The ASC
Animals in Science Committee

The Future of Futures

Participatory Futures Research in the Animals in Science Committee

Futures Working Group

December 2022

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1. Introduction

The Animals in Science Committee (ASC) is an advisory, non-departmental public body that was established in 2013 by the Animals (Scientific Procedures) Act 1986 as amended[1] to provide independent advice to the Home Office, both in response to matters referred to the Committee by the Secretary of State, and in relation to matters the Committee may determine.[2] It is in this context that the Home Office asked the ASC to undertake futures research in order to gather systematically a diverse range of perspectives, expertise, and insight.[3] The Futures Working Group (FWG), as a sub-committee of the ASC chaired by Professor Johanna Gibson, was established in 2020 in order to manage this task of analysing the trends, drivers and uncertainties as relevant to the work of the ASC. The group was established for an initial period of one year, subsequently renewed for a second, with a view to exploring the potential for futures research as a regular part of the ASC's work programme.

Why Futures Research?

Futures research is a foresight tool that utilises a range of robust methodological practices towards preparedness and adaptability in the face of increasing complexity and uncertainty.[4] Futures research is particularly notable for three key qualities: (1) whole world systems analysis; (2) global outlook; and (3) engagement and dialogue.

First, futures research examines a particular area as part of a whole world system. This means that futures research gathers evidence from a wide range of sources and perspectives, rather than limiting input to specific areas of expertise or disciplinary focus. This emphasis on the interconnectedness of diverse actions and influences is crucial to analysing complex and uncertain futures. Futures methods engage novel scenarios and alternative futures in order to address otherwise unanticipated issues and factors. Importantly, the whole system approach of futures research is interdisciplinary and cross-sectoral, thus facilitating a greater diversity and inclusivity in the gathering of views towards future preparedness.[5]

Second, futures research is global in nature. This global outlook provides the necessary resources to adapt and respond to the uncertainty and complexity of international research and innovation landscapes, and the potential legal and ethical precarity for the protection of animals in science that may result from international collaboration, commercialisation and trade.

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[1] Section 19, Animals (Scientific Procedures) Act 1986 as amended to comply with Directive EU 2010/63/EU, entering into force 1 January 2013.

[2] Animals (Scientific Procedures) Act 1986, section 20(1).

[3] ASC Futures Capability, ASC 24 16.09.2019.

[4] See further: Frith D & Tapinos E, 2020. Opening the 'black box' of scenario planning through realist synthesis. Technological Forecasting & Social Change, 151, 119801; Floyd J, 2012. Action research and integral futures studies: A path to embodied foresight. Futures, 44, 870-882; Heino H & Hautala J, 2021. Mobile futures knowledge: From research policy to research and public policy? Geoforum, 118, 83-92; Gordon TJ et al, 2005. Frontiers of futures research: What's next? Technological Forecasting & Social Change, 72, 1064-1069.

[5] Ahlqvist T & Rhisiart M, 2015. Emerging pathways for critical futures research: Changing contexts and impacts of social theory. Futures, 71, 91-104.

Third, futures research is a resource of participation and co-creation. It is a critical tool for building capacity for engagement and continuing dialogue, both in terms of contributing information as well as accessing and evaluating outcomes and resources. As such, an ongoing futures research programme has the potential to become part of the broader "feedback" framework for the protection of animals in science and to provide for societal input in policy and decision-making, as well as transparency and trust in the process itself.[6] The establishment of a futures programmes also contributes to a culture of critical thinking and reflection in the work of the ASC, embedding a culture and behaviour of outreach, reflection and interdisciplinarity in advice and best practice.

