



Science Advisory Council

Annual Report – 1 April 2016 to 31 March 2017

Introduction

This report provides a review of Defra's Science Advisory Council (SAC) from April 2016 to March 2017. It is produced under SAC's openness policy and accounts for its activities in the year.

The SAC is a Non Departmental Public Body (NDPB) which provides independent expert advice and scientific challenge to Defra. The SAC helps guide Defra's scientific priorities and planning, including long-range planning as well as dealing with immediate risks and opportunities. Full details of the responsibility of the SAC can be found on its [website](#).

During the year the SAC has held four principal meetings, six teleconferences and an engagement workshop. Additionally, four sub groups carried out in-depth studies on particular topics. The range of topics discussed by the SAC reflects the issues confronting Defra. Its agenda is structured to integrate it within the Department's workings, whilst retaining its capacity to provide critical challenge. The SAC is both reactive to Defra's needs and raises issues itself that it believes would be helpful for the Department to consider.

SAC continues to strive to be visible and available to Defra, and, without compromising its position as an NDPB, has made clear its role as a resource that can help to improve the quality of the evidence base upon which Defra policy is built. This ambition will continue, and is particularly important at a time when the Defra group is working to join up activities across evidence and policy and will be focussing on delivering EU exit.

The SAC comprises of eight members, including the Chair, Professor Sir Charles Godfray. Full membership details are on the SAC website ([link](#)). In addition, the Defra Chief Scientific Adviser (CSA) and Deputy CSA attend SAC meetings as well as observers from the Devolved Administrations. The SAC secretariat is provided by the Chief Scientific Adviser's Office.



SAC achievements and activities

Conference 'Science for Defra: Excellence in the application of Evidence'

- SAC members were active participants in the joint Defra and Royal Society conference in March 2017 ([link to website](#)). The conference brought together nearly three hundred academics, government scientists and policymakers for an open and collaborative discussion about how science and technology can best inform Defra policy. It covered a wide range of Defra's areas of interest and the application of evidence.
- SAC members chaired and facilitated panel sessions engaging with experts, ensuring the conference met its objectives and positively highlighting the breadth of Defra's portfolio. The SAC Chair, Professor Sir Charles Godfray, gave a keynote speech reflecting upon how evidence is used in Defra and in Government and exploring how external scientists can best engage with policy and Defra. The conference is a clear example of how the SAC members provide a crucial link between Defra and academia.

Throughout the reporting year the SAC has provided advice and challenge on a wide range of issues. The SAC provides immediate feedback on evidence related issues and considers whether some topics need more detailed treatment at a subsequent meeting or through convening a time-limited sub group. Issues discussed by the SAC during the year are described below (work continues on some topics).

Air quality

- The SAC discussed air quality focussing on high level issues such as transport, modelling approaches and uncertainties, challenge across government and engagement with the farming community. Defra's policy has been designed to be adaptive so that robust evaluation of the policy occurs alongside implementation, which allows the policy to be adjusted as necessary. The SAC agreed with this approach and encouraged its use in other policy areas.

Business critical models annual review

- The SAC critiqued the planned approach to the annual review of Defra group business critical models. The SAC agreed to help and provide further advice in the future.



Cattle Bacillus Calmette-Guerin (BCG) vaccine development and injectable badger BCG vaccine availability

- The SAC were asked for advice on the evidence base on cattle vaccine and diagnostic testing. The SAC recognised this as a complex system with significant gaps of knowledge. The SAC advised on various points where further information could enhance Defra's development of this work. Defra is considering these points and the SAC offered to provide further advice as the work progresses.

Cetacean welfare

- Defra has developed a tool to assess the welfare status of animals and to provide an assessment of the severity of certain welfare threats to wild cetaceans (whales, dolphins and porpoises). SAC provided advice to develop and refine the tool to enable global use.

Defra EU strategy

- SAC offered support to the department on the science and evidence challenges in relation to exiting the EU. The SAC have discussed concerns, future opportunities and risks for Defra such as the dependency of UK laboratories on EU funding. Input from the natural and social sciences was considered to be very important in determining high-level policy goals and narratives, as well as helping in the design of specific agricultural and environmental policies and science-led surveillance schemes as they evolve from the Common Agricultural Policy (CAP) and other European legislation. The SAC recognised that whilst the challenges should not be underestimated there are also opportunities, for example, redesigning support for rural communities to obtain multiple public goods.

Defra group areas of research interest

- The SAC discussed the publication of Defra's 'areas of research interest'. This is a summary of the high priority research questions from the Defra group Evidence Plans and a direct response to the recommendations arising from the Nurse Review, on government departments communicating where their research priorities lie.

Environment plan

- The SAC reviewed and discussed the summary framework for the 25 year environment plan. The aim of the plan is to improve decision making to protect and improve the environment. The SAC offered to contribute to the further development of the plan such as the scoping of the evidence needs



and bringing evidence together. In addition they offered to be part of any stakeholder engagement recommending groups and sectors with whom consultation could take place.

