Evidence: Improving the use of evidence in UK government policymaking

A report by the Campaign for Science and Engineering

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CaSE Campaign for Science and Engineering

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3: Establish robust science advice structures in the Department for Exiting the EU and Department for International Trade.
4: The House of Commons Science and Technology Select Committee should undertake an inquiry to review the uptake of and adherence to government guidelines on 'the use of science and engineering advice in policymaking'.

Supply and Demand

5: The CSA should oversee and publish an annual update of their department's 'areas of research interest'.
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7: The Cabinet Office should oversee the creation of a cross-departmental database of government research.
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10: Departments should establish and publish an evaluation strategy and report annually to their Departmental Board on progress.
11: Robust plans for evaluation should be a requirement for business case approval by government departments and should be published.
12: The remit of Scientific Advisory Councils should be expanded to include independent scrutiny of evaluation.
13: When policies are announced, the underpinning body of evidence should also be published.
14: All independent evaluations should be published within 12 weeks from the date of completion.

Introduction and Summary

Evidence-based policy making (EBPM) is not a new idea. What is new and positive is the increasing attention placed on the use of evidence in policymaking in the UK over the last two decades. CaSE has been a consistent champion for the use of evidence in policymaking. This programme of work provided a fresh opportunity to explore current structures, processes and practice. On that foundation, this report makes recommendations for how structures and processes could be strengthened to improve practice across government.

Since the conception of this project in early 2016, the task facing policymakers has arguably multiplied as the UK Government seeks to responsibly navigate leaving the EU. It is highly likely there will be substantial domestic policy, funding and regulatory flux across government activity in the short and medium term. This increases the importance of ensuring the processes and structures for accessing and using evidence to inform decisions are fit for purpose, performing well and as joined-up as possible across government.

The report and recommendations draw on public literature, stakeholder meetings and in-depth interviews with individuals with experience across the science advice landscape including Chief Scientific Advisers, government officials, representatives from research bodies and the wider science and policy communities.

A few overarching messages came out strongly. Firstly, UK Government's science advice structures and mechanisms are viewed favourably by the international community. That is the starting point for this report. Research also highlighted that there could be significant gains from being more strategically joined-up across government, both in terms of sharing good

practice but also by increasingly working from a shared evidence base. Another recurring theme was the importance of people. In particular, the need for people equipped with the necessary skills and appropriate agency to bring evidence to bear on decisions at every level, from policy development and programme evaluation, to science advice at the highest levels of government.

The report makes 14 recommendations to improve the use of evidence in UK Government policymaking. Chapter one considers the advice architecture, making recommendations on how to strengthen science advice structures and support better join-up and leadership across government. Chapter two looks at the different factors driving healthy supply and demand for evidence. It makes recommendations to remove barriers and create incentives for those on both sides, and to enable the Government to maximise the use of its collective evidence base. Finally, chapter three focuses on improving evaluation and accountability. It recommends a more strategic approach to evaluation, and increased transparency through publishing and robust scrutiny.

CaSE will continue to work with our members, the Government, Parliament and the wider science and engineering community to see these changes put into practice to improve policymaking.

Recommendations

Architecture

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Introducing evidence-based policymaking

Evidence is described by the UK policy profession as 'facts, figures, ideas, analysis and research[1]'. Evidence is useful both in the definition of policies and in evaluating policy choices. Decisions that are made based on rigorous and objective evidence are seen to produce better outcomes[2]. Having good evidence to inform difficult decisions can be politically attractive. It can give credibility and weight to decisions in politically fraught policy areas or help build public support for potentially controversial policies. Also, using evidence to make policy decisions helps ensure transparency at all stages of the process[3]. Although the concept of evidence based policymaking (EBPM) is widely used in politics, conventional

1 Final policy skills knowledge framework, 2013

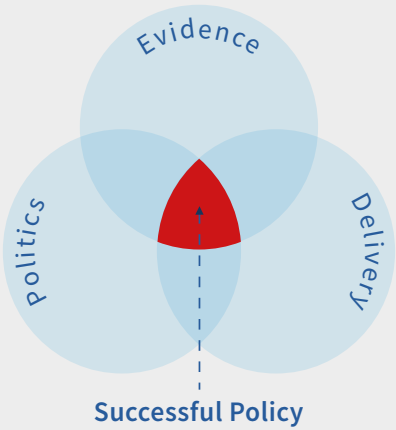
2 Overseas Development Institute, evidence based policy making, 2005

3 Institute for Government, evidence transparency framework, 2015

and social media, it does not capture the full complexity of the policymaking process. Policy decisions are made in light of many factors - evidence is only one. Social, ethical, legal, political, technological and cultural factors all play a role.

Ideally, policymakers would have clear preferences based on all gathered and understood relevant information, and base their choices on these preferences. This is referred to as '*comprehensive rationality*'. However, what happens in reality is '*bounded rationality*' where policymakers have unclear or incomplete information and unclear choices are made in an environment of multiple decision makers and pressures[4]. This makes the process non-linear and less structured. Successful policy depends on the use of a robust evidence base within a managed political context with early identification of how the policy will be delivered[5]. This is shown in **Fig.1**

Fig 1: The interaction of the main overarching elements to deliver successful policy



4 Institute for Government, evidence transparency framework, 2015
5 Civil Service Learning, skills and knowledge framework, 2013

Progress towards evidence based policymaking

There are various factors that enable successful policy development and implementation including[6]:

- High quality of the evidence base informing the decision-making process
- Individuals with skills in evidence analysis and evaluation involved throughout the policymaking cycle
- Institutional incentives for supplying evidence, e.g. for academics in universities
- Political incentives for using the evidence base
- Mutual understanding amongst all the actors in the policymaking cycle

While there are improvements that can be made in each of these areas, it is reassuring to note that EBPM has risen up the agenda of successive governments, and the use of scientific advice in government has become more prominent in policy discourse. As of 2011, every department was expected to have a Chief Scientific Adviser (CSA), appointed following external advertising and with the involvement of the Government Chief Scientific Adviser (GCSA)[7]. Since then, further positive steps have included: expansion of the science and engineering networks; an open policy making agenda including the third national action plan on open government[8]; reinforcement of the principle of openness by

6 Science Direct, reconsidering evidence-based policy: key issues and challenges, 2010

7 S&T Committee, fourth report on role and functions of CSAs, 2012

8 Open government national action plan, 2016

the independent commission on freedom of information[9]; creation of the What Works Centres, and the successful establishment of the Policy Lab and the Behavioural Insights Team.

A Cabinet Office exercise found that the 'evidence on evidence' in government was weak. This led the Institute for Government to develop a rapid assessment tool to rate government departments on the use of evidence behind policy decisions aiming to make government departments more accountable by understanding why they do what they do[10]. There have also been a range of actions by other organisations to support this agenda. There is a growing interest within academia to engage with and support EBPM, particularly in response to inclusion of policy outcomes in assessment of research impact within the 2014 Research Excellence Framework. Recognising both the responsibility and opportunity to inform policymaking, there has also been an expansion in the number of universities with dedicated units to support engagement of academics with policymakers. This is perhaps a good example of how incentives can help shift an activity from being one propelled by good will, to one that is more embedded at an institutional level.

Challenges for evidence-based policymaking

Despite recognition in government of the benefits of EBPM, and some positive momentum, there continue to be several challenges to overcome as demonstrated by prominent examples where the rationale given for policy decisions has

9 Independent commission on freedom of information report, 2016

10 Institute for government, assessing how government uses evidence to make policy, 2015

been in conflict with available evidence[11,12,13]. The four main categories that these challenges fall under are:

1. Actors in the policymaking process

Policymaking involves individuals and organisations with different cultures, incentives, expectations, pressures and timescales. This inevitably leads to complexity but robust and well understood structures as well as agreed terms of engagement all help to reduce barriers.

2. Types of evidence

There are many different types of evidence including scientific, economic, social and cultural. Furthermore, evidence may take many forms such as peer reviewed papers, previous government documents, findings from external reviews, data from internal management systems, reports from scrutiny bodies, user experience, case studies, views of external interest groups and subject experts[14,15] . The mix of types of evidence commonly used varies widely between teams, policy areas and departments[16]. Training individuals in handling and evaluating evidence is part of the solution.

3. Other factors that influence policymaking

Evidence is not the only factor taken into consideration during the non-linear and iterative policymaking process. Values, experience and judgement, information gaps, the need for secrecy, political expediency, available funds, timing and opportunity can all affect the decisions that are made.

