Office for Statistics Regulation

Analytical leadership:

Achieving better outcomes for citizens

March 2024

Executive Summary

This report sets out the findings from the Office for Statistics Regulation's (OSR's) review of analytical leadership. Drawing on case studies, it looks at how analytical leadership can be demonstrated and enabled across government. It is relevant for all who want to foster a stronger, data-driven culture in their organisations, offering actionable suggestions for people in different professions and levels of seniority.

Analytical leadership is a professional way of working with data, analysis or statistics that enables them to be consistently, confidently and competently produced and used as evidence to inform effective data-driven decision-making.

Analytical leadership ensures that the right data and analyses are available within government for informed, effective policy and decision-making to improve the lives of citizens; that analysts are sufficiently skilled and resourced to answer society's most important questions; and that analytical evidence produced by government to make policy decisions is more routinely made available to the public.

Everyone working in government can and should demonstrate analytical leadership, regardless of profession or seniority. Senior leaders have an important role to play, but everyone, if properly equipped and enabled, can help support and foster a professional, evidence-driven culture across government.

When established, analytical leadership supports confidence beyond government in how analytical evidence is produced and used by government, and in policies and wider decisions based on that evidence. Making more government analysis available to those beyond government can also help narrow the gap between the perception of how analysis is produced and used by those within government, who have a broadly positive outlook, compared to those outside government, who can be more sceptical.

Through conversations with analysts across government, OSR has identified six actions that individuals and organisations can take to enable analytical leadership:

1. Foster an evidence-driven culture
2. Demonstrate transparency and integrity
3. Collaborate across organisations to add value
4. Embed structures to support evidence
5. Invest in analytical capacity and capability
6. Draw on analytical standards and expert functions

By combining OSR's **six enablers of analytical leadership** with a commitment to ensuring **Trustworthiness**, **Quality** and **Value** in evidence – taking a **'Think TQV'** approach – everyone in government can demonstrate analytical leadership when working with data, analysis or statistics. In doing so, everyone can contribute to the UK Government's Declaration on Government Reform, to put data more fully at the heart of decision-making, and support how analysis is produced, used and valued.

Introduction

What is analytical leadership and who can do it?

Analytical leadership is a professional way of working with data, analysis or statistics that enables them to be consistently, confidently and competently produced and used as evidence. Effective analytical leadership ensures the right data and analyses are available for informed, effective policy- and decision-making within government; that analysts are skilled and resourced to answer society's most important questions; and that analytical evidence is more routinely made available to the public. It supports public confidence in how analytical evidence is produced and used by government, and in the government policies and decisions based on that evidence, with potential to narrow the current gap on this between those working inside and outside of government.

We saw first-hand how data and analysis entered the spotlight and were used and valued across government during the COVID-19 pandemic. In this context, there was demand from both within and outside of government, including from citizens, for data on which to base personal and organisational decisions. The demand for information about increased costs of living shows the continued profile of analytical evidence and its influence on what is happening within society across important policy questions.

Everyone working in government can and should demonstrate analytical leadership, regardless of profession or seniority. Senior leaders have an important role to play, but everyone, if properly equipped and enabled, can help support and foster a professional, evidence-driven culture across government.

Analytical leadership is key to realising many of the ambitions in the UK Government's Declaration on Government Reform, which set out commitments to put data more fully at the heart of government decision-making. These commitments include:

- using data to evaluate the effectiveness of programmes against ambitions;
- sharing data across government so that policy is informed and government can be held to account;
- bolstering traditional skills in drafting and understanding statistical concepts, with expertise in digital, data and science;
- training ministers in how to assess evidence.

In this context, developing analytical leadership skills and having confidence when working with data and analysis is important for everyone in government.

How can analytical leadership be demonstrated?

Analytical leadership is best demonstrated when departmental cultures and governance structures actively promote the benefits of evidence-driven collaborative working and the development of analytical capability and skills. Crucially, analytical

leadership requires recognition of the value and power of sound analytical evidence for informing robust policy and decisions, and for individuals to be champions for it – recognising it as both an essential government and a public asset when published.

OSR's interest in analytical leadership builds on its previous work on Statistical leadership. Although within government we often differentiate between statistics, data and analysis, to the outside user there is often no difference. Statistics and analysis are intertwined: strong statistics support strong analysis, and both require effective communication to support decision makers and public information needs.

This report shows how analytical leadership can support successful policy and decision-making to ultimately improve the lives of UK citizens. It provides a range of case studies, gathered by OSR through discussions with senior analytical leaders (see Annex A) to illustrate some of the impressive things that are possible when people working in government demonstrate effective analytical leadership. We hope these case studies will inspire and help others in government to take similar positive action. They are grouped under **six enablers of analytical leadership**, which people from different professions and levels of seniority can draw on to enable a stronger, data-driven culture within their organisations.

Enablers of analytical leadership

1. Foster an evidence-driven culture. This enabler highlights the importance of facilitating evidence-based policy and decisions; having non-analysts create demand for analytical evidence; having visible analytical leaders at the highest levels; and championing outstanding analytical work.
2. Demonstrate transparency and integrity**.** This enabler demonstrates the need for analytical evidence to feed into policy and meet public needs in an orderly and transparent way; to demonstrate leadership through the effective communication of evidence; and the integrity to challenge evidence misrepresentation and misuse, including by correcting the public record.
3. Collaborate across organisations to add value**.** This enabler shows the importance of working across professional and organisational silos; combining expertise from multiple professions; and adding value with external expertise.
4. Embed structures to support evidence**.** This enabler illustrates the need for structures that integrate evidence into policy and decision-making by default; and structures that support effective cross-profession collaboration.
5. Invest in analytical capacity and capability**.** This enabler highlights the importance of improving analytical capability; embracing new tools to meet future evidence demand; and pooling resources to improve capacity.
6. Draw on analytical standards and expert functions**.** This enabler demonstrates the importance of promoting and following professional analytical standards; and drawing on UK analytical expertise.

TQV: a framework to support analytical leadership and public confidence

Different professions across government utilise many important frameworks that support aspects of analytical leadership (see Section 6). The standards for government official statistics, set out in the UK Statistics Authority Code of Practice for Statistics, are one such framework.

The three pillars of the Code – **Trustworthiness**, **Quality** and **Value** – can be applied more widely than official statistics, to support the way that all government analysis is produced, used and valued, and to support public confidence in government's production and use of evidence. Anyone in government can demonstrate analytical leadership by taking a **'Think TQV'** approach, asking themselves questions like:

'How do I and my organisation ensure…'

1. …we produce and use data, analysis and statistics to inform policy and decision-making with professional integrity in an orderly, secure and transparent way which supports public confidence and helps demonstrate that we are **Trustworthy**?

2. …the analytical evidence that we produce and use to inform or evaluate policy and decisions is based on appropriate data and sound methods, and is of known and suitable **Quality**?

3. …the analytical evidence that we produce and use is sufficiently relevant, accessible and clear and helps to answer questions of significant **Value** for our users, stakeholders or customers, and for public citizens and other beneficiaries, wherever possible?

OSR has published a suite of universal principles that distils the Code down to a few key aspects, which organisations can draw on when thinking about the relevance of, and how to apply, TQV.

However, **'Thinking TQV'** is most powerful once individuals or organisations recognise the value of having a strong **evidence-driven culture** for informing effective policy and decision-making, and/or are motivated to develop one. This is where a focus on the six enablers of analytical leadership is helpful. The following sections of this report show how **'Thinking TQV'** aligns with the **enablers of analytical leadership**.

Next steps

Everyone in government has an important role in championing the use of analytical evidence and being confident in engaging with analytical experts. It is everyone's responsibility to think about their interactions with the data that is produced and/or used as evidence in their roles, and to consider how best to demonstrate analytical

leadership in their work. Doing so will help to ensure that analytical leadership is demonstrated at all levels and in all parts of government, and that the information needs of public citizens are supported. Efforts made here will also support confidence beyond government in how analytical evidence is produced and used by government, and in the policies and wider decisions based on that evidence.

OSR is always delighted to hear and champion case studies that demonstrate effective analytical leadership, or to discuss barriers to analytical leadership. If you have a case study or would like to discuss a topic covered in this report, or analytical leadership more generally, please get in touch at regulation@statistics.gov.uk.