2. Methodology and Results

A range of methods is available to futures research.[7] For the purposes of the present research, the following work programme has been completed:[8]

1. 7 Questions Interviews;[9]
2. Issues Paper (prepared following the data collected from the interviews);[10]
3. Horizon Scanning (to date, 53 scans have been collected and analysed);[11]
4. Gap Analysis in the current data;[12]
5. Axes of Uncertainty[13] and Driver Mapping;[14] and
6. The identification of "worlds" for the preparation of future scenarios (based upon the analysis of all the data).[15]

Seven Questions

The 7 questions technique is a semi-structured interview technique that is used for gathering insight from a range of internal and external stakeholders. The Home Office Futures Team interviewed the ASC members and then undertook 15 external interviews in order to gather a range of perspectives on the future in relation to the following questions:

1. What would you identify as the critical issues for the use of animals in science in the future?
2. Being optimistic but realistic, talk about what you see as a desirable outcome for the use of animals in science in the future.

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[6] Piirainen KA et al, 2012. A systemic evaluation framework for futures research. Futures, 44, 464-474.

[7] Government Office for Science, *The Futures Toolkit: Tools for Futures Thinking and Foresight Across UK Government*, November 2017, The Futures Toolkit: Tools for Futures Thinking and Foresight across UK Government (publishing.service.gov.uk)

[8] For the results of each exercise in the course of the present research, please visit the Annexes to this report.

[9] Ibid, pp 29-32; 81-82.

[10] Ibid, pp 33-34; 83-34.

[11] Ibid, pp 26-28; 79-80.

[12] The operation of a gap analysis in this context reinforces the need for regular horizon scanning and the analysis of that intelligence through an iterative approach to futures preparation: Jennings MD, 2000. Gap analysis: concepts, methods, and recent results. Landscape Ecology, 15, 5-20. See further Frith D & Tapinos E, 2020. Opening the 'black box' of scenario planning through realist synthesis. Technological Forecasting & Social Change, 151, 119801.

[13] Government Office for Science, *The Futures Toolkit: Tools for Futures Thinking and Foresight Across UK Government*, November 2017, pp 46-49 The Futures Toolkit: Tools for Futures Thinking and Foresight across UK Government (publishing.service.gov.uk)

[14] Ibid, pp 42-45; 85.

[15] Ibid, pp 50-56; 86-89.

3. If things were to go wrong, what factors would you worry about most?
4. Looking at your organisations internal systems (or other key organisations), how might these need to be changed to help bring about the desired outcome?
5. Looking back, what would you identify as the significant events which have had an impact on the use of animals in science?
6. Looking forward, what do you see as priority actions which should be carried out soon to reach the desired outcome?
7. If you had absolute authority and could set the direction of the use of animals in science, is there anything else you would do?

Key quotes were then extracted and thematically organised in order to create the Issues Paper. This tool provided us with a clear record of the issues arising in those interviews, as well as the opportunity to identify emerging themes. In total, 24 different themes were identified, each coming with a range of issues raised within it. The full issues paper is available at Annex 1.

Horizon Scanning

Horizon Scanning is a systematic evidence-gathering exercise that is useful for identifying and tracking emerging issues, potential threats, risks and opportunities that may have a future impact in a particular policy area.[16] As a tool, Horizon Scanning contributes to building a longer-term strategic approach to policy-making, particularly in anticipating future threats, thus providing for greater adaptability and resilience in the face of future uncertainty and systemic risk.[17] While Horizon Scans will focus on issues with a range of timeframes, from short to long-term, the main focus for futures research will be the medium to long-term issues. The majority of the Scans collected in the present research identified the issues as short to medium-term, which may suggest clearer guidance is needed for Scan authors. However, these Scans are nevertheless still useful in accounting for public attitudes and were relevant to feed into the existing themes.

In December 2020 the FWG Chair approached 44 organisations and invited those organisations to identify representatives to contribute Horizon Scans on any issue of their choice related to animals in science. Organisations were also invited to identify representatives who would be available for interview and to participate in a workshop with all the interviewees and Horizon Scan authors at a future date. Potential Horizon Scan authors were provided with some basic background information on preparing scans, as well as a suggested template as follows:

- A short summary of the topic
- Benefits, challenges and threats
- Main factors/drivers
- Implications for the ASC
- Certainty (where 1 = highly unlikely and 5 = highly likely)
- Timescale/horizon (short = 0.5 years; medium = 5-10 years; long = 10+ years)

[16] Garnett K et al, 2016. Integrating horizon scanning and strategic risk prioritisation using a weight of evidence framework to inform policy decision. Science of the Total Environment 560-561, 82-91.
[17] Ibid.