11 Government announcement of Tier 2 changes, CaSE comment piece, March 2016

12 Independent, demand for food banks has nothing to do with benefits squeeze, says Work Minister Lord Freud, 2013

13 Newsnight investigation, Cook, C, 2014

14 Making better use of evidence in public policy making, 2016

15 Institute for Government, evidence transparency framework, 2015

16 The politics of evidence-based policymaking, Paul Cairney, 2016

4. Matching supply and demand

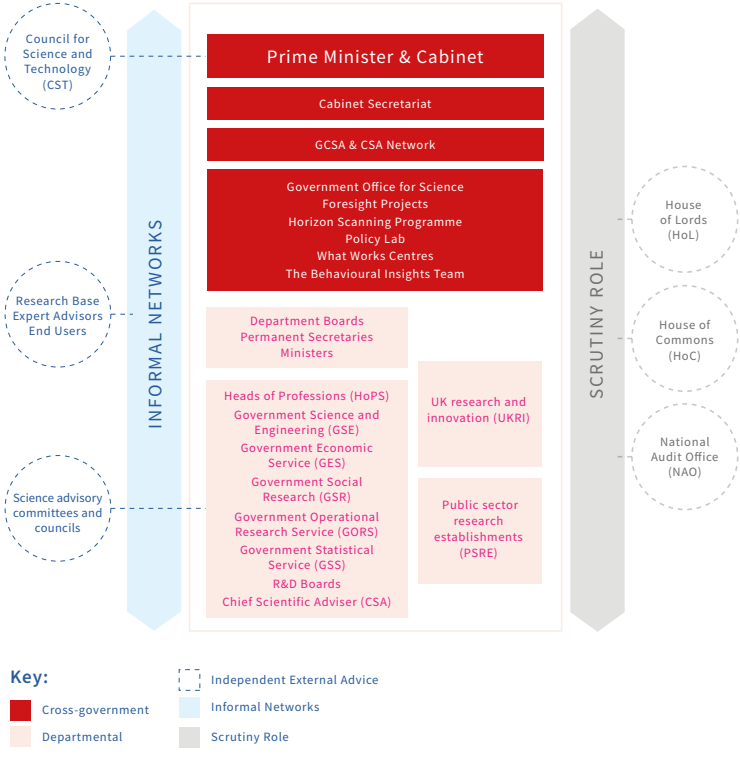
Having an available supply of evidence to feed into policymaking is not enough. This has to be balanced by the demand for and application of evidence in policymaking. To achieve an optimal supply and demand of evidence, availability and access to research must be balanced by quality, credibility and relevance of evidence as a solution to a given policy problem. Evidence provided needs to be presented in a succinct, contextualised and policy-ready manner. Increasing mutual understanding between government and those who need to inform policymaking is key to reducing barriers.

Architecture

Advice architecture overview

UK government has a variety of structures for scientific advice. The overall structure of the UK science advisory systems is shown in **Fig 2.**

Fig 2: Science Advice Structures



Available literature and in-depth interviews with individuals across the science policy landscape indicated that the UK government's science advice structure is viewed favourably by the international community as striving for the use of scientific advice[1]. However, there are several points within the advice structure that can be improved to make more efficient and appropriate use of evidence to inform policymaking in a transparent, honest and accountable manner. Government produces, commissions and draws on research, expertise and analysis from a wide range of internal and external sources.

Civil service

The civil service is central to the successful development and delivery of government policy. The civil service code[2] sets out four core values all civil servants are expected to uphold in their work: integrity, honesty, objectivity and impartiality. Objectivity is described as basing advice and decisions on rigorous analysis of the evidence. The code goes on to state that civil servants must set out the facts and relevant issues truthfully, and correct any errors as soon as possible; provide information and advice, including advice to ministers on the basis of the evidence; accurately present the options and facts; take due account of expert and professional advice. There is a duty not to ignore inconvenient facts or relevant considerations when providing advice or making decisions. These are essential characteristics of the civil service and must be respected, facilitated and championed by the Government and leaders in the civil service.

Analytical professions

Across the civil service there is significant science, research and analytical expertise. Individuals are grouped into

1 EU membership and UK science, House of Commons Science and Technology Committee, 2016

2 The civil service code, HM Government, 2015

five government analytical professions spread across departments: Government Science and Engineering (GSE), Government Economic Service (GES), Government Social Research (GSR), Government Statistical Service (GSS), Government Operational Research Service (GOSR). Heads of Professions (HoPs) are appointed within departments or government bodies that have significant activity in that area.

The GSE is made up of over 10,000 civil servants with a background or interest in science and engineering. They provide a link between government policy makers and expert scientific communities in academia, industry and government. An aim in the most recent GSE strategy is to encourage fresh talent into the profession. Likewise, CaSE has previously spoken of the benefits of increasing the number of people with scientific, statistical and analytical skills in the civil service[3,4]. We were therefore pleased that in 2015, the government launched a remodelled version of the Science and Engineering Fast Stream focusing on entrants with a master's degree or doctorate in science or engineering. This is one way to increase in-house knowledge and skills for bringing robust scientific analysis and evidence to bear on government policy and decision-making. The numbers are still relatively small. In 2015, there were 16 vacancies in the Science and Engineering Fast Stream with a 7.2% overall success rate (as % of applicants)[5].

There is a wealth of expertise across the civil service but often it is in pockets and it is difficult to share ideas, opportunities, resources and examples of best practice. In July 2016, GSE started a blog to encourage GSE members to do just that. The blog is the beginning of a positive initiative and demonstrates the Government's appetite for sharing best practice and ideas.

3 Science and engineering in government, Campaign for Science and Engineering, 2010
4 Putting science and engineering at the heart of Government policy, House of Commons Innovation, Universities, Science and Skills Committee, 2009
5 Civil service fast stream and fast track: annual report, 2015, HM Government, 2015

It can also be difficult to find key contacts in departments, a challenge not just for those outside government but also between or even within departments. The GSE online directory was created in 2014 as a resource articulating key science and engineering contacts in departments to help navigate complex government structures[6]. However, this was last updated in November 2015. There could be opportunities to improve signposting through displaying relevant contact information on departmental websites.

Public Sector Research Establishments

A large number of the GSE are based in public sector research establishments (PSREs), research institutes and laboratories attached to Research Councils or government departments. Many PSREs provide the infrastructure required for the applied research linked to its sponsor's remit with wider public benefit such as the Animal, Health and Veterinary Laboratories agency, National Nuclear Laboratory, and the Food and Environment Research Agency (Fera). They provide services such as evaluation testing and standard setting, and are an essential resource for supporting foresight and informing Government policy direction on issues such as climate change[7], damage to the ozone layer[8], responding to emerging diseases[9], or health and safety[10]. However, in recent years, many PSREs have been privatised[11]. This raises questions around diminishing research capacity in government.

6 Government science and engineering organisational directory of expertise, Government Office for Science, 2015
7 Strategies relevant to forests and climate change, Forestry Commission, 2017
8 The ozone layer, British Antarctic Survey, 2015
9 Disease alert service, Animal and plant health agency
10 Measurements in harsh operating environments, National Physical Laboratory
11 Letter from Sir Mark Walport to Andrew Miller MP, May 2013

The Government Chief Scientific Adviser

The Government Chief Scientific Adviser (GCSA) oversees science advice for policy which cuts across all government departments serving as a link between the government and the scientific community[12]. The GCSA reports to the Prime Minister and, within the civil service, to the Cabinet Secretary. The GCSA's role is to ensure that decisions across government are based on the best possible evidence and provide independent advice, scrutiny and challenge as appropriate at the highest levels of government.

The GCSA is supported by Government Office for Science (GO-Science), which works across Whitehall departments. GO-Science is currently physically located in the Department for Business, Energy and Industrial Strategy (BEIS) but its brief cuts across departments and therefore the roles of GCSA and GO-Science should be, and be seen as, distinct from any individual department.

Responsibility for independent science advice for policy has historically been carefully demarcated from a responsibility in determining the budgets, structures and processes used for research. The distinction between these two areas helps maintain the impartiality and robustness of evidence provided and used in the policy decision-making process. Arguably having the GCSA and GO-Science situated in BEIS, which also sponsors UK Research and Innovation (UKRI), could lead to the lines being blurred between 'science for policy' and 'policy for science'. In line with Select Committee recommendations since 2006 and multiple calls from CaSE and others, it would be most appropriate for the GCSA and GO-Science to be located centrally with other[13]

12 Chief Scientific Advisors and their officials: an introduction, Government Office for Science, 2015

13 UK election 2015 - CaSE science and engineering in Government, Campaign for Science and Engineering, 2015

cross-cutting functions in the Cabinet Secretariat. This would restore appropriate separation between 'science for policy' and 'policy for science', and more importantly would also help enhance much needed cross-government coordination of science advice.

Recommendation 1: The GCSA and GO-Science should be located centrally in the Cabinet Secretariat, alongside other cross-cutting government functions.

Chief Scientific Advisers

The role of departmental Chief Scientific Advisers (CSAs) is to provide advice to ministers and to work together under the leadership of the GCSA to support each other and to resolve cross departmental problems as part of the CSA network. The network is led by the GCSA and meets weekly. There is also a smaller deputy-CSA network. This strong collegiate network enables CSAs to support each other on departmental and cross-departmental issues and should be actively nurtured.