Office for Statistics Regulation (OSR)

We provide independent regulation of all official statistics produced in the UK. Statistics are an essential public asset. We aim to enhance public confidence in the Trustworthiness, Quality and Value of statistics produced by government. We do this by setting the standards they must meet in the Code of Practice for Statistics. We ensure that producers of government statistics uphold these standards by conducting assessments against the Code. Those which meet the standards are given Accredited Official Statistics status (Accredited Official Statistics are called National Statistics in the Statistics and Registration Service Act 2007). We also report publicly on system-wide issues and on the way that statistics are being used, celebrating when the standards are upheld and challenging publicly when they are not.

Acknowledgements

We would like to thank and acknowledge the input from all the individuals and organisations that we spoke to during researching this work. Organisations and teams that contributed are listed in Annex A.

Enablers of analytical leadership

The following sections present a range of case studies, gathered by OSR, against **six enablers of analytical leadership**. They show how these cross-cutting enablers are important in driving a mature, evidence-driven culture that supports confidence in both analytical evidence and the decisions based on that evidence.

The case studies highlight the important roles of various players in enabling a stronger, data-driven culture within their organisations, including senior analytical and non-analyst leaders, as well as policy, operational and communications colleagues.

By combining the **six enablers of analytical leadership** with a commitment to ensuring **Trustworthiness**, **Quality** and **Value** in evidence – a **'Think TQV'** approach – everyone in government can demonstrate analytical leadership when working with data, analysis or statistics used as evidence. Through this, everyone can contribute to the UK Government's Declaration on Government Reform commitments to put data more fully at the heart of decision-making.

1. Foster an evidence-driven culture (Think T, Q & V)

Fostering an evidence-driven culture supports effective policy-making and sound operational decisions that can, in turn, improve the lives of citizens. An evidence-based approach helps people to make well-informed decisions about policies, programmes and projects by putting the best available evidence from research at the heart of policy development and implementation. Publishing more of the analytical evidence that government produces, in a transparent and accessible way, supports accountability, evaluation and improved outcomes. It can also build public confidence in an organisation's commitment to evidence-based decision-making and the appropriate use of data more generally.

Fostering an evidence-driven culture is only possible through first recognising the value **(Value)** that sound analytical evidence offers, for example, to determine how to operationally work smarter rather than harder; to understand which policy interventions work and those which do not; or to support society's needs for information. Being able to draw conclusions from analytical evidence with confidence requires the evidence to be based on suitable data and methods **(Quality)** and be produced and used in professional and orderly manner **(Trustworthiness).**

Our conversations brought to light four important aspects of **fostering an evidence-driven culture**. These include the need to:

1. Facilitate evidence-based policy and decisions;
2. Have non-analysts create demand for analytical evidence;
3. Have visible analytical leaders at the highest levels;
4. Champion outstanding analytical work.

Facilitate evidence-based policy and decisions

Extract from Declaration on Government reform

"We will put data at the heart of our decision-making, learning explicitly from the approach we have taken in responding to COVID-19."

Advocating for evidence-based policy and decisions, and leading by example in doing so, helps others to see their benefits, as well as how they can effectively use evidence in their own contexts. Analysts and non-analysts both have important roles and responsibilities **(T)** in supporting a strong, evidence-driven culture and making evidence publicly available to support society's information needs and public accountability **(V)**, wherever possible.

Case Study 1A: Establishing an expert analytical committee

The Scientific Advisory Group for Emergencies (SAGE) provides scientific and technical advice to support government decision makers during emergencies. SAGE was most recently convened in January 2020 to provide expert advice on a novel coronavirus, now known as SARS-CoV-2. SAGE is made up of experts from a broad range of disciplines from both inside and outside government, including academics, chief scientific advisers, and members of scientific advisory groups across departments. It advised the government on a wide range of science topics related to the pandemic response, ensuring that authoritative analytical evidence was available to the government, to inform new policies and interventions in a timely manner.

The Government Chief Scientific Adviser made a commitment to publish all scientific advice provided by SAGE. This evidence is in the form of scientific papers and the minutes of SAGE meetings, which means that the public are also informed about the evidence that SAGE's advice to government is based on.

Case Study 1B: Using data for accountability and improvement

The vision for the Office for Local Government (Oflog) is to provide authoritative and accessible data and analysis about the performance of local government, to support its improvement. Oflog aims to become a centre of expertise in the use of data in managing local government and to increase understanding - among citizens, civil society, central government and local government itself - about data on the performance of local authorities.

Oflog's Local Authority Data Explorer allows users to compare key metrics relating to local government performance for authorities with similar responsibilities and attributes, drawing on the Nearest Neighbours Model developed by the Chartered Institute of Public Finance and Accountancy (CIPFA). To support confidence among users and the wider public, Oflog voluntarily applies OSR's Trustworthiness, Quality and Value (TQV) framework for the Local Authority Data Explorer, and states that the transparency of high-quality analytical outputs to inform decision making and the public, underpins its production and release.

Extract from Declaration on Government reform:

"We must do better at evaluating the success of our programmes – not just in terms of meeting budgets but meeting the needs of those we serve. An Evaluation Task Force to act as an inhouse scrutineer not just of value for money in programmes but effectiveness against published ambitions."

Case Study 1C: Evaluating what works to improve outcomes

The Evaluation Task Force is a joint Cabinet Office-HM Treasury unit providing specialist support to ensure that robust evidence on the effectiveness of policies and programmes sits at the heart of government spending decisions. Its goal is to increase the effectiveness and efficiency of Government decision-making, and to improve confidence that the decisions made by policymakers, and the money that Government spends, is improving people's lives.

The ETF delivers a range of activities to tackle barriers to robust evaluation in government and to foster a culture of evaluation. By 2025, the ETF aims to: ensure that all new major programmes in government have robust evaluation in place; all departments publish findings on policy evaluations in a timely and transparent way; stop the replication of programmes that have been shown not to work and learn best practice from those that do; and make the UK Government a world leader in evidence-based policy making.

Since its establishment in April 2021, the ETF has advised on evaluation methods for 305 government programmes worth a total value of £139 billion, it's overseeing the £15m Evaluation Accelerator Fund, the £37.5m Labour Market Evaluation and Pilots Fund and the development of an Evaluation Registry to centrally store all government evaluations with aims to increase cross-government data sharing and increase government transparency and accountability. It is also running the train the trainer Evaluation Academy and publishing an updated 5 year What Works Strategy aiming to improve the way government uses What Works evidence to inform decisions about public services.

Case Study 1D: Taking a strategic approach to evidence use

The Department for Transport (DfT) has been identified as one of the strongest departments in in Government for in terms of its analysis function over the last few years (based on feedback from the Senior Civil Service functional standards survey along with assessment against the analytical functional standard). Its strong evidence driven culture is supported by the strength of expertise across the analytical community and its structure, with most analysts working in teams embedded in policy directorates, plus a central team to maintain standards and deliver cross-cutting strategic work. This structure has supported close working between policy and analysts, and DfT are building on this, empowering policy customers to be more engaged and intelligent customers and users of analysis through structured learning and development for non-analysts to increase their awareness of analytical approaches and capabilities to use data.

DfT's Permanent Secretary played an important role through their vocal passion for, and commitment to, policy and performance evaluation. This helped to embed a strong evaluation culture, driving expectation for evidence use through all levels of the department, so that analytical evidence for evaluation became seen as a core workstream, rather than as a separate entity.

Non-analysts create demand for analytical evidence

A strong evidence-driven culture needs non-analysts at all levels to actively seek out analysis to inform new policy areas and key operational decisions **(V)** as part of a standard, professional way of working **(T)**. Very senior leaders have an important role here: people we spoke to told us that ministers and permanent secretaries can set the tone regarding the department's approach to analysis. If for every new initiative they ask: "how is it going to be measured?" **(Q)** or "what are our plans for publishing our findings?" **(T)** it becomes the norm to integrate data into all policy and decision-making. In this way, they can make a significant difference in driving demand for analysis in decision-making and set the right tone for evidence use throughout their departments.