The FWG approached representatives of organisations in order to encourage responses from a wide range of participants within those organisations, not just senior or established individuals in identified fields. Organisations were identified across a wide range of interests and perspectives, from research and industry to policy and commercialisation, to education and animal advocacy. While it was necessary to identify specific entities at this early stage of futures research in the ASC, if futures research were to be included as part of the ongoing work programme, it is hoped that a facility could be created for anyone to submit Horizon Scans at any time, simply by visiting an online portal and completing the Horizon Scan template. It is hoped that this kind of facility would maximise engagement with the process by simplifying and streamlining the process, and at the same time ensure an inclusive system for motivating a wide and diverse a range of feedback.

A total of 53 Horizon Scans were submitted and these were summarised and collated to generate a slide deck for distribution to all workshop participations (Annex 2). Scans on similar topics were reconciled to form single Scans where appropriate, resulting in a total of 43 topics overall, as organised within the seven (7) themes in Figure 1. The FWG discussed the themes and grouped the Scans accordingly in preparation for the workshop analysis. The seven main themes were identified as follows:

New Approach Methodologies (NAMS)	Horizon
Neural Organoids	Short
Animal-free antibody production	Short
Next Generation Risk Assessment	Short
Use of data, digital and computational models	Short-Medium
Innovation new Therapies and Modalities	Short-Medium
Public Health and Economic Benefits of Accelerating Progress Towards Uptake of NAMS	Short-Medium
Artificial Intelligence/ Increasing Digitised world	Medium
NAMS for Safety Decisions on Chemicals	Medium
Personalised Medicine	Medium
Drug Development Crisis	Medium
Validation of NAMS for use in Medical Research	Long
UK Policy in an International Context	
Post-Brexit Challenges and Opportunities	Short
Rapid Progress in the Netherlands on Reducing Animal Experiments	Short
Brexit and Free Trade Agreements (FTAs)	Short-Medium
UK Duplication Issues	Medium
Preclinical/Toxicological Regulatory Issues	
Increase in Household Product Testing	Short
Pre-clinical Testing of Novel Medical Devices using Large Animals	Short
Project Licences for e-cigarettes as medicinal products	Short
Second Species Testing	Medium
Societal Concerns	
Mental Health	Short
Ethical Consumerism	Short
Culture of Care	Short
Section 24 and Transparency	Short
Review of Membership Profile of the ASC	Short
From Societal Concerns to Societal Contributions	Short-Medium
Public and Political Interest in a “Phase Out” Programme	Short-Medium
Thematic Review	Short-Medium
Increasing Public Concern about the Use of Animals in Research	Medium
Unsustainable use of Primates and Dogs	Medium
Sentience	
Decapods	Short
Sentience	Short-Medium
Climate Change	
Sustainability	Short-Medium

Global Food Sustainability	Short-Medium-Long
De-Extinction	Medium
Can Anaesthesia Go Green?	Medium
Pollution and Health	Medium-Long
Issues Affecting Establishments	
Use of gene altering technology	Short
Animal Research at Places Other than Licensed Establishments (POLEs)	Short-Medium
Transport and Supply of Animals	Short-Medium
Veterinary Retention	Short-Medium
Heterogeneity	Short-medium
Complexities of GA/GE creation and subsequent incorrect/overbreeding	Medium
Increased Automation in the Management, Housing, Care and Welfare of Laboratory Animals	Medium

Figure 1: Horizon Scans and Thematic Analysis

Workshop – Gap Analysis, Axes of Uncertainty and Driver Mapping

All stakeholders who submitted evidence were invited to a workshop, conducted via Microsoft Teams, 29 July 2021. Twenty (20) external contributors to the futures research attended.

