycle (planning and answering questions using data).

Assessment does not currently reflect the practical nature of statistics, and the current exam-based assessment restricts the types of skills tested and impedes students' ability to demonstrate investigative skills that may be better assessed through project- or coursework.



Current assessment does not capture specific skills (for example, it is possible to pass Maths GCSE by skipping many statistics questions), meaning that pupils cannot evidence their specific skills to future employers. Limitless resits of GCSE Maths for students who have not passed ('the forgotten third') only demotivate students further and widen inequalities – this is not a recipe for success to equip this population with the skills they need to navigate life. Current assessment practices place large amounts of stress on pupils, leaving little time for teachers and students to explore areas of interest.

We set out further detail on the challenges in the education system in our [thinking about statistics and data in the curriculum](#) (originally published in response to then-Prime Minister Rishi Sunak's 'Maths to 18' proposals). At the RSS, a key goal of ours is to [support public understanding and engagement](#), including through education, by advocating to improve statistics and data content across the curriculum and considering the best methods by which to assess these subjects.

### How to fix it

We have recently published a set of recommendations on statistics and data within the curriculum. We recommend that real-world, relevant examples are used to engage students. We call for more emphasis on interpreting data, for example allowing students to answer questions using real-world interesting datasets (eg on gender inequality, migration, climate change, social media, sports, etc). Many datasets are freely available online and are interactive. The importance of relevant, real-world understanding of data and maths is also reflected in the Royal Society's [A Manifesto for Science](#) and the Council for the Mathematical Sciences' [Maths Manifesto](#).

We propose several options to improve the teaching of statistics and data within the current curriculum structure, including separating out statistics and data from maths, or increasing the focus on statistics and data within the maths stream. Our preferred option includes providing students with a choice at GCSE – so students could either take two GCSEs (one in maths and one in statistics and data) or one dual GCSE, composed of proportionate components of maths and statistics/data. We also advocate for the joining-up of statistics and data across different disciplines (eg geography, biology, psychology, business studies etc).

We believe that it is necessary to [first consider the skills](#) we want children to leave school with before considering how this translates to interesting topics, coherent content, engaging delivery and assessment of relevant skills. We should assess the skills we value; not value the skills we happen to be assessing. Incorporating coursework into assessment practices could allow for better assessment of practical statistical and data skills, allowing students to plan and answer questions of interest, and may better prepare students for future real-world projects. However, care must be taken to tackle issues including bias in teacher assessment, varying levels of parent or teacher support (which can exacerbate inequalities) and plagiarism, especially given the widespread popularity of AI and chatbots.

We welcome the recently-launched [Curriculum and Assessment Review](#) and the opportunity to improve the teaching and assessment of maths, statistics and data. In [our letter to then-Shadow](#)



[Secretary of State for Education Bridget Phillipson](#) we also welcomed her focus on the importance of real-world, relevant maths education, and the importance of looking to improve maths education from an early age (pre-16).

### **RSS manifesto ask**

**A year-on-year increase in the number of qualified maths teachers in schools including by: expanding scholarship schemes for recruitment; guaranteeing 35 hours of subject-related CPD annually for STEM teachers; and reviewing teachers' salaries.**

### **Summary**

There are [well-known issues with teacher recruitment, training and retention](#). We are facing a shortage of secondary school teachers and recruitment targets are not being met in key subjects including maths. Issues include pay, wellbeing and a lack of opportunity for professional development.

As part of the Council for the Mathematical Sciences, we call for a year-on-year increase in maths teachers, by expanding scholarship schemes and guaranteeing subject-related CPD. Scholarship schemes have been demonstrated to boost recruitment (in a step to increase competitiveness against the variety of highly-paid alternative professions for STEM graduates) and subject-related CPD boosts teacher wellbeing and confidence, providing opportunities for progression and supporting retention. In addition, we call for a review of teachers' salaries – to ensure competitiveness across the levels – to support both recruitment and retention.

### **What's the problem?**

Teacher pay has been [decreasing in real terms](#) for over ten years. This is in contrast to pay in the private sector and is especially an issue for STEM subjects such as maths where recent graduates have a wide range of alternative highly-paid options. Competitive salary continues to be an issue once teachers are in post, as does a lack of opportunity for progression, impeding retention.

This shortage of maths teachers has negative impacts on the teaching of maths, statistics, and data. Under-qualified teachers may end up teaching subjects (or parts of subjects) that they do not feel confident to teach. Teachers who are overworked and are not enthusiastic about what they are teaching will be less able to inspire and equip their students with the relevant knowledge and skills. A shortage of teachers confident in statistics leads to fewer schools offering this subject.