Case Study 1E: Ministers driving the use of data as evidence

In his 2020 Ditchley lecture, the Rt Hon Michael Gove stated: "it is imperative that we learn the hugely valuable lessons that lie buried in our data". He committed to ensure government has the skills to make better use of data. He also stated that "Government needs to evaluate data more rigorously" and that "Government must also ask itself if its people have the skills necessary for the challenges that I have set out".

Then, in his 2021 launch of the Declaration on Government Reform speech, Michael Gove outlined some benefits and responsibilities associated with using government data: "Government data, effectively used, thus becomes a liberator of individuals. It enables us to arrive at conclusions drawn from evidence about what works to improve peoples' lives. It lets us compare interventions between areas. And it gives students and their families the ability to hold government to account. Handling data requires government, of course, to protect privacy and safeguard individuals' rights. But data can be anonymised, ensuring that government departments observe the right protocols and are transparent in their working."

Case Study 1F: Non-analyst evidence champions

The Director General at the Department for Business & Trade (DBT) has been a champion for analysis, monitoring and evaluation in the department. By bringing their experience of working in other areas of government with a strong analytical focus, they have worked to ensure that evidence is now part of the rhythm of what DBT ministers see.

Key factors in achieving this have been: getting ministers used to using analytical evidence, demystifying it, and; showing the power of evidence, by drawing on departmental ambassadors of impactful analytical projects to communicate specific examples of evidence in practice. While there may be some variation in the extent to which a given Minister or Permanent Secretary may naturally recognise the value of analytical evidence, taking such an approach to highlight its power and benefits in specific cases, has been instrumental in building support and demand and informing policy development.

Visible analytical leaders at the highest levels

A strong evidence-driven culture also ensures that analysts have a seat at the right tables and have channels **(T)** to advocate their professional advice within government and to the public. Representation of analysis at senior levels and in key, influential, decision-making conversations helps to embed expectations and demand for evidence and build a culture of evidence-based decision-making. Analysts should also be visible and have public channels to communicate clear, impartial insights **(V)** both within government and to the public.

Case Study 1G: Visible analytical leaders during COVID-19

Sir Patrick Vallance as Chief Scientific Officer and Professor Sir Ian Diamond as National Statistician, were visible champions for analytical evidence during the COVID-19 pandemic. Their public profile helped to normalise the role of analysis in government decision making, especially through their attendance at the televised Downing Street briefings with the Prime Minister and other senior Ministers.

This provided powerful visibility of senior government analysts standing alongside senior government ministers. It was clear through the format of briefings that their role was to provide trusted, professional, objective analytical advice based on the best available evidence. This was in turn used to inform both the public and the decisions taken by Government based on that advice.

Case Study 1H: Authoritative analytical communications

The Chief Statistician's blog is a regular platform for the Chief Statistician of Wales to speak out on statistical matters. The Chief Statistician uses this channel to champion the work of Welsh statisticians, provide clarity on planned developments, and provide guidance on the correct interpretation of a range of Welsh government statistics. This open communication approach keeps users and the wider public informed on the latest statistical developments.

In January 2022, the Chief Statistician set out the potential impact that the policy change to no longer require people to take a PCR test after initially testing positive for COVID-19 could have on published COVID-19 case data. They explained the changes and provided authoritative advice on interpreting data. This included, for example, informing the public that while the published data on COVID-19 cases may appear to show a fall in cases in the short-term, this may not actually be the case. This provided a clear, authoritative, public, analytical voice on a matter of keen public interest.

Champion outstanding analytical work

Everyone in government has a role in advocating for, promoting and championing strong analytical insights that can help answer key public and policy questions and improve the lives of citizens **(V)**. As well as sharing the benefits of these insights as knowledge across government and publishing them to inform wider society, demonstrating the value of analytical work supports the case for resourcing future analytical projects **(T)**.

Case Study 1I: Recognising analysis with impact

The Analysis Function Analysis in Government Awards (AiG Awards) recognise and celebrate excellent analytical work across government, by members of the Analysis Function, who include colleagues who work within government departments, government agencies and arm's length bodies. There are six separate award categories:

1. **Collaboration**
2. **Communication**
3. **Impact**
4. **Inclusion**
5. **Innovative Methods**
6. **Professor Sir Ian Diamond Rising Star Award**

Contributions by colleagues outside of the Analysis Function are recognised through the Collaboration Award, which celebrates a person or team who has collaborated between teams, departments, other professions, external organisations or researchers to produce an impactful piece of analysis or analytical project.

2. Demonstrate transparency and integrity (Think T & V)

Demonstrating transparency and analytical integrity builds public trust and confidence in how analytical evidence is produced and used across government, and crucially, in the policies and wider decisions that are based on that evidence. Analytical leadership is therefore supported when everyone recognises the value of robust analytical evidence and works professionally and effectively to communicate its insights effectively and uphold its integrity.

To demonstrate this means viewing government analysis as an essential government asset, and a public asset when published **(V)**; being transparent **(T)** about what and how analytical evidence is used **(V)** in policy-making and other government decisions; publishing analytical evidence used to inform policy decisions to support public accountability and evaluation whenever possible, and every time government analysis is used or quoted publicly; communicating analysis effectively; and demonstrating integrity by challenging the misuse or misinterpretation of analytical evidence where necessary **(T)**, including by correcting the public record.

Our conversations uncovered three important aspects in relation to **demonstrating transparency and integrity**. These include the need to:

1. Be transparent about the evidence used;
2. Lead through the effective communication of evidence;
3. Challenge evidence misrepresentation and misuse.

Be transparent about the evidence used

Extract from Declaration on Government reform:

"We must do better at making our data available to all so that we can be more effectively held to account."

Data transparency and integrity should be considered throughout the policy life cycle, with analytical work feeding into policy in a transparent way and clear separation between impartial analytical insights and policy decisions, political positions and communications **(T)**. Publishing clear, impartial insights **(V)** on what analyses do or do not show, in meaningful ways for different audiences, helps support user understanding, appropriate interpretation and use of the evidence.

Government should publish its analytical evidence to support public accountability wherever possible, and every time analysis is used or quoted publicly. OSR's guidance on Intelligent Transparency highlights principles that all those working in government should seek to follow, as a minimum, in order to maintain public confidence when analytical evidence that informs government decisions is publicly quoted or used. **Intelligent Transparency** is supported by three principles:

1. Ensure equality of access – Data used by government in the public domain should be made available to everyone in an accessible and timely way.

2. Enhance understanding – Sources for figures should be cited and appropriate explanations of context, including strengths and limitations, should be communicated clearly alongside figures.

3. Enable independent decision-making and leadership – Decisions about the publication of statistics and data, such as content and timing, should be independent of political and policy influences, to support public confidence in the evidence base.

Case Study 2A: Framework for research conduct and governance

The Government Office for Science has published Guidance to implement the Concordat to Support Research Integrity within Government. The Concordat is a national framework for good research and its governance. Research integrity means upholding the highest standards in research, including legal, ethical and professional standards; and the right environment and processes to support this.

The Guidance requires government to be as open and transparent as possible with publicly funded research, which should be free to access, wherever possible, released promptly and in a way that promotes public trust. Government departments are required to publish annual statements setting out how they met the requirements of the Guidance. Departmental Chief Scientific Advisers, Directors of Analysis and Analysis Heads of Profession have a role in implementing the Concordat for research conducted or commissioned by their departments. Applying the Concordat will lead to better quality research, knowledge growth and a stronger evidence base to support decision-making and to serve the wider public good.

Case Study 2B: An orderly process for publishing research

The Welsh Government has strict protocols for the pre-announcement and publication its research and an orderly research publication culture. The protocols are based on five principles that Welsh Ministers sign up to:

1. New policies or programmes consider the need of evaluation from the outset;
2. Internal evidence planning focuses on providing the evidence to support the Government's strategic priorities;
3. Research is published according to the Government Social Research publication protocol;
4. Ministers are briefed on proposed responses to the recommendations for every evaluation;
5. Explicit value for money analysis is included in evaluations where possible.

These approaches help support integrity, transparency and public confidence in Welsh Government research.

Lead through the effective communication of evidence

Extract from Declaration on Government reform:

"We will make data visualisation a common tool to ensure Ministers and officials understand in real time the latest evidence underpinning decisions. We will ensure Ministers receive training in how to assess evidence, monitor delivery, and work effectively with Civil Service colleagues."