The workshop was also attended by the FWG (as observers, facilitators and scribes), the Home Office Futures Team, and the ASC Secretariat and members, attending as observers only. The FWG Chair facilitated the Plenary discussions. Also in attendance, and strictly as observers only, were members of the Animals in Science Regulation Unit (ASRU). Members of ASRU had the opportunity to clarify certain aspects or questions from participants as they arose but did not participate formally in the gap analysis and driver mapping.

Participants in the workshop contributed to key stages of the futures scenarios development, including: a preliminary review of the horizon scans and thematic analysis; a preliminary gap analysis of the scanning exercise; identifying drivers and assessing the importance and uncertainty of different drivers; and undertaking driver mapping, which forms a significant part of the later scenario writing.[18]

Groups were allocated specific themes to focus on throughout the workshop. Each group then completed 3 main exercises:

1. Gap analysis;
2. Axes of uncertainty
3. Driver mapping and identification of top drivers.

Gap analysis

For the gap analysis, workshop groups were asked to review the 7 themes and consider if there were any themes missing. The workshop identified 11 potential additional themes:

[18] Wilson L, Ralston B, 2006. Scenario Planning Handbook: Developing Strategies in Uncertain Times, South-Western, Mason OH. See further Frith D & Tapinos E, 2020. Opening the 'black box' of scenario planning through realist synthesis. Technological Forecasting & Social Change, 151, 119801.

- Intellectual property / patents
- Data sharing and open data
- Increased innovation and link with welfare
- Development of new drugs and treatments for animals (research in context of veterinary medicine)
- Future pandemics and pandemic preparedness
- Public perception of science
- Funding changes
- Transparency, openness and accountability
- Animal-focused technologies
- Virtual technology education
- Audits and competency assessments

Groups were also asked for any specific scans which were missing from the initial 7 themes, resulting in the following suggestions:

- Criteria used to define sentience and keeping these updated
- Education and training changes, assessing competency
- Pandemic preparedness – disaster planning
- Climate / environmental implications of all scientific methods – animal research and NAMs
- How to measure climate impact
- Framework for managing legislation
- Developing a roadmap
- Asking the public what their concerns are in a sympathetic way
- Outsourcing of research to China
- Varying quality control[19] on publication of scientific papers.

Axes of Uncertainty

The workshop groups were then asked to map the issues identified through the Horizon Scans on an importance and uncertainty matrix. This was aimed at identifying the following (see Figure 2):

- Issues which require action (top left)
- Issues which require scenario-planning (top right)
- Issues which can be parked (bottom left)
- Issues that require tracking (bottom right)

[19] The topic of quality control in scientific publications includes, among other things, peer review (which may also be blind or anonymised) and other specific procedures (such as documentation of ethical approval), as well as wider considerations such as data protection and exclusivity, the impact of predatory journals, and the potential for harmonised approaches.