A recent letter written by the Chair of the House of Commons Science and Technology Committee highlighted a concern over the role of GO-science and the GCSA in sustaining the CSA network[14]. The current number of gaps, vacancies[15] and length of time between appointments of CSAs[16] is a serious concern[17]. The Government must commit to satisfactory succession planning to avoid periods where there is no CSA in post. As of April, 2017 the departments with or without CSAs are shown in Table 1[18].

14 Letter from Stephen Metcalfe MP to Sir Mark Walport, February 2017

15 Government Chief Scientific Adviser questioned on the 2015-16 annual report, Parliament UK, 2017

16 Letter from Stephen Metcalfe MP to Sir Mark Walport, February 2017

17 Letter from Stephen Metcalfe MP to David Davis MP, December 2016

18 Chief Scientific Advisers in the UK Government

Table 1: Departmental CSA and board level appointments

Ministerial departments	CSA	CSA on Board
Attorney General's Office	✗	—
Cabinet Office	✗	—
Department for Business, Energy and Industrial Strategy	✓	✓
Department for Communities and Local Government	✓	✗
Department for Culture, Media and Sport	✗	—
Department for Education	✓	✗
Department for Environment, Food and Rural Affairs	✓	✗
Department for Exiting the European Union	✗	—
Department for International Development	✓	✗
Department for International Trade	●	—
Department for Transport	✓	✓
Department for Work and Pensions	✓	✗
Department of Health	✓	✓
Foreign and Commonwealth Office	✓	✓
HM Treasury	●	—
Home Office	✓	✓
Ministry of Defence	✓	—
Ministry of Justice	✓	✗
Northern Ireland Executive	●	—
Scottish government	✓	✗
Welsh government	✓	✗
Non-ministerial departments		
Food Standards Agency	✓	✗
Forestry Commission	✓	✗
Agencies & other public bodies		
Health and Safety Executive	✓	✗
Met Office	✓	●
National Security (part of Cabinet Office)	✓	✗

Key ✓ = Yes ✗ = No ● = Vacant — = Unknown

To effectively perform their role, CSAs must be in a position to challenge and question the evidence underpinning decisions and pro-actively offer advice to ministers. From testing assumptions set out in project proposals, or informing assessment of risk, to suggesting where there could be value in commissioning research, CSAs can most effectively contribute their analytical and research expertise if they are involved in the early stages of departmental discussions. Ministers are rightly quick to seek out scientific advice in emergencies and where it is clear that scientific advice is needed[19]. However, if CSAs are limited to advising on issues on which ministers already know they need input on, it reduces their capacity to add value across departmental business[20]. To support this, many departments appoint the CSA to the department's Board. This approach should be expanded across all departments.

Recommendation 2: Each government department must appoint a CSA who sits on the Department's Board and put in place succession planning to ensure the post is continuously occupied.

Science Advisory Councils and Committees

Committees and Councils tend to be heterogenous in their structure and their remits may vary between departments. Science Advisory Committees (SACom) are present in most departments and serve a narrow and technical advisory purpose, such as the Scientific Advisory Committee on Nutrition. They tend to work relatively independently of each

19 Scientific advice and evidence in emergencies, House of Commons Science and Technology Committee, 2011

20 The role and functions of departmental Chief Scientific Advisors, House of Commons Science and Technology Committee, 2012

other without interacting or feeding into the work of other SAComs[21]. Science Advisory Councils (SAC), on the other hand, are structures providing broad advice and some cover the work of a whole department and report to the CSA or a minister, such as the Defence Scientific Advisory Council, with some responsibility for departmental R&D investment and strategy.

Government is not yet reaping the full benefits of the broad expertise and capability in SACs and SAComs and could benefit from being more joined-up within departments and across government. The Department for Environment Food and Rural Affairs (DEFRA) SAC aims to have oversight of all SAComs within or related to the department and it is undertaking an 'evidence review' to look at processes for sourcing and using external advice through SAComs. This approach could be extended across other departments. Further SACs could then be in a position to engage with the Cabinet Office's horizon scanning programme to improve join-up between departments[22]. Department's CSAs could also support join-up by raising awareness of activities and departmental challenges through the CSA network.

Cross-government structures

The Council for Science and Technology

The Council for Science and Technology (CST) is an advisory non-departmental public body sponsored by BEIS. It is co-chaired by the GCSA and provides advice to the Prime Minister on science and technology topics that are cross-departmental. Its members come from business, the National Academies and academia and it meets four times a year.

21 Oral evidence: GO-Science review of science advisory councils 2013, Parliament UK, 2014

22 Review of science advisory councils 2013,Government Office for Science, 2013

There could be opportunities for the CST to play an increased role in cross-government join-up for science advice[23].

Policy lab

The policy lab was set up in 2014 aiming to make policymaking more open and transparent as part of the civil service reform agenda. It acts like a consultancy, funded by departments to work on projects lasting from three months to a year. They work with departments to test new ideas, identify key stakeholders and end users, develop design processes, prototypes and delivery. The benefit of working with the policy lab rather than, for instance, commissioning research is that the expertise is retained in departments and it acts as a way to train and upskill civil servants in departments. They have developed the open policymaking toolkit to help equip policymakers with new policy tools and techniques to support transparent, evidence based policymaking[24]. This is a relatively new initiative so as yet, it is unclear to what extent it is used. However, it could provide a useful focal point and resource for training and upskilling across government.

What Works Centres

There are seven What Works Centres, including the Educational Endowment Foundation and the Early Intervention Foundation and Centre for Aging Better, set up with the aim of improving how evidence is generated, shared and used within a defined policy area. The network of centres has a national adviser based in the Cabinet Office but they themselves are not part of central government. They are joint funded by government, the Economic and Social Research Council and the Big Lottery Fund. They take a very research based approach, testing, piloting, and evaluating what effect different interventions have on policy challenges facing government. There seems to be a link in the creation

23 Ensuring a successful UK research endeavour, Paul Nurse, 2015
24 Open policy making toolkit, Cabinet Office, 2016

of this network of centres and increased interest in research methods such as randomised controlled trials (RCTs). Following the heightened interest, the What Works team set up a cross-government trial advice panel in 2015 to provide advice on RCT use[25]. It is encouraging that good practice from these centres can have a ripple effect across government. The capability in these centres could help support wider training and capacity building across government (see chapter two on Supply and Demand).

Horizon scanning and foresight functions

Government must not simply be responsive to issues as they arise, it must also seek to anticipate and take advantage of emerging and future challenges and trends. Horizon scanning and foresight functions are therefore essential. There is a central Horizon Scanning Programme Team in the Cabinet Office and a foresight function undertaken by GO-Science, along with de-centralised horizon scanning and foresight activity within individual departments scattered across government focusing on issues relevant to that department or team.

This is a major undertaking across government, however, there could be real efficiencies and benefits to be gained from harnessing the collective capability and insight of these teams. The Economic & Domestic Affairs Secretariat (EDS) within the Cabinet Secretariat are well placed to work with GO-Science to better coordinate the horizon scanning and foresight capacity of government[26,27]. This could be made easier by re-locating GO-Science centrally alongside EDS.

25 Cross-government trial advice panel, Cabinet Office, 2015

26 Cabinet office creates new EDS role to help Whitehall focus on “disruptive and long-term thinking”, Civil Service World, 2016

27 Cabinet secretariat, BBC, 2008

Informal networks

We all build informal networks of trusted voices to draw on as important sources of information and evidence. The same is true for everyone from government policy analysts to ministers. Informal networks, therefore, serve a critical function alongside formal science advice structures. Former CSAs report that building these informal networks through spending time outside their departments and government was essential to increase their awareness of new and emerging challenges and research findings.

However, the challenge is that advice received through informal networks can be highly influential without necessarily being rigorous or representative, particularly if it rests on an individual's views rather than on a body of evidence. Ideally there needs to be transparency about the evidence and advice that comes through these platforms. This was raised in discussion groups where there was an awareness that any individual's advice is open to bias and should be put in context alongside a wider body of evidence for it to be used to inform policy development. Training and raised awareness of how to test and assess the robustness of any given source of evidence and advice is part of the solution. Setting out the basis for a decision alongside a policy announcement would also help build transparency of the evidence base used to inform decisions.

Science advice structures in new departments

Appropriate structures and processes should be put in place by the UK government and parliament to ensure scientific and technical expertise and advice is appropriately accessed throughout the process of leaving the EU and setting up new trade arrangements. This will require appropriate structures, processes and appointments to be built into the Departments for Exiting the EU and International Trade where significant technical and scientific expertise will be required, for instance in their work around regulation and standards.

The appointment of a CSA will ensure scientific evidence used during the negotiation process in the run up to leaving the EU, is robust.