Expert Evidence Group review

- The review of Defra's Expert Evidence Group structure examined how Defra accesses external evidence advice through groups and committees. As part of the review the SAC were commissioned to carry out a high-level examination, focussing on strategic issues and principles, for Defra's committee structure in the future. The SAC concluded that once implemented, the new evidence structure will help to deliver high quality, more easily accessible science advice to Defra and provide a route for direct, fluid interaction between the policy and science communities. The SAC report, published in August 2016 ([report](#)) informed the Defra review and influenced the subsequent development of an implementation programme. The SAC continue to engage on the implementation programme.

Food and farming plan

- Defra officials introduced the five principles that will underpin the government's long term approach to food and farming. The SAC discussed the principles and where high level input from the SAC would be most helpful. The SAC made recommendations on evidence issues that should be incorporated in the plan and offered to support further work with constructive challenge.

Great British Food Unit

- SAC was provided with information on the Great British Food Unit. The SAC discussed the key challenges for both the short and long term and raised the importance of strategic investment and planning for food security issues.

Group Evidence Science and Analysis Committee (GESAC)

- SAC received updates on GESAC which was established in November 2016 as the internal Defra science and evidence governance committee reporting to the Defra Executive Committee. Communication was discussed and arrangements put in place between GESAC and SAC to ensure SAC could add value on appropriate topics.

National Flood Resilience Review (NFRR) Science Advisory Group (SAG)

- Professors Godfray and Whatmore formed part of the NFRR SAG communication sub group which led to the SAC discussing the communication of risk to a non-specialist audience. The SAC tasked the SAC



Social Science Expert Group (SSEG) to undertake further work on communicating science advice on risks relevant to Defra but stipulated that this should complement not overlap with the work the Environment Agency is doing in this area. The work undertaken by SSEG will make recommendations and provide advice to Defra on how to communicate complex issues of risk to a non-technical audience.

A number of other topics were brought to the SAC's attention throughout the year. These are detailed in Annex 1.

Sub groups

The SAC establishes time-limited [sub groups](#) on particular topics when more in-depth studies are considered necessary. These are chaired by a member of the SAC and include non-SAC members, co-opted to the sub group, to increase the range of relevant expertise to contribute to the study.

Foot and Mouth Disease Carcass Burial

This sub group, chaired by Professor Heathwaite, was created in March 2016 to undertake a scientific review of the level of risk (biological and chemical) to water quality and biosecurity at sites where livestock were buried during the foot and mouth outbreak of 2011. During the review, the sub group worked closely with the Defra customers and the Environment Agency.

The [report](#) was completed in March 2017 and focusses on the future management of the burial pits and the risk to water quality and biosecurity. The CSA has welcomed the report and confirmed that Defra will consider the report recommendations. Defra has already undertaken some aspects of the report's advice, including synthesising water quality monitoring data for all carcass burial sites managed by Defra and the development of a conceptual model of water quality risk using the Watchtree burial site as the test site.

Data

This sub-group, chaired by Professor Monks, was created in August 2016 to focus on how Defra can become a fully data driven department. The sub group held a workshop in December 2016 to explore "Developing an effective Defra Data Science Function". The workshop stimulated discussion within Defra and is already having an impact on Defra thinking and the way that Defra is managing data policy. Further workshops will be conducted in 2017 to address key evidence questions to assist Defra in the development and underpinning of the overarching strategic direction of the data programme. All workshops will bring together sub group members, external experts and Defra colleagues.



Social Science Expert Group (SSEG)

This is a new sub group, chaired by Professor Whatmore. The SSEG aims to advise Defra to help improve policies and their impact through the effective advice on and use of high-quality social science evidence. Its first meeting was held in November 2016. It replaced the Social Science Expert Panel (SSEP) which had been jointly run by Defra and the Department for Energy and Climate Change. Upon the closure of the SSEP it was agreed that Defra should set up the SAC sub group to ensure it had continued access to external social science expertise.

Exotic Disease (SAC-ED)

The sub group was first formed in 2013, in partnership with Defra's Chief Veterinary Officer, to provide advice, support and challenge in the event of an exotic disease outbreak and to review the evidence and analysis supporting Defra's disease control and recovery phase policies. The sub group, chaired by Professor Wood, is currently undergoing a refresh of both its terms of reference and membership to ensure its continuing relevance to Defra and to provide clarity on the group's role and the situations under which it would be activated.

In December 2016, the SAC Chair attended a Defra table top exercise to examine the UK's capacity to respond to a large scale, cross-border outbreak of Foot and Mouth Disease (FMD). During the exercise, roles for the SAC-ED were identified: assisting outbreak responses by interpreting the various forms of advice which Defra would receive and to provide constructive advice and challenge. It was confirmed that the SAC-ED will be kept informed early on in an outbreak and remain primed to contribute.