For analysis to effectively inform policy and decision-making, it is essential that analysts are capable **(T)** of communicating the key messages of their work, as well as relevant limitations, caveats and uncertainty, to non-analysts. Understanding the needs of the audience **(V)** is crucial to support the clear and accurate communication of key messages, as well as essential information on limitations and uncertainty.

Case Study 2C: Making analytical communications visual

The ONS Data Science Campus takes applications from public sector employees for its Data Science and Visualisation Accelerator programmes. The Accelerator is a skills-building mentoring programme that gives analysts from across the public sector the opportunity to develop their data science or data visualisation skills.

As well as being matched with a mentor, the 12-week programme gives participants access to the ONS Learning Hub, enabling them to complete courses that support their work on data science and data visualisation projects they choose themselves, and to learn new skills, embed these within their organisations and connect with peers. Since 2015, the programme has supported more than 400 public sector analysts from over 100 organisations to build data science skills through a wide range of projects.

Case Study 2D: Analytical communications to inform the public

The Demographic and Vital Events Statistics team at the National Records of Scotland (NRS) worked on the production of a two-part BBC Scotland documentary called "Who lives in Scotland?".

The team worked with television producers for six months to refine the tone and ensure the accuracy of the broadcast, which highlighted the importance of analysis in informing decisions related to everyday life. They identified the most important stories on the subject, the statistics that underpin them, and the best ways to present and explain them to a general audience. They also worked with visualisation experts to ensure all visuals were accessible to everyone and complemented the narrative. Perhaps most significantly, NRS statisticians were filmed as experts for the documentary, talking about their data and what it shows.

The documentary was very successful and helped develop stronger links with the media and trust in analysis. The programme was aired during Prime Time on BBC Scotland and was the most-watched show at 9pm on 24 October 2022.

Case Study 2E: Communicating complexity effectively to users

Scottish Fiscal Commission (SFC) analysts make complex concepts easy to understand by the public, the Scottish Parliament, and other stakeholders. The SFC considers different users when communicating its forecasts and tailors its outputs accordingly. Although a lot of the SFC's work is complex and technical, analysts go to extra effort to present the information in clear and accessible ways using graphs, infographics, videos, and visual guides targeted at members of the Scottish Parliament and the general public. It publishes explainers on different topics and its longer forecast reports have accessible upfront summaries. The Scottish Parliament's Finance and Administration Committee has expressed positive comments about the SFC's topic explainers.

The SFC is open and transparent about the methods and assumptions used in its forecasts, for example it regularly publishes occasional papers with an accessible introduction targeted at non-expert users and a technical section for expert users. The SFC also makes its data available to all types of users, which is well received.

Each of its main publications is accompanied by a media release where the SFC provides the key points from the publication and delivers a media presentation direct to journalists to ensure their appropriate interpretation. This means that its analysis is generally accurately reported in the media. As well as through a strong media profile, the SFC also supports wider public understanding by directly engaging with stakeholders through webinars and social media activity.

Challenge evidence misrepresentation and misuse

Demonstrating analytical leadership means that everyone works to uphold the integrity of analytical evidence and, at all levels of an organisation, stand up for the accurate use and representation **(V)** of evidence.

Case Study 2F: Trusted impartial analytical sources

The Scottish Parliament's Independent Information Centre (SPICe) provides impartial, factual information and analysis to Members in support of Scottish Parliament parliamentary business. SPICe published a blog on 29 July 2022, which brought clarity to claims made by Scottish Government that it had allocated £3 billion in 2022/23 to help with the cost-of-living crisis. While the press release listed the contributing policies, it lacked clarity on how those policies were selected for inclusion and how much of the funding was newly allocated in 2022/23.

SPICe's blog set out a clear timeline of when the contributing policies were implemented. The timeline highlighted that some of the policies included in the announcement predated the cost-of-living crisis and that the level of new funding allocated in the 2022/23 financial year would be closer to £490 million. Taking a transparent and clear approach supports public confidence in analysis and the organisations that produce them, and minimises the risk of misinterpretation.

Ensuring the accurate use and representation of evidence requires involving the right professionals **(T)** in the preparation of data communications to prevent misuse in the first place but also challenging **(T)** and calling out misuse or misinterpretation and correcting inaccuracies in the public record, where necessary.

Case Study 2G: Challenge misinformation using communications

The **PROVE** framework by the Government Communication Service is part of the RESIST 2 Counter-disinformation toolkit. It has been developed and tested by researchers to ensure effective evidence-based communications.

PROVE can be used to develop clear, informative messaging using scientific evidence to explain nuance and uncertainty around complex issues.

PROVE stands for:

- **Pre-bunk:** anticipate mis- and disinformation through media monitoring and risk assessment and prepare to pre-emptively warn the public
- **Reliably Inform:** trust is built by informing openly rather than persuading. This means ensuring that information reflects expertise, honesty, and good intentions.
- **Offer balance:** do not skew or ignore evidence, but rather ensure balance in how evidence is presented
- **Verify quality:** be open about the quality of the underlying evidence so that the credibility of the information is clear
- **Explain uncertainty:** disclose any uncertainties, gaps and risks with the current evidence.

PROVE is not supposed to advocate or persuade audiences, only inform them. It aims to 'inoculate' people against potential mis- and disinformation. Inoculation helps to strengthen resilience by informing the public about an issue at risk of false or misleading information, preparing them, and improving their ability to engage with the content.

Experiments have shown that audiences find PROVE content more engaging, more trustworthy, and more interesting, than other content.

Case Study 2H: Correcting the public record

All Members of Parliament should soon be able to transparently correct the official public record if they make a statement with an inadvertent error in the House of Commons. This procedure, which does not apply only to confirming the correct interpretation of analytical evidence, is currently only available to Ministers.

Full Fact led a campaign calling for the change. It found that the previous mechanisms for non-Ministerial MPs to correct the record were "not fit for purpose". There was a lack of a formal mechanism for members of the official opposition and backbench MPs to correct the record, and there was no clear way to identify and link an original misstatement to a correction on Hansard. The House of Commons Procedure Committee held an inquiry into the issue, releasing its recommendations in June 2023. The recommendations were designed to improve the clarity and transparency of corrections, and are:

1. Extending the corrections process to all MPs;
2. Improving the visibility of how MP corrections appear on Hansard;
3. Creating a new page for people to find corrections on Parliament's website.

Following a vote by MPs to accept the recommendations, they are expected to be implemented from April 2024.

3. Collaborate across organisations to add value (Think T, Q & V)

Extract from Declaration on Government reform:

"We will bolster dialogue between leaders from all sectors to make sure we are spotting and tackling problems together, and explore new forms of collaboration in service delivery"

Collaboration can occur at all different levels among individuals, teams and organisations working within and outside of government. It can enable more efficient and effective policy and decision-making, facilitate ground-breaking insights and support innovation.

In the context of analytical leadership, the multidimensional nature of many of today's complex problems means that they now rarely fall neatly within fixed departmental boundaries. Working together across professional and organisational boundaries therefore helps government to both identify the key analytical questions **(V)** that really matter for policy and for citizens and bring the available data and evidence together to help answer them. Bringing the insights and professional capabilities **(T)** of multiple professions together on a common question helps to ensure that key decisions made on these topics are based on a sound **(Q)** analytical evidence base.

Our conversation brought up two important actions relating to **collaborating across organisations to add value**. This includes the need to:

1. Triangulate expertise from multiple professions;
2. Add value with external expertise.

Triangulate expertise from multiple professions

Everyone in government is responsible for making sure they achieve good outcomes for citizens by collaborating beyond individual professional or organisational silos. This can be essential for understanding both the 'need' in terms of the question or issue to be addressed **(V)** and also the options for addressing it, in terms of the evidence or professional expertise **(T)** that might be drawn on.

When bringing evidence together to answer identified questions, it is essential to understand when one form of analysis is more appropriate to use than another and how they may complement or triangulate with each other. Each profession will champion its own work, but government needs to be able to understand the relative strengths of each approach or data source **(Q)** and when to use each of the various types of analysis for every question **(V)** to be answered. Collaboration also presents opportunities for cross-profession learning **(T)**, which can enhance wider skillsets and drive innovation **(V)**.