Recommendation 3: Set up robust science advice structures in the Department for Exiting the EU and Department for International Trade.

Expectations and guidelines

Some of these challenges are broadly recognised and led to the development of some rules of engagement between government decision makers and those who provide independent advice. In 2010, the then GCSA published 'the use of Scientific and Engineering Advice in Policy Making' which set out guidelines for how scientific advice should be sought and applied within government[28]. Despite the publication of clear guidelines, concerns remain over the extent to which these guidelines are being adhered to across government. For instance, the principles state that 'government should publicly explain the reasons for policy decisions, particularly when the decision is not consistent with scientific advice and in doing so, should accurately represent the evidence', as previously called for by CaSE[29]. They also state that 'scientific advisers are free to communicate publicly their advice to government, subject to normal confidentiality restrictions, including when it appears to be inconsistent with government policy.' This is made extremely difficult if ministers have not declared the basis on which policy decisions have been made. There are a few examples of when this has been done well[30]. However,

28 The Government Chief Scientific Adviser's guidelines on the use of scientific and engineering advice in policy making, Government Office for Science, 2010
29 Science and Engineering in Government, Campaign for Science and Engineering, 2014
30 Letter from Theresa May MP to ACMD chair Professor Les Iversen, July 2013

often this principle is not adhered to, leading to a lack of transparency regarding the basis for the policy. Guidelines state evidence must not be cherry-picked or publication of research delayed to fit a policy decision but there are also concerns about excessive control around the publication of reports from independent committees[31].

A new GCSA will be appointed this year. It could be very helpful and timely therefore to review government practice against the guidelines to help inform their priorities and program of work as they take up office.

Recommendation 4: The House of Commons Science and Technology Select Committee should undertake an inquiry to review the uptake of and adherence to government guidelines on 'the use of science and engineering advice in policymaking'.

31 Missing evidence: an inquiry into the delayed publication of government-commissioned research, Sense About Science, 2016

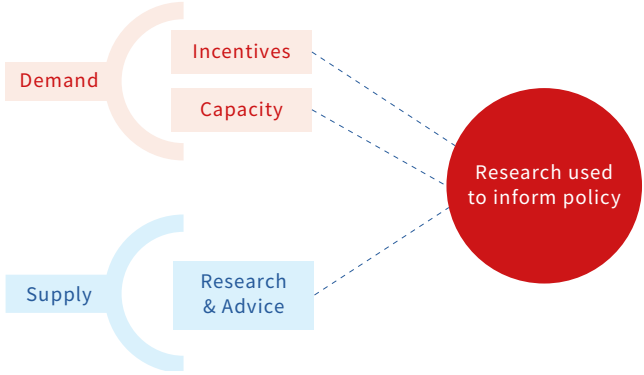
Supply and Demand

In chapter one we considered the overall structure of the science advice architecture within departments and across government. However, does the government, and its constituent parts, have an appropriate appetite, or demand for evidence and science advice? Where demand is low, could it be stimulated? What are the reasons behind unmet demand for evidence and advice? Are suppliers aware of needs from higher up the chain? Are they able to influence and drive demand? It is never quite as simple as supply and demand, but it's a helpful place to start. In a supply chain, all the component parts are dependent on each other. Over supply when there isn't demand, and unmet demand cause frustration, ineffectiveness and waste. Thinking of the evidence system as a supply chain enables us to look at the push and pull factors for the provision, access and use of evidence and science advice.

On the understanding that increased access and use of evidence will support better informed policy and funding decisions, action can be taken to increase demand for evidence in government. For instance, requiring departmental spending bids to present a supporting evidence base; training and equipping officials in analysis and evaluation of evidence; the use of evidence checks by Parliamentary committees; and requiring the publication of the evidence base for policy decisions have all been used to stimulate the use of evidence in policy decisions[1].

1 Using Evidence: How research can inform public services, Nutley, Walter and Davies, 2007

Fig 3: The interaction of multiple factors in evidence supply and demand[2]



Promoting long-term thinking

In 2014, CaSE recommended that it would be a beneficial annual exercise for departments to publish major, long-term research questions[3]. Evidence gathering often happens on very tight timelines in government and is a process of drawing together the body of existing research. This would help grow internal demand for research, prompting more long-term thinking within the department and flagging evidence needs in advance in a way that realistically allows time for new research to be undertaken where required. These exercises to look ahead and anticipate research areas of interest can also inform departmental commissioning of research as well as better enabling researchers to be aware of government priorities to enhance the research-policy relationship from the supply-side.

2 Adapted from What is the evidence on evidence-informed policy making? International Network for the Availability of Scientific Publications (INASP), 2013
3 Science and engineering in government, CaSE, 2014

This recommendation was reiterated in the Nurse Review of Research Councils[4] which proposed government departments take a more strategic approach to R&D, including maintaining 'statements of need' that set out the most important research questions confronting the department. Departments are in the process of developing and publishing what are now called 'areas of research interest'.

The CSA is well placed to oversee this process and provide leadership within a department that draws largely upon scientific evidence. In departments that draw less on scientific research and more on other types of research, such as social research, a senior influential analyst such as the chief economist might be better placed to oversee the review and publication of an annual update of the department's 'areas of research interest.'

If they are on the department's Board, as we recommend, the CSA will be able to ensure the process benefits from support, buy-in and strategic input from the Board. They should also be able to draw together the expertise of the Heads of Professions and other relevant teams within the department. Further if the CSA network is functioning well it should provide an opportunity for join-up across departments, perhaps leading to shared areas of research interest or greater awareness of existing research and expertise held more widely across government.

Recommendation 5: Each Departmental CSA should oversee and publish an annual update of their department's 'areas of research interest.'

4 Ensuring a successful UK research endeavour, Nurse Review, 2015

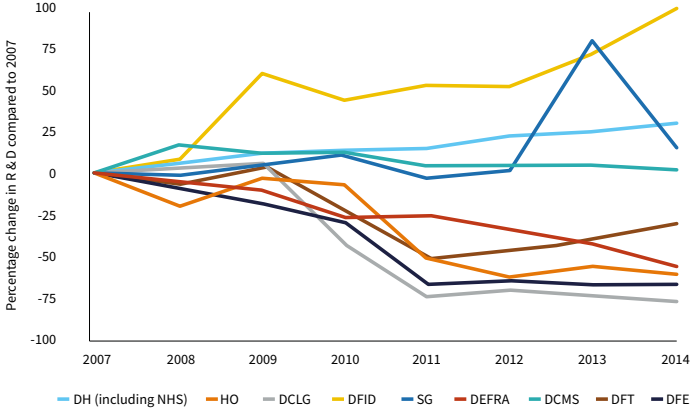
Prioritising research budgets

Challenges around commissioning research were a repeated feature of discussions and interviews for this project, from those on both sides of the process. There are concerns that demand for research is too low. This could be because of insufficient in-house capacity to identify where research is needed or would be beneficial. There is also the challenge of ensuring there is sufficient funding available. In general, government investment in science via departmental spend on R&D receives much less attention than the 'science budget'. Departments' R&D spend is used to invest in research to develop and evaluate new ideas and existing policies.

In recent years, CaSE has analysed fluctuations in departmental spend on R&D, calling attention to periods of widespread disinvestment[5,6]. For example, between 2009/10 to 2011/12, half of departments reduced R&D expenditure by over 20%, some by 50% or more, in disproportionate reductions compared to overall departmental budget changes. This contributed to a reduction in total government spend on R&D in 2011/2012 to its lowest level in real terms for ten years[7]. There were significant cuts to departmental spend following the 2010 Spending Review but cuts to R&D budgets were disproportionate in many departments[8]. Levels of R&D spend then broadly levelled off towards the end of the spending review period. We will continue to monitor investment levels to see whether there was a similar effect following the 2015 Spending Review.

5 R&D suffers biggest cuts in government spending, Financial Times, 2014
6 Competitors spend more on R&D, Financial Times, 2012
7 Departmental R&D analysis, CaSE, 2014
8 Government R&D hit by disproportionate cuts, CaSE, 2012

Fig 4: Trend in departmental R&D spend over the period 2007 to 2014[9] (Departments with R&D spend £25 million or less in 2007 have not been included in the data set)



Internal demand for research and the level of research budgets are linked. When CaSE questioned departments about reductions to R&D budgets in 2012, some responded that R&D spend levels were a reflection of a drop in internal demand, rather than a cut to the budget[10]. There is very real tension within departments that every pound spent on research could be seen as a pound less spent on frontline support – whether that be schools, disability support or investment in transport links. Cutting R&D on this short-term basis could be counterproductive as relatively small amounts of spend on research can lead to better front line provision and increased cost effectiveness in the long-term. This means it is particularly important in times of constrained public finances that government departments prioritise investing in R&D. However, this requires an understanding of the value

9 UK government expenditure on science, engineering and technology, Office for National Statistics, 2016

10 Science and engineering in government, CaSE, 2014

and role of research and good leadership and oversight of the research budget.