Defra/SAC pairing scheme

To support communication and understanding between the SAC and Defra each SAC member is paired with a relevant senior policy official. This provides a safe space to talk through issues. It provides Defra officials with the opportunity to update SAC members on the emerging policy and evidence issues and to use the SAC member as an independent sounding board for informal advice or challenge. The SAC member has an opportunity to update Defra officials on current and future work priorities for SAC and enables the SAC member to develop a detailed understanding of the policy content and associated evidence. Some examples of the benefits of the pairing scheme are highlighted below:

- A closer relationship between Defra and the UK veterinary schools, in relation to both research activities and teaching regarding the Government veterinary services.



- How Defra can improve the regular reporting of air quality official statistics to include measures of uncertainty and additional regional focus.

Representative activities

SAC members are encouraged to use their professional networks and expertise to alert the Department to issues and advances that may affect Defra's evidence gathering and needs. This is captured at every meeting in a discussion on emerging issues. A number of these issues have since been discussed at a meeting or added to the SAC workplan.

The members of SAC contribute more widely to Defra in addition to the routine SAC meetings and sub groups. These are varied and typically relate to the SAC member's expertise. Some of these activities are highlighted below.

- Professors Monks and Godfray were part of a review team providing science quality advice and scrutiny to the air quality technical report accompanying the air quality plan. Professor Monks is also part of an air quality modelling implementation group and Chair of the Air Quality Expert Group.
- Professors Whatmore and Godfray represented the Defra SAC on the NFRR SAG Communication sub group (see above), developing the annex on best practice in communicating flood risk estimates to a non-specialist audience.
- Professors Godfray and Boyd co-chaired a workshop, convened with Government Office for Science, on the Future of Livestock. The workshop brought together experts to consider the questions posed and proposed scenarios that could be explored and potentially modelled.

Closing remarks

The SAC has had a very active year. It has contributed to an extremely broad spectrum of Defra policy areas in a timely way. In the coming year the SAC will continue to work closely with Defra in a collaborative fashion to enhance Defra's ability to deliver effective evidence to feed in to the challenging policy decisions the department faces. The SAC stands ready to contribute informed external perspectives and advice to the development of plans for the many Defra policy areas which will require ambitious thinking in light of the decision to leave the European Union.



Annex 1: Overview of issues brought to SAC's attention during the reporting year

The following topics were brought to the SAC's attention throughout the reporting year by either Defra or SAC members. It should be noted that this is a retrospective list and as such comments and policy may have moved on since the discussions took place.

- The CSA updated SAC on Defra's thinking and position regarding the use of microbeads. The Air Quality Expert Group will be publishing a report on nanoparticles. The SAC agreed to keep abreast of changes in the views on risks associated with nanoparticles.
- The new Environment Analysis Unit (EAU) has been looking to develop modelling across the department. The SAC were notified of a potential advisory role for SAC on the types of modelling available and how these can be applied to Defra's work.
- The National Farmers Union re-applied for a limited emergency exemption for neonicotinoid application. This was considered by the Expert Committee on Pesticides.
- The CSA reported that badger culling would continue in 2016. The SAC were informed on, and critiqued, the evidence and assumptions underpinning aspects of badger culling.
- The CSA reported that the Defra Earth Observation team is taking a lead role in building cross-government capability on earth observations. The SAC offered to provide advice, specifically on strategy and functionality.
- Issues were raised about the UK's TSE surveillance statistics.
- The SAC was briefed on Avian Influenza (bird flu) outbreaks throughout the reporting year.
- The CSA reported on a review of the Natural England Paper on High Speed 2 (HS2) and potential biodiversity loss. The CSA considered there could be value in involving SAC in future discussions regarding tools for offsetting biodiversity or habitat loss particularly in relation to large scale future infrastructure projects.
- The SAC were updated on the Foresight Future of the Seas report.



- The UK Climate Projects UKCP18 Governance Group is chaired by the Defra CSA. SAC was updated on the changes to farming practices that will be required over the coming decades to meet the future targets on reducing emissions.
- The SAC was informed about the broad range of pollutants in the environment and the impact on Defra soil policy.
- The SAC was kept up to date on EU exit work across Defra. The SAC offered support on issues relevant to science.
- The SAC was informed about the Natural Capital Committee (NCC) launch of the fourth state of natural capital report and how it contributes to the Defra evidence base.
- The SAC was asked to share information in relation to insect protein production and insect bioreactors
- The CSA reported on the third annual Waste to Resource Productivity report which he co-authored with the Government's CSA, Sir Mark Walport.
- The SAC was informed about the UK Science Partnership for Animal and Plant Health.
- The SAC considered whether it would be useful to study the governance structure of environmental regulations in different countries to contribute to thinking on how Defra may develop environment regulations following EU exit.
- The Welsh Assembly observer reported that Wales is working with the Research Councils to develop a systems based approach to environmental monitoring.