Case Study 3A: Joint working in response to a crisis

Carried out in collaboration with the Department for Levelling Up, Housing and Communities (DLUHC) and the Home Office, the ONS Humanitarian Response Insight Survey was compiled rapidly to inform the UK's response to the Russian invasion of Ukraine, the subsequent evacuation of individuals fleeing Ukraine, and to aid local and national emergency response planning. It set out to understand the experiences and intentions of those arriving in the UK under both the Ukraine Family Scheme and the Ukraine Sponsorship Scheme (Homes for Ukraine).

ONS and DLUHC subsequently launched the Homes for Ukraine Sponsor Survey to understand the experiences and intentions of UK households registered as sponsors with the Ukraine Sponsorship Scheme. The effective collaboration between analysts and policy officials in ONS, DLUHC and the Home Office led to new, valuable analytical evidence on the experiences of Ukrainian refugees and their scheme sponsors. This has helped local authorities, government, charities and other organisations, to plan support for this population and their sponsors, as well as increase public awareness of the issues they face.

Case Study 3B: Cross-profession working in action

Public Health Scotland (PHS) drew together different expert perspectives and data to help answer important public health questions during the COVID-19 pandemic. As a new public health body made up of multiple professions, there was a clear need for effective collaboration to ensure the most relevant health related information was available to inform government decisions, and published to inform the public.

PHS statisticians worked closely with data managers, epidemiologists, academia, policy, communications and Scottish Government officials as part of this process. The PHS Head of Statistics Profession played a highly influential role, co-leading a cross PHS/SG COVID data and intelligence forum, which had oversight of, and set direction for, development in COVID data developments and reporting. This allowed them to see potential crossovers in planned outputs and encourage collaboration, and ensure a common understanding of the value of PHS statistics and data and the standards they should be produced to. Building strong relationships with policy colleagues was key to developing their understanding of what the emerging data showed, while working with the communications team helped to build relationships with journalists to support accurate reporting in the media.

Further benefits of this collaborative approach were realised when changes to the measurement of COVID-19 infections were made, as PHS staff were able to provide clear insights around the interpretation of the changes. Overall, PHS's effective approach to cross-profession collaboration during the pandemic resulted in valuable, high-quality, coherent data and statistics that proved essential for informing both government decisions and the public, and this approach to collaborative working continues to today in all other aspects of PHS's work.

Case Study 3C: Collaborating to answer important questions

ONS worked collaboratively with analysts in the Department of Health and Social Care and Department for Work and Pensions, to produce new experimental insights on people receiving social security benefits by health conditions and sociodemographic characteristics.

The analysis required the linking of Census, primary care and welfare benefits data sources held in different government departments, to provide important new evidence into how the COVID-19 pandemic impacted people's health, their ability to work, and the social security benefits that they received. For example, the analysis provided evidence that deprivation and ethnic differences in benefit recipients that existed before the start of the pandemic, became wider during it.

The analysis was funded by HM Treasury's Shared Outcomes Fund, which was established in 2019 to incentivise government departments to work collaboratively across challenging policy areas to strengthen joint working, improve outcomes and deliver better value for citizens.

Add value with external expertise

Extract from Declaration on Government reform:

"We will operate more seamlessly with institutions outside government, building partnerships with the wider public sector, private sector and community organisations to secure the best outcomes for citizens."

There should be clarity about the value government analysis adds, but also recognition of where and when drawing on external professional expertise **(T)** can add significant value, especially where collaborating might offer benefits such as innovative insights **(V)** and methods, or provide external assurance **(Q)**.

Case Study 3D: Working with academic research specialists

The Ulster University Economic Policy Centre is an independent economic research centre which aims to produce evidence-based research to inform policy development and implementation. The centre undertakes independent economic research for various government departments in Northern Ireland to help inform decision making in the Northern Ireland Executive, and also for various councils at the local government level, providing a partnership between academia, business and government.

The centre carries out external independent analysis of key economic data and publishes its own reports, analysis and visualisations, on topics such as enterprise and business demography and labour market intelligence. It is also helping to develop the next generation of economic policy makers through its taught courses at the Ulster University Business School.

Case Study 3E: UK-wide collaborative analytical networks

Administrative Data Research UK (ADR UK) is a UK-wide partnership which aims to transform the way researchers access the UK's wealth of public sector data, to enable better informed policy decisions that improve people's lives.

ADR UK engages with UK and devolved governments to create linked (or linkable) research data assets, and facilitates safe and secure access to the datasets for accredited researchers to answer pressing policy questions. ADR UK is made up of four national partnerships (ADR England, ADR Northern Ireland, ADR Scotland and ADR Wales) and the ONS.

The ADR UK model for working with data owners and researchers is all about bringing government and academic groups together into collaborative partnerships. The aim is to deliver policy-relevant research that reinforces the feedback loop between those who have collaborated to open up access to data and the accredited researchers commissioned to analyse it.

For example, a Welsh Government lead told us that ADR Wales coordinates analytical input from Swansea University, Cardiff University and Welsh Government to address priority questions identified in the Welsh Government's Programme for Government. This includes work on early years, education, housing, social care, social justice, mental health, health and wellbeing, climate change, skills and employment and major societal challenges.

Case Study 3F: Collaborating on government research priorities

Published government statements on Areas of Research Interest (ARI) provide a transparent and structured way to publicise details about the main research questions facing government departments, and facilitate collaboration to help answer them.

ARI's encourage collaboration by acting as a platform for engagement with academia, external experts, research councils, industry, and many other organisations across the research and development landscape, as well as between government departments themselves. ARI topics and questions help to clarify government research interests to expert communities, which facilitates the identification and uptake of high-quality research and innovation to deliver evidence-informed practice and policy. ARI's are particularly useful on topics where departments are not resourced or do not have the required expertise to answer research questions themselves, or do not know what research already exists.

The Government Office for Science coordinates and collates ARI's for UK Government departments and agencies, whereas separate information is published by Senedd Cymru on its research priorities. The ARI Database is the A to Z of all department ARI questions and, where applicable, can highlight relevant research funding published on the UKRI Gateway to Research platform.

Case Study 3G: Drawing on external professional networks

The Department for Transport (DfT) has good working relationships with external research companies such as Ipsos Mori and Kantar. When the COVID-19 pandemic began they worked together on innovative approaches to data collection rather than duplicating effort.

The organisations shared ideas and data, which led to innovations in data collection in challenging circumstances. This illustrates the benefits that collaborative professional networks and partnerships between government and commercial sector organisations can lead to, such as mutual advances in knowledge and expertise based on partnership working, rather than relationships being exclusively based on specific contractual exchanges.

4. Embed structures to support evidence (Think T & Q)

Extract from Declaration on Government reform:

"We will not allow hierarchy to impede rapid problem-solving or effective delivery, and ensure we have the right structures in place to deliver the outcomes we want as efficiently as possible".

How organisations are structured, in terms of delivery and governance, is key to enabling analytical leadership. It is important that departmental governance structures **(T)** have an analytical aspect built into them to embed the expectation and demand for evidence across an organisation and support a culture of decision-making based on sound evidence **(Q)**. Analytical leadership is particularly helped when established governance structures enable analytical professions contribute to policy and decision-making at senior levels. Effective structures are also required to facilitate the orderly publication of evidence **(T)** for public information needs.

Through our conversations we heard of two important aspects in **embedding structures to support evidence**. This includes the need to:

1. Integrate evidence into policy and decision-making;
2. Establish structures that support cross-profession collaboration.

Integrate evidence into policy and decision-making

Decisions about where analytical teams sit and how their work feeds into policy and decisions **(T)** are crucial, as they impact expectations for the need for new evidence; information flows between different professions; and whether the right analytical evidence **(Q)** is available to inform decision makers at the right levels, when needed.

Case Study 4A: Governance to support strategic evidence

Building on successful collaboration experienced during the pandemic, the Welsh Government has established a Strategic Evidence Board to consider strategic issues around evidence capability, planning and structures. This includes considering areas of work where a joined-up approach to analytical (and scientific) evidence could be useful. The board intends to identify the highest priority evidence needs and works collectively to consider how they can be met, recognising the need for joined up analytical relationships across policy too. The Board assesses evidence needs against the Welsh Government's Programme for Government and other commitments, to ensure activity is effective and delivering value for money.