The CSA guidelines dictate that the CSA should be involved in any decisions that affect departmental research budgets[11]. Further, there is a requirement that 'departments should consult the GCSA and HM Treasury in advance of any potential cuts to research budgets or expenditure, including those that have implications for the funding of cross-cutting research'. In 2012, CaSE asked each department if their CSA had been consulted about changes to R&D budgets in line with recommendations from GO-Science and found that none of the CSAs were consulted[12]. The CSA should be involved in overseeing the department's R&D budget and in a position to help ensure decisions are taken in an evidence-based and strategic way, resisting the political imperative to divert resources to services and programmes more likely to deliver short term 'wins'. This is an area to explore as part of the inquiry into science advice guidelines recommended in chapter one on Architecture.

Spreading best-practice

Of course, the amount spent is not the only indicator of value. Commissioned research must also be high-quality, relevant, and good value for money[13]. Public sector bodies have to follow procurement directives and, while still a member of the EU, the UK is required to adhere to EU directives on public procurement. However, within the guidance provided, a range of different approaches are taken across government.

There seems to be both the appetite and the opportunity to improve the way in which research is commissioned by

11 Chief Scientific Advisers and their officials: an introduction, Government Office for Science, 2015
12 Departmental R&D analysis, CaSE, 2014
13 The green book, appraisal and evaluation in central government, HM Treasury, 2011

government. Personal observations and reflections of some interviewed for this report showed there was an imbalance in the attention paid to complying with the rules and insufficient thought about the purpose of the commission. There is also a concern that those on the frontline commissioning research lack sufficient understanding of the policy issue and, therefore, optimal methods of procuring appropriate research. Together this can lead to poor specifications which, in turn, lead to poor conclusions.

To drive value for money there is a focus on free and open competition. However, for those supplying research, developing a bid requires a large administrative effort. Procurement forms are often long and fragmented, with multiple sections requiring input from across an organisation. This complexity can lead to commissioned work predominantly going to a handful of big companies or perhaps universities which have expertise in putting together bids and can dedicate teams to such work, artificially narrowing the pool of potential bidders. As with many other areas of public procurement, the entry barriers can be too high for smaller players, which in turn could impact on value for money for the Government.

There are a number of factors that are important in effective commissioning of research:

- Informed commissioners - those commissioning the research have sufficient understanding of research to ask the right questions
- Building in safeguards - quality assurance is built in to every stage of the procurement process
- Strong feedback - Reducing distance between commissioners, researchers and end users to address complex needs and to grow mutual understanding

- Clear communication - Tenders should be written clearly and simply to encourage a wider pool of bidders

There are examples of good practice. The Department of Health has well defined structures for commissioning, funding and managing research that is focused on the needs of policymakers through its Policy Research Programme (PRP) which sits in the Science, Research and Evidence Directorate. The PRP commissioning priorities are shaped by the department's R&D committee, which is chaired by the CSA, ensuring there is a strategic approach to commissioning research. The PRP does not use the procurement framework. Instead they have a 'Policy Research Programme application form' which requires applicants to state how the research addresses the questions in the department's research specification. After a peer review process, a commissioning panel of external experts and public and patient representatives, review and decide on who successfully secures the tender. An essential element of the PRP are liaison officers who build up significant expertise working as effective knowledge brokers between academics and policymakers with an eye on the entirety of the process. Once the research has been completed the outputs are peer reviewed and policymakers can decide how they wish to use the research in making decisions. Many departments take a decentralised approach to research. However, one of the benefits of the PRP model is that it provides oversight of the full body of research commissioned by the department to reduce duplication and increase efficiency.

There could be benefits from expanding a PRP approach more widely across government. For some departments, it may not be appropriate to replicate the large-scale operation in the Department of Health. However, there are certainly features of the PRP-model that all departments could learn from and adopt, such as robust quality checks, transparency of process and outputs, strong, strategic leadership and oversight of

the entirety of the department's research for policy, and involvement of end-users in the decision-making process. In the medium term leaving the EU provides the opportunity to review procurement guidelines for commissioning research in the UK.

Recommendation 6: The Cabinet Office should develop UK procurement guidelines for commissioning research informed by best practice.

Maximising the benefits of research

There is an ongoing challenge of maximising the benefit derived from government research. The structures and processes for joining up evidence and advice across and between departments are underdeveloped. Adopting elements of the PRP model could help to address some of these. But there is a great opportunity for government to make better use of the body of evidence it generates by improving corporate memory.

Retaining corporate memory is difficult even within departments, let alone across government. Some departments have their own databases where research is registered and progress to publication is tracked. Other departments list published studies. But some do not have their commissioned research in one accessible place. This can lead departments to revisit policy questions unaware of research the government has previously commissioned or undertaken. Despite the recognition of the benefits of greater join-up, in practice it can be difficult to access research carried out or commissioned by other departments. At a basic level, some arm's length bodies even face barriers accessing the research database of their sponsoring department. The inability to access information and 'reinventing the wheel' has led to

wasted efforts which could cost the government £500m a year[14].

There is a real opportunity for digital records to be used better to improve institutional memory[15]. CaSE has previously recommended that all research performed or commissioned by government departments must be freely, publicly available in a readily-searchable, online archive[16]. After highlighting the absence of a comprehensive account of how much government research is commissioned and how much of it is published, a recent report by Sense about Science made a similar recommendation for government to create a standardised central register of all externally commissioned government research[17].

Ideally a shared database would hold a register of in-house and commissioned research including information on who is carrying out the research, expected outcomes, current stage of development and expected timeline of delivery. In addition, it would be useful to have details of the lead department and person responsible added to the database both for easing contact as well as for promoting accountability. For it to be sustainable, it is important that creation of the database is carried out in a way that does not increase the logistical and bureaucratic burden for civil servants. This proposal raises a range of technical and practical challenges, but a good first step would be to tackle commissioned research.

There is already a move towards modernising data infrastructure within government in part through the work of the Government Digital Service (GDS) in the Cabinet Office. In 2016, CaSE worked with the Cabinet Office on plans for the findings of government commissioned research to be made more easily accessible across departments in a searchable

14 Better information for better government, Cabinet Office, 2017
15 All Change, Institute for Government, 2017
16 Science and Engineering in Government, CaSE, 2014
17 Missing evidence, Sense about Science, 2016

database, following our engagement with them on the anti-lobbying clause and new standards for government grants. This endeavor should be properly supported and be done with the involvement of the wider research community where there is also significant effort being put into making data and research outputs more openly available.

A second phase could then be to include all disclosable government research in the database with the ultimate aims of making a version of the database publicly searchable. This would not only help improve transparency and accountability but also make available a large body of evidence generated from government research which would be of great interest and significance to the wider research community.

There are enormous gains to be made from getting this right. And with the ever-increasing opportunities technology provides for easy and safe storage and access of vast amounts of complex data it will be increasingly unacceptable for government to be unable to account for the research it has undertaken and not to maximise the use of the body of knowledge created by government.

Recommendation 7: The Cabinet Office should oversee the creation of a cross-departmental database of government research.

Developing in-house capacity

Alongside this, departments need to be intelligent customers, with sufficient expertise in the department to clearly articulate their research needs and manage the commissioning process. Since 2005 the number of civil servants has dramatically fallen by 28%[18] resulting in a trend towards fewer specialists and more generalists. This has been coupled with the full or part privatisation of many Public Sector Research Establishments (PSREs) diminishing in-house capacity and increasing dependence on external sources of research.

Options to grow departmental capacity and capability are then to reverse the trend and rebuild in-house expertise or to develop civil servants as expert customers better able to source research, evidence and advice. In the current political and financial climate, it is unlikely that the Government will choose to dramatically increase civil service numbers, so we propose a focus on building capability as expert customers.

Better equipping and supporting civil servants to use evidence is a good investment for Government. Within a resource-constrained environment, better equipped officials will be able to make better use of research and evidence already available and help improve commissioning and evaluation, contributing to increased efficiency and effectiveness in the long-term. Departmental leadership, from Board level down, needs to actively support this endeavour if it is to succeed as it requires time, resource and supportive departmental structures.

There are a number of networks, structures and functions across government that are involved in training and sharing

18 Facts, analysis and comment, civilservant.org.uk, 2017

good practice but it needs to be more widespread and joined-up. Cross-cutting expert teams such as GO-Science and GDS certainly have a role to play. The GDS has already recognised the need for upskilling the civil service in digital skills to transform the way it operates and delivers services[19]. Within departments, CSAs and Heads of Professions already have a role to support non-specialist colleagues. They are well placed to take a lead within departments and their remits should include a responsibility to identify areas of training required by staff. As the new GCSA takes up post and as, we hope, CSAs are appointed to fill the current gaps and vacancies, the CSA network could provide a good forum for supporting a strategic and joined-up approach to training across government. There could be benefits from increasing connectivity between HoSEPs and other analytical professions from different departments which can at present be relatively disjointed. Some have suggested there could be value in formalising HoSEP roles[20] to help support better coordination across the network.