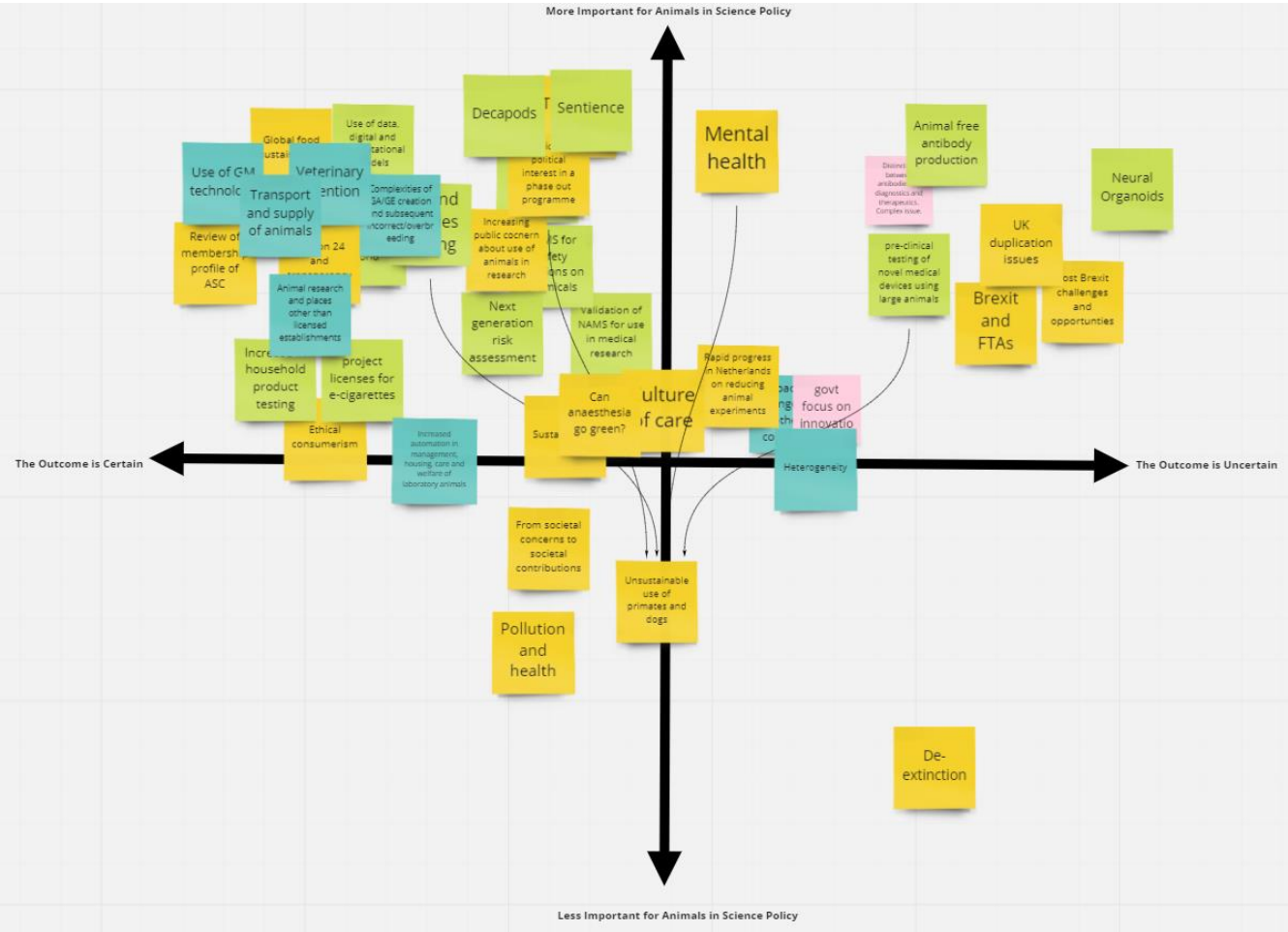

Figure 2: Driver Mapping Exercise – Futures Workshop, London 29 July 2021

Driver-mapping

The data gathered in the driver mapping exercise is available in full in Annex 3. The majority of scans were categorised as "issues requiring action" and "issues requiring scenario planning". The groups were then asked to identify their top three priority drivers, which resulted in the following list:

1. Post-Brexit UK
2. New approach methodologies (NAMs)
3. Data access and use
4. Thematic review and interest in a phase-out programme
5. Sentience – scope and implementation of legislation, public concern, and future developments
6. Genetic technologies – increasing applications, as well as management and training uses
7. Ethical and practical issues relating to the supply and transport of animals for use in research and testing in the UK

The categorisations of the scans together with the data collected through the priority driver mapping exercises were then analysed in order to identify the five "worlds" that are proposed as the basis for the scenarios development (Table 1).