As the Board is chaired by the Chief Operating Officer, the board is putting analysis at the top of Welsh Government. Having a Director General as the chair means that Board will also feed into the Executive Committee, thus ensuring the best analytical evidence flows up to the very top of the organisation.

Case Study 4B: Operationalising analytical insights

The Scottish Courts and Tribunal Service carried out analytical work on jury trial backlogs caused by the COVID-19 pandemic. An analyst modelled recovery scenarios to illustrate how courts might recover most effectively from the pandemic, which played a key part in securing some £12m of recovery funding. This funded the use of cinemas to host socially distanced juries, enabling jury trials to safely recommence in 2020, with some 2,500 jury trials conducted using this approach over 18 months.

This came about because a SCTS statistician who was on secondment from Scottish Government was embedded alongside the SCTS operational team and COVID response team. They were engaged in operational issues and decisions from the start and well placed to use their trusted analytical skills to provide quality analysis that facilitated a positive solution. Regular liaison with justice partners was required to make the scheme a success – and the ability to demonstrate the impact it would have, was critical. This meant that, after the pandemic, Scotland did not have the same jury trial backlog as was experienced in England and Wales.

Structures that support cross-profession collaboration

The previous section showed how collaborating beyond individual professional and organisational silos leads to innovative approaches and new insights that can achieve good outcomes for citizens. However, collaboration is facilitated when departments establish structures **(T)** that support different professionals to work effectively together and combine the most suitable analytical evidence and techniques **(Q)** to answer key questions and support effective decisions.

Case Study 4C: Cross-profession leadership structures

Scottish Government's Analytical Leadership Group (ALG) is comprised of senior analytical leads from across the range of its service and policy directorates, incorporating professional economic, statistical, social and operational research expertise. The group provides direction for analytical priorities and advises Directors on these where relevant.

The ALG was instrumental in establishing the COVID-19 data and intelligence network during the COVID-19 pandemic, which helped to foster collaboration between the Scottish Government, public bodies, and academics. This led to the development of the cross-analytical Scottish Government COVID-19 Four Harms Dashboard which brought together data and evidence on the social, economic, direct and indirect health impacts of the pandemic. The analyses provided a compliment to the established health data series and were used during weekly COVID-19 strategy meetings and to inform decisions related to the pandemic and Scottish Government's measures taken in response to it, for example, in relation to its approach to business support schemes and decisions around lifting lockdowns.

Case Study 4D: Using seminars to establish evidence needs

The Department for Transport's (DfT) actionable 'Think People' seminars were established to connect people at DfT with academics and experience in the fields of transport and human behaviour.

The seminars provide opportunities for DfT staff across all functions to better understand how people use transport and understand the role that these insights can play in informing policy design. They highlight the importance of understanding the evidence base for policy ideas on a given topic, and ensuring the evidence exists to assess the effectiveness of new policies once introduced.

Case Study 4E: Combining the best approaches and advice

The Department for Environment Food and Rural Affairs (DEFRA)'s cross-analytical unit is jointly headed by a senior economist and senior social researcher. The unit provides advice to analysts in the department on analytical standards, specialist skills such as evaluation, business case writing, behavioural insight and operational research, and provides assurance functions such as signing off regulatory impact assessments.

The joint cross-profession headship promotes a multi-disciplinary approach to problem solving and collaboration on cross-cutting topics and issues, which also seeks to bring in scientific evidence.

5. Invest in analytical capacity and capability (Think T, Q & V)

Extract from Declaration on Government reform:

"We will bolster traditional skills such as drafting written advice, understanding statistical concepts, and appreciating how Parliament works, as well as developing expertise in areas including digital, data, science, and project and commercial delivery."

Strong analytical skills are increasingly seen as a significant organisational asset, and analytical awareness is becoming essential for a range of government roles.

Maximising opportunities for cross-profession learning can help enhance the skillsets **(T)** of everyone in government. This ensures that government is suitably skilled and resourced to answer the most pressing questions of today, and those of tomorrow, and facilitates innovation **(V)** by drawing on the most up-to-date approaches and techniques. Investing in new analytical systems and tools also helps to ensure that analytical conclusions on which decisions are based is sound **(Q)** and that analysts are enabled to respond to the key policy questions of the future **(V)**.

Analysts should also have access to wider analytical networks so that they are supported in their current roles as well as their longer-term careers **(T)**, regardless of whether they work in a large department or a smaller Arm's Length Body (ALB). Affiliation with professional networks is a critical mechanism that supports cross-government learning and access to development opportunities, such as those gained through job rotations, secondments and swaps.

Our conversations further revealed three important actions related to **investing in analytical capacity and capability**. This include the need to:

1. Upskill analytical capability for all;
2. Embrace new tools and skills to meet future evidence demand;
3. Pool resources to improve analytical capability.

Upskill analytical capability for all

Extract from Declaration on Government reform:

"Establish a new curriculum and training campus for government, with a new digital way to access learning, a mandatory induction package, and a data masterclass for the SCS."

Analytical capability is increasingly essential for everyone working in government, not just those in analytical roles. Investment in the skills and infrastructure **(T)**

needed to build analytical capability and resilience is necessary to realise the benefits **(V)** of an evidence-driven culture, both within central government departments and Arm's Length Bodies and local government, which are part of the evidence ecosystem.

Case Study 5A: One Big Thing 2023: Data

The One Big Thing 2023: Data was a learning and development opportunity that aimed to improve the data skills and confidence of all civil servants. Civil servants were asked to complete at least one day (7 hours) of data related training by the end of 2023, tailored to three levels of analytical experience:

- Understanding Data (awareness)
- Working with Data (working)
- Data Masterclass (practitioner)

The objectives of One Big Thing 2023 were to:

- Raise data awareness, confidence, knowledge and understanding;
- Trigger long-term impact on participation in data and other training initiatives;
- Improve outcomes: contribute towards achieving better outcomes in the delivery of public services and policy.

After four months One Big Thing delivered 703,000 hours of data learning to 212,000 people, with over 182,000 core e-learning courses completed.

Case Study 5B: Making statistical leadership 'Fit for the Future'

Scottish Government has established a statistical leadership programme, Fit for the Future, which helps to foster a culture of empowerment and leadership at all levels by empowering all staff to make decisions. The programme has a focus on innovation and continual improvement, advocating a strategic rather than reactive approach in leadership in the production of statistics.

The programme is driving culture change by upskilling statisticians to answer the questions of the future, supporting analysts to focus on work that is of high value to users, and to stop doing what is not.

It is also focused on investing time and resource in get new development initiatives off the ground, like introducing 'reproducibility by default' or using new tools and services that enable the efficient production of statistics, resulting in longer-term quality and efficiency benefits overall.

Case Study 5C: Inspiring senior leaders about data

The ONS Data Science Campus - Data Masterclass is a series of talks, supported by articles and other easily digestible forms of learning, to inspire and enable senior leaders across Government to make the effective use of data and evidence central to their everyday work. The Masterclass is founded on the principle that increasing senior leaders' data-literacy and grasp of empirical methods will help them to serve the country in the most effective way.

The Masterclasses contains compelling 15-minute talks from some of the UK's top statistical experts, complemented by a range of case studies from within Government of exemplary data practice.

The key aims are to engage and inspire senior leaders through memorable stories, which show what is possible, on the following topics:

- **Week 1** – Data-driven policymaking/decision-making
- **Week 2** – Communicating compelling narratives through data
- **Week 3** – Data science and new frontiers

The Masterclass is not designed to make participants data or evidence experts, but rather to strengthen their knowledge of when and how to make the best use of statistical evidence and the right questions to ask of analysts when doing so.

Embrace new tools and skills to meet future evidence demand

Extract from Declaration on Government reform:

"We will champion innovation and harness science, engineering and technology to improve policy and services. We will expect officials to ask 'how can science help' when approaching problems and have the skills to deliver on this"

It is key that analysts stay up to date with innovative technologies **(V)** and have the time to develop new skills **(T)**. With growing recognition of the opportunities afforded by new methods, **(Q)** such as data science, data linkage and the use of artificial intelligence, more investment is needed to ensure government can reap the benefits and safeguard **(T)** against the risks. Senior leaders have an important role to play here, prioritising and championing **(T)** innovation and investment in new methods and tools.