Government should ensure that those in the civil service fast stream and apprentices receive training in the good use of evidence to ensure that all those starting out in the civil service have a solid foundation on which to build. More broadly, training could be in-house in the form of seminars, 'open surgeries' for addressing specific issues led by departmental specialists or external experts, or other forms of peer-to-peer learning. There also needs to be resource for targeted training, accreditation, and continuing professional development for those in more specialist roles. Where specific training needs are identified, departmental budgets should include investment in such skills. This is in line with the Government's

19 Policy paper, government transformation strategy, HM Government, 2017
20 What next for the head of the GSE profession? Government Science and Engineering blog, 2017

push to get employers across the economy investing in training and upskilling of staff.

Recommendation 8: Chief Scientific Advisors, in consultation with Heads of Profession, should monitor skills needs of the department and make recommendations for training.

Improving evidence supply

An essential part of science advice in government is to harness the broad expertise of the research base, subject experts, and practitioners outside of government to inform decisions.

Incentivising supply

Within academia, the Research Excellence Framework (REF), 2014 has contributed to encouraging researchers to recognise the impact of their work beyond academia[21]. One of the categories for measuring impact of research in the REF was to affect, change or benefit public policy or services. An initial analysis of impact case studies showed nearly half of the case studies mentioned 'policy' as their type of impact. Twenty per cent of case studies contributed to 'informing government policy'[22]. This will not capture all activity but is an indicator of the valuable contribution academics make to the policymaking process.

Whilst the REF now provides a valuable incentive for engaging with policymakers, such activity (i.e. communicating or translating research for policy audiences) is not always well

21 Beyond academia – interrogating research impact in the research excellence framework, PLOS One, 2016
22 The nature, scale and beneficiaries of research impact, King's College London and Digital Science, 2014

reflected in recognition and reward structures or standard career progression in academia. The next REF exercise is currently being designed and there is an opportunity to better reflect and reward the use of research to inform public policy and services[23].

Often those in government are not looking for new research in any area but rather systematic reviews or rapid response reports that provide context and draw on the body of evidence on any issue. However, undertaking this kind of activity is not incentivised. Some organisations are dedicated to this kind of evidence review, such as Cochrane which undertakes systematic reviews of primary research in the human healthcare and health policy sphere. There could be value in considering whether and how a stream of research funding from departments and from what will become UKRI could be used to support this activity in other spheres of research and policy. Other incentives could be created by better recognising this activity through REF, which has a major effect on research are institutional behaviour.

Within government there seems to be a move towards accessing more research and advice on a pro-bono basis. While this may sometimes be appropriate, there is a question as to whether this is sustainable or indeed desirable. Coupled together, insufficient incentive or reward on both sides for highly valuable activity could be a barrier to significant progress.

Equipping researchers and growing mutual understanding

Alongside setting up appropriate incentives, researchers need to be equipped to engage with the policymaking process. There is a significant culture gap between the two.

23 Building on success and learning from experience, HM Government, 2016

Government and research operate on different timelines, have different expectations and have different objectives. There are a range of different routes, formal and otherwise, to feed into policymaking. But for those without prior experience, it can be difficult to know where to start and some lack the confidence to do so due to insufficient information on how and when to engage. Others are reluctant to engage, for instance due to the potential of misinterpretation of the evidence provided by them (e.g. use of evidence on climate change policies).

There have been some steps taken towards closing the gap between policymakers and experts who feed into policymaking and there are a growing number of initiatives created both within government and by external bodies. One model is to set up strategic research partnerships that take a long-term view to promoting engagement between researchers and end users[24]. Another way to support experts and researchers to feed evidence into the policymaking more effectively is to improve understanding of the policymaking process. A growing number of universities have policy units that provide such support. Learned and professional societies also work to help bridge the gap between policy makers and academics.

Impact Acceleration Accounts (IAA)[25] have been extremely useful in supporting placements, secondments and exchanges of academics into government in areas where they have research expertise. There is currently a diversity of approaches in different Research Councils[26,27] creating an artificial constraint of applicants needing to meet certain

24 Met Office academic partnership, Met Office
25 Impact acceleration accounts - a common research councils approach, Research Councils UK
26 Impact Acceleration Accounts, Economic and Social Research Council
27 Impact Acceleration Accounts pilot, Biotechnology and Biological Sciences Research Council

discipline-based criteria. As UKRI is formed, it provides an opportunity to create a cross-cutting UKRI IAA which would enable universities to focus more straightforwardly on matching candidates to policy needs. In addition, UKRI could explore other options for making the barriers between academia and government, and indeed business and charity, more porous.

More broadly, exchange programmes, secondments and rotations provide two-way benefits; helping politicians and officials develop their research understanding, and improving researchers' understanding of how government works and how best to provide evidence in a policy-ready way. It also helps develop informal networks that can be drawn on in years to come. Pairing schemes such as those offered by the Royal Society and Centre for Science and Policy[28,29,30] are over-subscribed by officials and Parliamentarians indicating the appetite for this activity. These programmes are more about promoting understanding of the other environment rather than specifically working on shared challenges. There is much to be gained from increasing mutual understanding as well as building more connections across the evidence supply chain. This will require appropriate means of creating links, as well as appropriate incentives within government and the research base.

Recommendation 9: UKRI should expand and encourage exchange programmes and secondments into departments.

28 Centre for Science and Policy, University of Cambridge
29 Pairing scheme, The Royal Society
30 POST fellowships, Parliament UK

Evaluation and Accountability

"Both politically, in terms of being accountable to those who fund the system, and also ethically, in terms of making sure that you make the best use possible of available resources, evaluation is absolutely critical."

Julio Frenk, Minister of Health, Mexico, 2005

When it comes to evaluation, there is good will, and some good practice within government. There is still much to be gained from more systematic and transparent use of research evidence for evaluation at all stages of the policy cycle.

What is evaluation?

"Evaluation examines the actual implementation and impacts of a policy to assess whether the anticipated effects, costs and benefits were in fact realised. Evaluation findings can identify "what works", where problems arise, highlight good practice, identify unintended consequences or unanticipated results and demonstrate value for money, and hence can be fed back into the appraisal process to improve future decision-making.[1]"

Evaluation can take on many different forms and can occur in different ways at all stages of the policy lifecycle including[2]:

- Evidence evaluation to assess the reliability, relevance and robustness of the evidence base

1 The Magenta Book: Guidance for evaluation, HM Treasury, 2011
2 Successful commissioning toolkit, National Audit Office

- Impact evaluation to assess the likely effects of policies and programmes pre-implementation as well as assessment of the actual impact post-implementation
- Process evaluation and ongoing monitoring during the lifetime of the project or programme
- Economic evaluation assessing value-for-money comparing costs and benefits, both as part of the business case and post-implementation.

Why is it worth doing evaluation?

Looking to public opinion, norms, or personal preference to guide policy is not uncommon. Since 1965, United States taxpayers have paid over $280bn into a programme called Head Start, intended to give additional support to educationally and economically disadvantaged children in their early years. However, a comprehensive government evaluation of the programme in 2012 found little evidence of lasting benefit to the children who took part[3]. Earlier evaluation could have seen the funding and effort used more effectively. Where the Government mantra is to 'do more with less'[4], a good place to start must be to ensure that policies and programmes that are funded and supported are well-evaluated.

Good evaluation is fundamental to the principle of good government. It supports democratic accountability, delivery of more effective policies and services, and efficient use of taxpayers' money. In principle, this is widely accepted across government and by all political parties.

The UK Government has created guidelines and tools to support policy evaluation including three comprehensive official guidance documents; The Magenta Book: Guidance

3 Third grade follow up to the Head Start Impact Study, OPRE 2012
4 David Gauke speech, February 2017

notes on policy evaluation[5], The Green Book: appraisal and evaluation in central government[6], and Regulatory Impact Assessment: intended for the assessment of costs, benefits and risks of proposals[7]. The Magenta Book states that "high quality evaluation is vital" for improving central and local government efficiency and effectiveness. It goes on to say that "the risk of not evaluating, or of poor evaluation, is that policy makers are not aware if policies are ineffective or, worse still, result in overall perverse, adverse or costly outcomes. The knowledge we gain from good evaluation can be used to increase policy effectiveness and is essential in informing the development of new policies to achieve the best results." There are some instances where evaluation is a formal requirement, but more broadly government guidelines state that "all policies, programmes and projects should be subject to comprehensive but proportionate evaluation, where practicable to do so." Government should challenge itself to follow the guidelines contained in these documents routinely, which would represent a substantial step forward.