Scenarios

Scenarios are a significant resource arising from futures research and are a widely accepted and versatile policy tool. They are a broader and more holistic foresight tool that allows for a much more diverse and wide range of interactions than that which might be anticipated through traditional policy tools. Scenarios are not predictions for the future, nor are they solutions, but as a foresight tool they assist in preparation and a degree of control[20] through the development of multiple futures.[21] As such, they are a critical policy tool for ensuring that this wider, interconnected approach informs the policy-making process[22] and international research environment.[23] Although at this stage in the present research the scenarios have not been developed fully, nevertheless the worlds have been identified, with the main drivers for each world set out in full. This preliminary scenario development is provided here in order to understand the next stage of this research and the foundations for the building of scenarios. Using the data gathered during all early stages of the futures research, together with the categorisation of the issues and the mapping of the priority drivers undertaken in the workshop, the following "worlds" have been identified.

1. Animal welfare (*a scenario where animal welfare is the main driver*)
2. Technology and Innovation (*a scenario where technology is the main driver*)
3. Commercial and Market (*a scenario where commercial outcomes are the main driver*)
4. Society and Ethics (*a scenario where societal concerns are the main driver*)
5. Global (*a scenario where globalisation and geopolitics present the main driver*)

From the research and data collected, it is then possible to build scenarios for the future of animals in science in anticipation of these five worlds (and priority drivers). There is overlap between issues that may arise within different scenarios, and therefore such issues will arise for consideration in relation to different drivers; for example, climate and sustainability, animal welfare, patents and data access, etc. Not only is this overlap inevitable between these interdependent worlds, but also it is important and even invaluable in that this provides the opportunity for the same issue to be framed quite differently when viewed through different scenarios. Scenarios-building thus provides the tools necessary to consider an issue from a range of perspectives and to answer questions that may otherwise go completely unasked. As such, the five worlds from which the five scenarios will ultimately be developed should be considered and utilised as a set of interdependent, interconnected, and contrasting implications. Taken together, they provide a comprehensive framework for analysing future policy for animals in science.

[20] Elsawah S et al , 2020. Scenario processes for socio-environmental systems analysis of futures: A review of recent efforts and a salient research agenda for supporting decision making. Science of the total Environment 729, 138393. See further Amer M et al, 2013. A review of scenario planning. Futures 46, 23-40.
[21] Amer M et al, 2013. A review of scenario planning. Futures 46, 23-40.
[22] Andersen PD et al, 2021. Stakeholder inclusion in scenario planning: A review of European projects. Technological Forecasting & Social Change 169, 120802.
[23] Haegeman K et al, 2017. Evaluating foresight in transnational research programming. Technological Forecasting & Social Change 115, 313-326.

Initial work on understanding the context in which the scenarios may be developed is set out in the next section. This is an interim step, but it is an important milestone in anticipation of the building of scenarios in the next stage of research. The questions within each of the five "worlds", as understood by the priority driver for each world, are those arising specifically out of the futures research and the workshop data. They should not be interpreted as a prediction or position on the future. Rather, they are the result of the data gathered as part of this research exercise. The output of this futures research is the tool itself, not particular recommendations or predictions.

Table 1

Futures of Animals in Science (2035)				
Animal Welfare	**Technology and Innovation**	**Commercial and Market**	**Society**	**Global**
Animal welfare as dominant driver	**Technology and innovation as dominant driver**	**Commercial outcomes as dominant driver**	**Societal concerns as dominant driver**	**Geo-politics as dominant driver**
Developments and understanding in animal welfare, animal behaviour, cognitive ethology, and sentience	The wider regulatory and legal landscape for technology and innovation, including incentives for research, intellectual property, and the potential role of technology and innovation for welfare developments	The commercial context and the impact on regulation, including competition, intellectual property and data, and other market forces	Societal trust, perceptions of transparency and accountability, and public attitudes to the use of animals in research	The international research environment and how welfare and innovation might be assured in an international context
Key Questions				
How can developments in animal behaviour, sentience and welfare be accounted for through regulation?	What incentives are available for further research, development and commercialisation, and adoption of non-animal technologies (NATs) and new approach technologies (NAMs)?	What impact might the commercial environment and economic and market priorities have on existing laws and regulation?	How can the public play an informed role in helping to shape UK policy and standards?	In post-Brexit UK, what are the opportunities and challenges for the UK to set standards in Europe and internationally in relation to animals in science, NATs and NAMs?
What is the role of the wider research, regulatory, and legal frameworks and the interaction with research	What is the role of funding bodies in setting standards for animals in science?	What are the commercial incentives and barriers to the adoption of NATs and NAMs in testing and research?	What is the level of public engagement and interest in thematic review and a phase-out programme?	Does the outsourcing of research to other jurisdictions affect the welfare of animals in science?