Case Study 5D: Making analysis reproducible by default

Making reproducibility a priority for analysis in government is an essential step towards the digital transformation of analysis. The Analysis Function Reproducible Analytical Pipelines (RAP) Strategy encourages analysts to adopt reproducible approaches by default. RAP based analysis improves quality through automated data validation and testing. Analysis built using RAP principles can be more impactful through interactive data presentation, more timely and less costly by removing manual steps, and more powerful by using advanced analytics. Analytical products should be developed in open-source software, which encourages collaboration and transparency.

Once RAPs are established this frees up time and resources to do more relevant, higher priority analytical work, or to add insight around the analysis. Managers overseeing analysts using RAP processes do not necessarily need to know how to code but need to know enough to empower analysts to use and develop their coding capability and steer RAP projects so they meet user needs and are sustainable.

Extract from Declaration on Government reform:

"We must do better at pooling and sharing data so we can analyse in depth the impact of our policies."

Case Study 5E: Using linked data to assess impact

The Administrative Data Research Unit (ADRU) in the Welsh Government has gone beyond a proof of concept for data linkage and is now able to use linked data in focused ways to provide specific insights in relation to its Programme for Government. Examples where this has influenced decision making include:

1. Linking Flying Start scheme attendance data to education Foundation Phase baseline on-entry assessments – this project established that children who attended more hours of Flying Start childcare did better in all areas of school on-entry Foundation phase baseline assessments. This helped to inform the decision to expand childcare provision in Wales from September 2021.

2. Linking Care & Repair home advice and modification interventions data with care home admissions data – this project indicated that receiving Care & Repair service support helped to prevent care home admissions for moderately and severely frail people, compared to a control group of people who did not. It informed the Welsh Government decision to increase Care & Repair agency funding in Wales, despite budgetary pressures.

3. Linking school workforce census data to COVID-19 vaccination records – this work enabled the Welsh Government to understand the level of vaccination uptake in the Welsh teaching workforce at different points in time during the pandemic, by factors including geography, role, sector, age and ethnicity.

Case Study 5F: Establishing data-driven insights and innovation

Led by the Ministry of Justice (MoJ), the Better Outcomes through Linked Data (BOLD) Programme is a cross-government data-linking exercise which aims to improve the connectedness of government data in England and Wales. BOLD was created to demonstrate how people with complex needs can be better supported, by linking and improving the government data held on them in a safe and secure way. BOLD aims to remove barriers to linking and sharing data across government, to:

- improve understanding of what interventions work;
- help develop more evidence-based policies; and
- help to redesign services to benefit the public.

The BOLD team is multidisciplinary and includes analysts, policy specialists, data engineers, strategists and project specialists from several organisations including: the Department for Health & Social Care; Office for Health Improvement and Disparities; Public Health Wales; Welsh Government; Department for Levelling Up, Housing & Communities and the Ministry of Justice.

BOLD uses innovative data linking software called 'Splink' which was developed by MoJ analysts to link data across organisations. Splink, which is open source, has been downloaded more than 8 million times around the world, and is used in government, academia, and the private sector on datasets up to more than 100 million records. Its speed has opened up the possibility of real-time linking in operational services, and it is now used extensively in the courts and probation space, including to better understand offenders on probation and significantly improve efficiency in probation supervision. MoJ's data linkage team won an Analysis in Government Award, recognising its work to develop Splink as an innovative tool.

Case Study 5G: Sharing data to provide new insights

The Integrated Data Service (IDS) is the first Digital Economy Act accredited, fully cloud native Trusted Research Environment to operate across government. The ONS is the lead delivery partner for the IDS, a central platform which provides access to deidentified, indexed critical government data to accredited analysts from central government, the devolved administrations and the wider UK research community.

The IDS provides the technical and data architecture which enable the wider use of Essential Shared Data Assets across government, utilising the Reference Data Management Framework to ensure the data hosted on the platform can be joined interoperably, delivering an innovative, flexible and scalable approach to data linkage, which will unlock the potential of government data to drive better decision making. The IDS is key to delivering the government's National Data Strategy and the Central Digital & Data Office roadmap for digital and data from 2022-2025.

Pool resources to improve analytical capability

To answer a pressing analytical question **(V)**, the necessary analytical resources and expertise need to be in the right place, at the right time. However, this is not always the case in a sometimes stretched and decentralised analytical system, with mix of larger departments and smaller bodies which are geographically widespread. Effective analytical leadership can therefore require sharing, pooling and redistribution of experience, skills and resources **(T)** beyond established organisational silos to ensure that the required analytical evidence is timely, relevant and robust **(Q)**.

Case Study 5H: Supporting local level decision making

A multidisciplinary team from the Office for National Statistics have been innovating to make local statistics more accessible and usable for local government decision makers. The Explore Subnational Statistics team have published the Subnational indicators explorer, in line with the Government Statistics Service (GSS) subnational data strategy. They have recently launched the Explore local statistics Beta service to help users find, visualise, compare, and download statistics for local areas, and make decisions at a local level.

Data and statistics are most valuable with insight. Therefore, ONS has established ONS Local, an analytical advisory service supporting local government across the English regions and the Devolved Administrations in accessing and making the best use of local data. ONS Local provides analytical support to key local users, including delivering bespoke projects to fill local data gaps. Its work also enhances transparency, and fosters efficient resource allocation, to ultimately benefit communities and strengthen regional collaboration.

For example, ONS Local has helped Yorkshire stakeholders to better understand local business sizes and employment trends, which gave local policymakers enough evidence to make the case for investment in small businesses and drive local employment. ONS Local also helped to inform broadband rollout plans for various councils in the East Midlands and East of England, replicating work carried out previously by the ONS Data Science Campus to create digital exclusion risk factor maps using OFCOM broadband data. Currently ONS Local is helping Greater Manchester Combined Authority to update their ESPRESSO tool. This will provide accurate fiscal insights for local authorities, enabling informed policy decisions and supporting devolution.

A series ONS Local workshops has focused specifically on building local stakeholders' analytical capability, helping them to build their own dashboards using APIs in PowerBI. These have had a lot of success, recently hosting over 600 attendees at each event. Written feedback from attendees describe the events as "brilliant, informative [and] really insightful". ONS local also host weekly "ONS Local Presents…" webinars which ensures that it brings the best quality local intelligence into ONS, so that its statistics continue to remain relevant and deliver value in meeting priority user needs.

6. Draw on analytical standards and expert functions (Think T & Q)

It is important that there are clear standards **(T)** for analysts in government and that analysts have the access to the guidance that they need. Accessing the right guidance requires drawing on advice, expertise and resources, both within departments and beyond. Having clear guidance helps to ensure that analytical approaches, standards and techniques follow professional best practice **(Q)**, wherever possible, and comply with established legal and ethical standards **(T)**. Clear standards also help to ensure efficiency and analytical coherence by drawing on established sources, definitions and approaches to communicating strengths, limitations and uncertainty **(Q)**, rather than reinventing the wheel.

There are varying approaches to governance and the structure of analytical staff in the UK, with each of the Devolved Administrations sometimes taking their own approaches. OSR heard about good work being carried out by different parts of government in this area, including the Government Analysis Function, the Government Statistical Service and the ONS Data Science Campus. Crucially, there are opportunities to build links between different professions around shared values, standards and priorities for analysis, and by drawing on UK expert functions.

Our conversations brought up two important aspects when using the analytical system. This includes the need to:

1. Follow and promote professional standards; and
2. Draw on UK expert functions.

In this section, rather than offer case studies, we have shared information on several key standards and expert groups that can be drawn on. This is not an exhaustive list of the standards and groups that exist across government, but rather ones that have been highlighted in our work.

Follow and promote professional standards

A variety of established professional standards **(T)** set out expectations for undertaking methodologically sound, robust and assured **(Q)** analysis across government.

Case Study 6A: The Analysis Functional Standard

The Analysis Functional Standard sets expectations for the planning and undertaking of analysis across government to support well-informed decision making; to deliver better outcomes, and improve the lives of citizens. It provides direction and guidance for permanent secretaries, directors general and chief executive officers of arm's-length bodies to ensure appropriate governance of analysis, as well users and producers of government analysis including non-analysts and external consultants to ensure quality and consistency of analysis across government organisations.