How does government currently perform?

Despite recognition of the benefits of evaluation, some good guidance and support in principle across government, there is room for significant improvement. The NAO commissioned an independent review of government evaluations in 2013[8] which found some good practice but some significant weaknesses. One comment that stood out was the view that "there is a danger of setting the bar too low and failing

5 The Magenta Book: Guidance for evaluation, HM Treasury, 2011

6 The Green Book: Appraisal and evaluation in central government, HM Treasury, 2003 (updated 2011)

7 Better policy making: a guide to regulatory impact assessment, Cabinet Office, 2003

8 Review of Government evaluations: A report for NAO, Gibbons, McNally and Overman, 2013

to keep pace with international standards in programme evaluation".

Concerns have been raised about policy approval despite significant gaps in the coverage of evaluation evidence[9]; poor-quality evaluation design; use of outdated evaluation methods[10]; insufficient use of evaluation evidence; and difficulties faced by independent researchers in accessing administrative data and other government data to conduct their own evaluations of government interventions[11]. There is a view that in practice evaluation can be undertaken as a tick-box exercise, to provide a required audit of programmes or policies without driving learning and future practice[12,13]. Although some improvements may be difficult and costly, there are many improvements that could be more easily introduced to extend good practice and move towards best practice in evaluation.

Lessons from practitioners and published literature suggest more effective evaluation can be supported by:

- Factoring evaluation into the design of policies and programmes, where possible building in a control or counterfactual[14]
- Clearly setting out the aims and purposes of any policy or programme

9 BIS's capital investment in science projects, NAO, 2016

10 Review of Government evaluations: A report for NAO, Gibbons, McNally and Overman, 2013

11 Evaluation in Government, NAO, 2013

12 The learning evaluation: A theoretical and empirical exploration, Evaluation Review, 29 (6) (2005), pp. 591–612, J. Edelenbos, A. Van Buuren

13 Assessing network-based collaborations: Effectiveness for whom? Public Management Review, 10 (6) (2008), pp. 733–749, BW Head

14 Review of Government evaluations: A report for NAO, Gibbons, McNally and Overman, 2013

- Defining criteria for success and how they will be measured
- Selecting the most appropriate forms of evaluation bearing in mind factors such as scale, cost and available data
- Allocating time and resource for evaluation
- Appropriate use of independent evaluators
- Publishing the outcome of the evaluation

Evaluation isn't easy. It requires planning. It requires time. It requires join-up across departments and appropriately skilled people. To be most worthwhile there also needs to be the continuity and political will for evaluation outcomes to feedback and inform future policy and funding decisions. There are a number of reasons why policy evaluation may not be appropriately prioritised:

- Government is invariably under time and political pressure to deliver, and evaluation can be inconvenient or impractical[15]
- Relatively few civil servants and limited funding are focused on evaluation[16]
- Evaluations can be politically awkward, producing unfavourable findings, such as showing that announced or ongoing policies or programmes are not effective or efficient, or alternatively that those that have been cut were effective and efficient

15 Policy making in the real world, Institute for Government, 2011

16 Evaluation in Government, NAO, 2013

- Changes in government policy and staff turnover can lead to shifting priorities meaning old policies are dropped or changed without reference to or prior to evaluation[17]
- Quality evaluation requires significant specific knowledge and skills, and often independent evaluation is preferable, meaning expertise must be bought in at a cost but budgets are tight

These barriers need to be overcome to realise the Government's own evaluation ambitions and significantly improve practice. This should include a combination of creating incentives, growing capability, and increasing transparency and accountability for evaluation.

Taking a strategic approach

A number of departments have published strategies to tackle some of the barriers to evaluation and work towards coordinating, embedding and strengthening evaluation across all their activities. Two features of existing strategies are a focus on building evaluation capability and capacity, and having clearer oversight of evaluation at a departmental level.

The need to improve and expand capability on evaluation methods is widely recognised. For instance, the Department for International Development (DFID) has an active evaluation strategy[18] that introduced a formal accreditation scheme to help ensure that analysts have the necessary skills to oversee and manage, or design and deliver evaluations. There is a distinction between those whose core role is evaluation and those for whom evaluation is a part of their primarily non-evaluation role. As part of accreditation, all staff members responsible for commissioning, managing or conducting evaluations need to demonstrate continued professional development (CPD) in evaluation on an annual

17 Missing Evidence, Sense about Science, 2016
18 DFID evaluation strategy 2014-2019, 2014

basis. Having a formal process enables the department to have a reliable means of assessing their evaluation capability and capacity, to more easily spot where there are gaps and to provide tailored training. In BIS, the strategy proposes setting up a network of internal evaluation experts who can share expertise with non-specialist colleagues as well as being deployed to contribute to specific complex projects. This informal approach seems to be more common. The strength of the accreditation approach is that it builds in a baseline expectation and provides a level of professional accountability to evaluation. The CPD requirement also helps practice to keep pace with the development of evaluation techniques which continue to evolve[19]. DFID routinely attracts public scrutiny of its use of the aid budget meaning it has worked hard to create more robust evaluation structures. Even without the prompt media attention, there is value in other departments taking a more professionalised approach to training and skills for evaluation.

Another feature of evaluation strategies is to set out clear accountability and responsibility for evaluation, with some central resource. Ultimately accounting officers are accountable to Parliament for the proper stewardship of public funds. Accounting officers, such as permanent secretaries within departments, are responsible for ensuring procurement, projects and processes are evaluated for suitability, effectiveness and quality[20,21]. However, at a more granular level, where day-to-day responsibility rests may reasonably look different in different departments.

One model is to set up a policy monitoring and evaluation

19 Review of Government evaluations: A report for NAO, Gibbons, McNally and Overman, 2013

20 Managing public money, HM Treasury, 2015

21 The financial reporting manual, HM Treasury, 2015

board[22,23] whose role includes monitoring skills and capacity for evaluation as well as reviewing major policy evaluations. Others have a central evaluation team that support a more decentralised responsibility for evaluation. The approaches to improving evaluation will necessarily be different across departments with very different structures, budgets and levels of activity. However, there does seem to be significant value in each department actively considering its evaluation strengths and weakness alongside its evaluation requirements and setting out a strategy of how to raise the bar. In the interests of practicing what you preach, there should also be a requirement to monitor progress and report annually to the Board of the department, both to drive accountability but also to allow the strategy to be reviewed in light of evaluation evidence.

Recommendation 10: Departments should establish and publish an evaluation strategy and report annually to their Departmental Board on progress.

Embedding evaluation

A common concern raised in discussion groups was the extent to which evaluation was embedded at every stage; from evidence evaluation and ongoing monitoring to full-scale reviews. There are some stages in the policy cycle which could act as checkpoints for ensuring robust evaluation is built-in, including business case approval, policy announcement and policy change.

However, there needs to be a culture shift in politics for evaluation to be able to make its full contribution to EBPM.

22 Evaluation strategy 2015-16, Department for Business, Innovation and Skills, 2014
23 Evaluation plan 2016, Department for Business, Innovation and Skills, 2016

At one level, there is cross-party support for evaluation feeding back into policy decisions. However, in reality, amending or halting a previously announced policy following evaluation would risk being branded as a U-turn and blasted by the opposition and the press, denting political capital. This is all the more likely on high profile or high-cost policies and programmes. It creates a toxic environment for evaluations to feedback and inform policy development and change.

Arguably political risk is, therefore, greatest when policymakers advocate a programme and then cannot amend it no matter what the results[24]. In this sense, evaluation, and planning for evaluation as part of policy announcements, can reduce political risk because it allows politicians to claim the evidence high ground and to demonstrate their willingness to pro-actively change course in response to new evidence.

A clear understanding of the methods and measurements that will be used to evaluate a policy or programme must be embedded from the outset. This will avoid missing opportunities during policy development that can be used to make monitoring and evaluating more robust. Seeking to design evaluation methods retrospectively is likely to present the challenge of insufficient or unreliable data, and measurement against baselines or counterfactuals is difficult to retrofit. If the aim of the policy and measures of success haven't been clearly set out at the beginning there is the temptation for evaluation to simply look at outcomes, rather than ascertain any measure of causality or performance against intended outcomes. This much is acknowledged in government evaluation guidelines, where departments are required to explain how they intend to reliably evaluate impacts of the policy when it is announced[25]. However, it is

24 A framework for mandatory impact evaluation to ensure well informed public policy decisions, Oxman et al, 2010

25 Evaluation in government, National Audit Office, 2013

still not routinely carried out in practice.

The principle of evaluation being proportionate still holds. Undertaking expensive independent whole-programme evaluations where there is insufficient data to support such an approach would be wasteful. However, discussions for this report found that there is a tendency to opt for large scale evaluations even when lacking sufficient data for them to be robust. Process evaluation and monitoring may provide a more cost-effective and feasible option in many cases[26]. This is one example of why a baseline knowledge of evaluation is essential for all those working in government policy, not simply those directly undertaking evaluation as their core role.