The shortage of maths teachers is especially important given the recently-launched [Curriculum and Assessment Review](#) and the welcome opportunity to improve the teaching and assessment of maths, statistics and data. Improvements are needed and will require a healthy workforce of qualified teachers. At the RSS a key goal of ours is to [support public understanding and engagement](#), beginning from school-age, and this includes considering how to support and upskill teachers.

### How to fix it

To reduce the number of unqualified maths teachers who are teaching the subject, the government should aim to increase the number of qualified maths teachers (those with a maths degree (or other degree with a high level of mathematical content)). As part of the Council for the Mathematical Sciences – and outlined in the [Maths Manifesto](#) – we call for a year-on-year increase in the number of qualified maths teachers, by expanding scholarship schemes for recruitment and guaranteeing 35 hours of subject-related CPD annually (as also called for in the Royal Society's [Manifesto for Science](#)).

There is evidence that scholarships – such as [those introduced recently](#) for shortage subjects – [improve teacher recruitment](#). We call for scholarship schemes to be expanded for shortage subjects with competitive job markets, including maths, to increase entrance into the profession.

CPD is [important for](#) teachers' confidence and helps sustain retention, enabling teachers to seek opportunities for progression (eg increasing status and pay). CPD that is high-quality and relevant to teacher's specific subject (rather than focusing on general activities eg leadership) has been reported to be [particularly valuable](#). We call for 35 hours of subject-related CPD to be ring-fenced annually to provide teachers with these opportunities and sustain retention.

In addition to the above, we call for a review of maths teachers' salaries across the levels, to support both recruitment and retention. The [recent uplift to starting salary for subjects including maths](#) is a good starting point, but this will need to be reviewed over time in relation to inflation and private sector salaries, and consideration of progression should also be taken into account.

### RSS manifesto ask

**The public to be supported with the tools to critically evaluate claims made in the media, including on social media, and to identify potential misinformation. The UK Statistics Authority's (UKSA) role in drawing attention to the misuse of statistics should be bolstered.**



## Summary

Statistics and data are used widely in the media, and misinformation can be rife. The ability to distinguish between trustworthy information and misinformation is key – as this information influences behaviour, from political views to daily activities.

People need to be provided with tools to help them critically evaluate claims they come across in the media (for example, see [RSS guide on critically assessing statistics on social media](#)). We call for a governmental role in this, to raise awareness and equip the public with the necessary skills via public-facing campaigns and resources.

We also call for the role of the UKSA to be bolstered: increased regulation of statistics and data in the media will help members of the public navigate the array of claims being made and will help increase public confidence in the trustworthiness of claims.

## What's the problem?

Statistics and data are widely used in the media and on social media – from backing up political claims to measuring progress and telling stories. There are a range of scenarios that may result in misleading data and statistics being shared, either accidentally or due to purposeful spin.

As our Chief Executive Sarah Cumbers set out in her opinion piece, this was [exemplified during the pre-election period](#), when an array of claims led the chair of the UKSA to urge all parties to use statistics responsibly and ensure that statistical claims enhance understanding rather than misleading.

It can be challenging to know which statistics are trustworthy and which are misleading. This is important as the information we absorb shapes our views and activities – from our political inclinations and voting practices to our daily habits and outlook on the world around us.

At the RSS a key goal of ours is to [support public understanding and engagement](#) and empower citizens to meaningfully engage with the statistics and data that impact the world around us. Statistics and data should be trustworthy and should be communicated in a clear, accessible manner to aid understanding.

**How to fix it**

We have [produced a guide](#) (2024) to help people think critically about the figures they encounter on social media and beyond. The guide covers key aspects to help assess whether figures are trustworthy or require further investigation, including considering the source of the statistics, how they are described and how they are presented graphically. We provide examples to be wary of, including misleading charts, ‘cherry-picking’, and confusing correlation with causation, along with tips to help ‘sense check’ figures.

We believe more such tools and further education and awareness on how to critically interrogate the figures we come across are needed. We call for the government to take a key role in ensuring that the public are equipped with these tools, by providing resources and via public awareness campaigns as well as incorporation into school education.

We also believe that the UKSA, as an independent statutory body, should have a more prominent role in ensuring that statistics and data in the media are used to enhance understanding and not to mislead. The UKSA has the [statutory objective](#) of promoting and safeguarding the publication of official statistics that serve the public good, including ‘regulating quality and publicly challenging the misuse of statistics’. The UKSA makes [public statements](#) when they believe claims are likely to mislead the public and this could impact public confidence or debate, taking into account factors including the impact that the misleading statement is likely to have. While some UKSA interventions are public, many are private.

We call for the role of the UKSA in drawing attention to the misuse of statistics to be bolstered – through increased resourcing and strengthening of legal and enforcement powers. The increased presence of a body to regulate statistical claims in the public domain would enable the public to have confidence that statistics are being used responsibly and are trustworthy and would discourage the misleading use of statistics and data.