Case Study 6B: Office for Statistics Regulation TQV framework

The Code of Practice for Statistics from the Office for Statistics Regulation (OSR), sets the standards that producers of official statistics should commit to, to support public confidence in how statistics are produced and used. But the three pillars of the Code – Trustworthiness, Quality and Value – support all types of evidence.

Committing to OSR's TQV framework on a voluntary basis can be done by any producer of data, statistics and analysis, whether inside government or beyond. It helps teams produce analytical outputs that are of high quality, useful for supporting decisions and well respected, supporting public confidence for published analytical outputs. The three pillars focus on:

1. **Trustworthiness**: the organisation's commitments to professionalism, sound governance and separation of statistics and data from policy

2. **Quality:** appropriate data sources and methods, together with a commitment to quality assurance

3. **Value:** clarity and insight as to what the data and statistics can, and cannot, be used for.

Many organisations already voluntarily apply the TQV framework. Among them:

The UK Health Security Agency (UKHSA) voluntarily applied TQV to its Coronavirus (COVID-19) in the UK Dashboard – the official UK government website for data on COVID-19. It did so to show its commitment to transparency and desire to increase user trust in the dashboard, to help it as a producer to demonstrate what it was doing well, and to identify areas for improvement. Applying TQV allowed UKHSA to feel confident that its work was easy to access, remained relevant, and supported understanding of important issues in relation to COVID-19.

The Office for Local Government (Oflog) voluntarily applies TQV to its Local Authority Data Explorer. While the data explorer is not designated as official statistics, Oflog has made a public commitment to uphold TQV, which helps it emphasise that transparency and an ambition to produce high-quality analytical outputs that inform decision making and the public, underpin the explorer's production and release.

The Scottish Fiscal Commission (SFC) sees its voluntary application of TQV as important in building public confidence in its outputs. The SFC uses voluntary application to help demonstrate why its outputs can be trusted. Examples of what the SFC does as part of this commitment include preannouncing publications, which means stakeholders know when to expect outputs, and having a transparent policy to handling corrections and revisions. The SFC also publishes all its data in accessible spreadsheets so they can be easily re-used, and has an active external engagement strategy encompassing the public, the Scottish Government, the Scottish Parliament, and other key decision makers.

Case Study 6C: The Aqua Book

The Aqua Book provides guidance on producing quality analysis for government. It was produced following the 'Review of quality assurance of government analytical models', by a cross-departmental working group on analytical quality assurance.

Case Study 6D: The Magenta Book

The Magenta Book provides guidance on what to consider when designing an evaluation. It looks at the types of evaluation (process, impact and value-for-money) and the main evaluation approaches (theory-based and experimental), as well as setting out the main stages of developing and executing an evaluation.

Case Study 6E: The Green Book

The Green Book provides guidance on how to appraise and evaluate policies, projects and programmes. It also provides guidance on the design and use of monitoring and evaluation before, during and after implementation. Green Book guidance applies to all proposals that concern public spending, taxation, changes to regulations, and changes to the use of existing public assets and resources.

Draw on UK expert functions

The UK has a range of analytical expert and advice functions that support the suitable **(Q)** and responsible **(T)** production of analysis across government. They are open to providing support to anyone in government undertaking analytical work both in terms of collaborative projects and bespoke analytical advice.

Case Study 6F: Centre for Applied Data Ethics

The Centre for Applied Data Ethics was established by the UK Statistics Authority in 2021 to provide practical support and thought leadership in the application of data ethics by the research and statistical community. The Centre aims to provide a world leading resource that addresses the current and emerging needs of user communities, collaborating with partners in the UK and internationally to develop user-friendly, practical guidance, training and advice in the effective use of data for the public good.

The Centre for Applied Data Ethics Independent Advisory Committee (CADEAC) has been established to advise the UK Statistics Authority on the strategic direction, outputs and impact of the Centre. The committee is formed of experts from government and academia. CDEAC have produced an easy-to-use ethics self-assessment framework for researchers to review the ethics of their projects throughout the research cycle. The framework provides a timely means for researchers to identify potential ethical issues within their research proposals and an accurate and consistent estimation of "ethical risks" across research projects.

Case Study 6G: No 10: Evidence House

Led by the 10 Downing Street Data Science team, Evidence House aims to radically upskill civil servants in data science, software development and AI while delivering innovative solutions to crowdsourced problems. It does this by:

- Bringing skilled Civil Servants together, putting them in teams and have them compete to generate new solutions to priority problems through multi-day hackathons.
- Taking the best ideas from the hackathons and developing them further, by deploying members of the community.
- Supplementing this hands-on experience with learning and development opportunities for members, from introductory courses in programming to one off seminars and specialist workshops.

Since being established last year, the programme has amassed 850 members to whom it has delivered 12,500 hours of hands on in person technical upskilling, while through its hackathons numerous projects have been developed further, with some in trial across government currently.

Case Study 6H: ONS Data Science Campus

The ONS Data Science Campus was established in 2017 as a Centre of Excellence with the purpose of applying data science, and building data skills, for the public good across the UK and internationally. The campus seeks to capitalise on a new generation of tools and technologies to exploit the growth and availability of these new data sources and innovative methods to provide rich informed measurement and analyses on the economy, the global environment and wider society.

The goals of the ONS Data Science Campus are to:

- investigate the use of new data sources, including administrative data and big data for public good;
- help build data science capability for the benefit of the UK.

The campus works with experts from various UK and international organisations including academic institutions, commercial and third sector organisations and other National Statistical Institutes. It collaborates on a wide variety of initiatives including, but not limited to, data science, including, capability building research and data sharing.

Case Study 6I: Government Data Quality Framework

The Government Data Quality Framework produced by the Government Data Quality Hub supports a strong data quality culture, through principles and practices to assess, communicate and improve data quality. It sets out five principles which act as a guide to help create a strong data quality culture. The principles are:

1. **Commit to data quality** – Create a sense of accountability for data quality across your team or organisation, and make a commitment to the ongoing assessment, improvement and reporting of data quality.

2. **Know your users and their needs** – By researching and understanding user needs we can ensure data are fit for purpose and prioritise our efforts on the data which are most important.

3. **Assess quality throughout the data lifecycle** – Data quality should be managed across the data lifecycle, paying close attention to quality measures and assurance at each stage.

4. **Communicate data quality clearly and effectively** – It is important to clearly communicate the quality of your data so that users can decide if it meets their needs

5. **Anticipate changes affecting data quality** – Not all future problems can be predicted. Where possible, anticipate and prevent future data quality issues through good communication, effective management of change and addressing quality issues at source.

The principles underpin best practice approaches to data quality and explain procedures and attitudes to help facilitate this.

Case Study 6J: The Regulatory Policy Committee

The Regulatory Policy Committee (RPC) is the independent regulatory scrutiny body for the UK Government. It is an is an advisory non-departmental public body, sponsored by the Department for Business and Trade.

As a centre of excellence, the RPC provides expert advice on the quality of evidence and analysis used to inform government regulatory proposals. This independent advice and scrutiny helps ensure that ministerial policy decisions are based on accurate evidence, and helps to produce better regulation. Through effective early engagement with departments, the RPC plays a key role in improving the evidence used to support ministerial decision making.

The publication of RPC's advice is also of value for parliamentary scrutiny and assists stakeholders in understanding the impact of regulatory proposals.

Annex A

What we did and acknowledgements

We spoke with over 50 people across more than 30 government departments in each of the four UK nations. This included with directors, heads of profession, economists, social researchers, and policy colleagues. We also spoke to several people outside of government, including academics. Our conversations centred on peoples' views about how government analysis is produced, used and valued.

We would like to thank the following organisations that we spoke to during this work:

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Department for Environment, Food and Rural Affairs
Department for Health and Social Care
Department for International Trade
Department for Transport
Department for Work and Pensions
Department for Levelling Up, Housing and Communities
Government Analysis Function
HM Revenue and Customs
Ministry of Justice
National Records of Scotland
Northern Ireland Department for Communities
Northern Ireland Department for Economy
Northern Ireland Department of Education
Northern Ireland Housing Executive
Northern Ireland Statistics and Research Agency
Number 10
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Public Health Scotland
Research Data Scotland
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Scottish Fiscal Commission
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