practice (e.g., patents, funding, reproduction etc)?				
What is the welfare impact of increased automation in the management, housing and care of laboratory animals?	What are the incentives and barriers to adoption of animal-free methods of antibody generation?	What is the potential commercial impact of ethical consumerism?	What is the impact of sustainability and climate change on public attitudes to science, innovation and animals in science?	What are the ethical and practical issues relating to the supply and transport of animals for use in research and testing in the UK?
What are the ethical and welfare risks relating to supply and transport of animals in science?	What is the impact of increasing application of genetic technologies?	What is the effect of animal research regulation on the commercial research sector in the UK?	What is the relationship between animal research and public health, including benefits and risks (e.g., zoonoses), and the uptake of NATs and NAMs? (One Health/One Welfare)	What is the potential role of publishers and intellectual property in complementing an international approach to welfare standards?
How does the regulation of the access and use of data affect the potential for digital and computational models as alternatives to animal models?	How does the regulation of data access and use impinge upon innovation?	What commercial incentives and disincentives affect the sharing of data and what is the impact of data access and use, and the regulation of and restrictions to access?	What are societal concerns around transparency and accountability in scientific research and how might these be addressed? How might the composition of the ASC and engagement with lay members contribute to increased	What is the value of looking to other jurisdictions and the progress on reducing the use of animals in research (e.g., the Netherlands, the United States etc)?

			social governance of research?	
How does a culture of care drive normative change in the environment for animals and researchers (may include One Welfare)	How might new developments or understanding demand the need for clarification and reform of the regulatory environment? (e.g., sentience research, neural organoids, de-extinction)	How might the wider commercial environment (e.g., training and management) interact with regulatory frameworks to improve safety and welfare of both animals and humans?	What is the interaction between the use of animals in science and societal concerns for sustainability and climate change, and how might this be addressed through regulatory reform? (includes also discussions of ethical consumerism)	How might the risks and opportunities of international research be addressed through the domestic regulatory framework?

By way of illustration, in using this interim tool, the questions arising in relation to the five worlds as applied to a regulatory context might direct the policy-maker to consider, for example, the following:

Table 2

Is the current regulatory landscape for animals in science effective in delivering animal protection?	**Does the regulatory landscape for animals in science need to adapt to technological advancements and innovation, including in non-animal alternatives?**	**Is the regulatory landscape for animals in science conducive to commercial investment?**	**How can the regulatory landscape for animals in science reconcile public and private interests, and address ethical and moral dilemmas raised by the use of animals in science?**	**How can the regulatory landscape for animals in science influence the system for animal research in Europe and internationally?**

3. Scenarios Building and Future Work

The next stage of the work, which is yet to be done, is to build the scenarios that may be imagined for each of these worlds. The scenarios are holistic tools for flexible, adaptive, and anticipatory policy-making. A scenario may present an alternative future, or a quite different or even aspirational world. It is this unfettered thinking in scenario-building that, while still a plausible, causal analysis, facilitates the identification and answering of what may remain otherwise unimagined and unasked questions. As a policy tool, scenarios are a resource for exploration, allowing for the testing of alternative virtual worlds and hypothetical outcomes in order to assess the strengths and weaknesses of policy and strategy in those different worlds.