To achieve robust evaluation of major policies the Government may need to take a more realistic view about the need to pilot policies and to build in evaluation measures at the time of policy design. In a complex policy intervention, clear programme outcomes may not emerge for several years and clearly defined monitoring should be a requirement from the outset. It would be irresponsible to proceed over the long-term without building in periodic checks of progress or effectiveness against agreed measures. Further, insufficient planning for evaluation, even at a basic level of setting out quantifiable measures of success, has a knock-on effect to parliamentary scrutiny. "Only once the Government publishes quantifiable metrics of success and a roadmap to implementation of the policies contained within the Plan, will Parliament be able to hold Ministers to account.[27] "

An NAO report found a worrying lack of adequate analysis around alternative options, a plan for monitoring and measuring outcomes, evaluation of potential demand and

26 Review of Government evaluations: A report for NAO, Gibbons, McNally and Overman, 2013

27 The Government's Productivity Plan, House of Commons BIS Select Committee, 2015

estimation of returns on investment in a large number business cases that were rapidly approved in order to take advantage of the opportunity for unexpected additional capital funding[28]. This may not reflect business-as-usual, but it does demonstrate that when stress-tested by political pressure and challenging timelines, robust evaluation can be one of the first things to go. There must be more effective checkpoints in the system that make it increasingly difficult and unacceptable for policies and programmes to be approved or announced without robust evaluation plans in place. This should extend not only to new programmes but be required as part of the reasoning for why a programme, structure, or policy is being changed or discontinued[29].

Recommendation 11: Robust plans for evaluation should be a requirement for business case approval by government departments and should be published.

The NAO has been effective in helping Parliament hold Government to account. The work of NAO led to estimated savings of £1.21 billion in 2015[30], and has involved scrutiny of evaluation. This demonstrates that scrutiny and challenge can be a very effective tool to drive beneficial changes in practice. However, the NAO is focussed on value for money and cost-effectiveness of policies and programmes. Evaluation should include measures of societal, educational, scientific, and other benefits which are currently outside the NAO's remit. Select Committees in the House of Commons and the House of Lords can be a powerful means of scrutinising government activity and

28 Department for Business, Innovation and Skills capital investment in science projects, National Audit Office, 2016

29 All Change, Institute for Government, 2017

30 Annual reports and accounts, National Audit Office, 2016

holding them to account. It could be helpful if Commons Select Committees periodically undertake an inquiry scrutinising evaluation in the departments they monitor.

However, good government should not simply rely on external scrutiny to drive good practice in the use of evidence. There are already departmental structures that provide independent advice. Many departments have an overarching SAC and it would be useful if they had a clearer remit on evaluation. For example, when departments commission evaluation studies, SACs should consider them formally. If they do not have a SAC, departments' evaluation strategies should articulate which body will provide this kind of independent scrutiny of evaluation. There is not an up to date list of councils and committees. In the interest of transparency, it would be helpful if department's websites listed the names of its SACs and SAComs along with primary contact details.

Recommendation 12: The remit of Scientific Advisory Councils should be expanded to include independent scrutiny of evaluation.

Transparency and accountability

Increasing transparency and accountability should help provide a strong incentive to ensure policies are informed by robust evidence and well evaluated. Indeed, the Government recognises it is a key part of gaining and holding the trust of the public to have an open policymaking agenda.

Parliament is the primary means of holding policymakers in government accountable for their decisions and performance. The UK's system of Parliament is set up to provide effective scrutiny of government with the aim of sharpening their activity. The 'evidence check' is a tool that has been adopted by the Science and Technology, and Education Select

Committees and requires a department to publish the evidence base for a given policy. The idea is then for experts outside government to review and comment on the evidence used. As yet, this is relatively unknown and unused by the public. However, this is an extremely helpful prompt for a department to publish the evidence underpinning a policy.

CaSE has previously recommended[31] that when a Committee announces an inquiry, the range of evidence received in the development of the policies in question, should be made available to the Committee and to the public. This would enable inquiries to provide a forum for scrutiny of how evidence has been handled and the strength of the evidence base on which a policy decision has been made, rather than evidence sessions providing an opportunity to set out evidence in the first instance.

However, by the time a Select Committee is scrutinising the evidence base on which a policy is based, the policy will already be enacted. In the interests of fulfilling the government's commitment to transparency and open policymaking, and to help rebuild public trust, government should proactively publish the evidence that was considered in the development of the policy. To limit burden there could reasonably be a given scale or funding threshold below which this principle doesn't apply.

Recommendation 13: When policies are announced, the underpinning body of evidence should also be published.

Publication has always been a key feature of transparency and accountability. And yet, there are concerns about the level of control government asserts over evaluations undertaken by independent bodies or individuals. The

31 Science and Engineering in Government, CaSE, 2014

findings of evaluation studies should be disseminated in an accessible way so they can be useful to people within and outside government. In some areas, there is the expectation that research will be made publicly available within 12 weeks of departments agreeing the final output[32]. However, there are often delays in publication and some reports are never published[33,34].

There could be benign reasons to explain delays. However, it is easier than ever to publish and store data in a way that is accessible to the public, and government should ensure all independent research is published in a timely manner. Independent research should be treated as just that, independent. This research, including commissioned evaluations would be expected to form part of the database of research proposed in recommendation seven.

Recommendation 14: All independent evaluations should be published within 12 weeks from the date of completion.

32 Publishing research in government, Government Social Research Unit, HM Treasury, 2010
33 Evaluation in government, National Audit Office, 2013
34 Missing Evidence, Sense about Science, 2016

Conclusion

As the UK shapes a new relationship with the world, we need to ensure that UK policies are robust and evidence-based. Evidence-based policies better position us to deal with considerable change, more of which is yet to come.

Over the last few years there have been some positive steps towards strengthening the policymaking process. Despite this momentum, we are yet to see scientific advice and evidence, in line with political timeframes, visibly grounding policies in the UK government. This remains an aspiration rather than reality.

Research for the report identified widespread recognition of the value of evidence and the role of different structures for generating and using evidence to inform the development, implementation and evaluation of effective policies. There is acknowledgement and appetite for improving the use of evidence in policymaking in the UK government. The report identifies three key areas in which recommendations have been made: effective science advisory mechanisms to inform policymaking; balancing the demand and supply of evidence; and prioritising evaluation and accountability throughout the iterative policymaking process.

The report provides a timely opportunity to use the recommendations to embed the use of evidence and evaluation in policymaking. CaSE will continue to champion the use of robust and evolving evidence to produce effective and fit-for-purpose policies. CaSE will continue to work with our members, Government, Parliament and the wider science and engineering community to see these changes put into practice to improve policymaking.

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The Advisory Group offered comment, guidance and direction on the report's content. Their contributions were based on their personal expertise and experience. They were not formally representing their organisations. Any errors in the report remain solely the responsibility of CaSE.

CaSE and UCL

CaSE is a strong, independent voice for science and engineering on investment, education and skills, and science advice in policymaking. CaSE wants to see the government taking an increasingly evidence-informed approach to policymaking so that expertise, evidence and knowledge can be better used towards making policies smarter and, ultimately, lives better.

UCL has a strong history of its research engaging with and informing public policy and well-established policy links exist among many centres, departments and faculties. The UCL Public Policy initiative seeks to further enhance such activity through the provision of a number of mechanisms for academic-policy engagement. UCL therefore has a keen interest in better understanding the current barriers to research and public policy engagement and how such engagement can be better facilitated by all stakeholders.

CaSE and UCL undertook a joint programme to fund a policy fellow to research and write this report, in order to provide a sound intellectual basis for recommendations to enhance the use of research findings in the development of public policy. The fellow was hosted at CaSE and worked closely with CaSE colleagues and with colleagues in the Office of the Vice-Provost (Research) at UCL to deliver the project.

The Campaign for Science and Engineering (CaSE) is the UK's leading independent advocate for science and engineering. Our mission is to ensure that the UK has the policies, funding and skills to help science and engineering thrive. We are funded by individuals and over 100 scientific organisations including businesses, universities, professional bodies, and research charities. Collectively our members employ 360,000 people in the UK, and our industry and charity members invest around £35bn a year globally in R&D.

UCL is one of the world's leading universities. Based in the heart of London, it is a modern, outward-looking institution with more than 5,000 academic and research staff. At its establishment in 1826, UCL was radical and responsive to the needs of society, and this ethos – that excellence should go hand-in-hand with enriching society – continues today. UCL's excellence extends across all the breadth of disciplines; from one of Europe's largest and most productive hubs for biomedical science interacting with several leading London hospitals, to world-renowned centres for architecture (UCL Bartlett) and fine art (UCL Slade School).

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