The scenarios are also a tool of public dialogue and a resource for building shared understanding. A lot of the truly valuable work of futures research is in facilitating that dialogue and the active engagement of the public and other stakeholders. This potential for futures research to encourage a consistent societal input to policy is a crucial aspect of this work. The potential for a permanent futures programme to become part of the broader and indeed reciprocal "feedback" framework for animals in science is significant and would contribute directly to achieving wider societal governance in this complex policy area

4. The Future of Futures in the ASC

The ASC is considering this work going forward and this report identifies three themes to guide that work: (1) futures research at the Committee level; (2) public engagement and information-gathering mechanisms at the Policy Unit level; and (3) knowledge exchange and public dialogue at the inter-departmental level.

In taking forward these three themes, the FWG directs attention to the following measures, in particular:

1. For consideration of the ASC, the establishment of futures research as a standing sub-committee;
2. For consideration of the Policy Unit, the establishment of a dedicated online portal/resource for the ASC futures work; and
3. For consideration of wider inter-departmental working, the various ways and means of establishing a "safe space" for discussion between various interests, researchers, stakeholders, and the public.

It is the view of the FWG that attention to these three themes will strengthen social input into this policy space and enhance the resources for social governance in animals in science. These three proposed programmes of action within these themes are explained in more detail below.

1. *Futures as part of the regular ASC work programme*

The ASC is invited to consider the possibility of establishing the FWG as a standing sub-committee of the ASC and futures research as a regular part of the ASC work programme. This work would be an instrumental part of building and maintaining

significant resources for policy makers as well as ensuring the ongoing participatory approach to social governance in animals in science more widely. As such, futures work would offer an invaluable policy resource and would complement policy work more widely as part of the Change programme. This would also enable the FWG to continue the work already in progress towards the development and writing of more comprehensive scenarios. The scenarios would be developed as crucial policy tools at an especially critical time in research and international governance.

2. *The Futures portal/resource*

As part of this regular work, the ASC is invited to consider mechanisms for facilitating public engagement and providing stakeholders with an information gateway and toolkit. For example, the establishment of an online portal to the work of the FWG, would demonstrate a commitment to the participatory nature of this research, its transparency, and its accessibility. This area would provide resources for the public and stakeholders to continue to contribute to the futures work through the provision of an online toolkit of submission mechanisms and resources. Materials could include the various tools for contributing to the futures work, such as online templates/forms for preparing Horizon Scans, thus facilitating the iterative dialogue that is widely recognised as a particular strength of futures research.[24] This area would also publish occasional data where possible (e.g., new Horizon Scans or summaries) as well as regular reports.

3. *The Futures Safe Space*

A further need identified by participants in the futures research is for workshops and other events to assist the brokering of productive dialogue between the public, researchers, industry, policy-makers, and other stakeholders. This includes facilitating communication between groups that might otherwise be impossible, through providing for that communication within a third or safe space. Potential strategies could include town hall style meetings, focused workshops on particular issues, and public-facing research presentations. This theme is relevant and significant for broader inter-departmental working, and the ASC is invited to identify and consider potential options for providing this kind of space for constructive dialogue and building shared understanding, as part of wider discussions within the programme of ways of working.

5. Conclusion

The active contribution from people from hugely diverse perspectives on animal research, especially during a particularly challenging time during the onset of the pandemic, is a testament to the importance of this work, and the success of the first futures workshop shows the appetite for this kind of interdisciplinary platform for discussion and analysis of the issues. The particular significance of futures research is that it is a participatory process – impossible without public engagement and invaluable precisely because of it. To embed this participatory culture in the permanent work of the ASC would be a significant achievement for the FWG.

[24] Frith D & Tapinos E, 2020. Opening the 'black box' of scenario planning through realist synthesis. Technological Forecasting & Social Change, 151, 119801

6. Annex 1 – Issues Paper

Attached separately.

7. Annex 2 – Horizon Scans

Attached separately.

8. Annex 3 – Workshop Mapping Data

Attached separately.