



Enabling global
conversations
on the ethical
issues raised by
discovery science

Annual Report

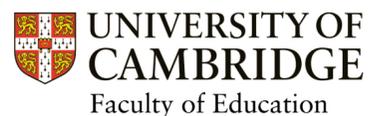
YEAR 2

1st Jan - 31st Dec 2023 Cambridge

Kavli Centre for Ethics, Science, and the Public
Faculty of Education, School of Humanities and Social Sciences
University of Cambridge
Cambridge, UK

Annual Report Year 2
1st January - 31st December 2023

Our new brand identity uses curved shapes to represent the concepts of 'connecting' and 'bridging' with an abstract representation of joined human figures.



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Overview from the Director



Director, Anna Middleton and Deputy Director, Richard Milne

It has been an incredible second year of the Cambridge Kavli Centre. Richard Milne, as Deputy Director and myself are thrilled to

launch our annual review with a summary of the awards and honours we have received in 2023.

Award for Collaboration

The Vice-Chancellor of the University of Cambridge selected us to receive the Research and Impact Engagement Award for Collaboration. This recognises **collaborative partnerships** which lead to “outstanding achievement, innovation and creativity in devising and implementing ambitious engagement and impact plans which have the potential to create significant economic, social and cultural impact from, and engagement with, research”.



Kavli Centre and Connecting Science staff at the VC award ceremony

The focus of the award was on the **network** we created for the delivery of Connecting Science's citizens' jury on germline embryo editing in 2022 and the Kavli-funded cinema event in 2023 for members of the public, patients, policy makers, scientists, health professionals, creatives and our local Member of Parliament.

We led the cinema event which premiered the documentary film Connecting Science had made on embryo editing called 'In our Lifetime'. And we hosted an audience discussion on how to disseminate the juror's policy recommendations through Parliamentary discussion of the Human Fertilisation and Embryology Act.



Kavli funded event at the Arts PictureHouse cinema in Cambridge



Introducing the policy debate on embryo editing at the cinema

In addition to this, 'In our Lifetime' has now premiered at 7 film festivals in Europe and the USA and so the jurors' policy

recommendations on the future of embryo editing have now been viewed across diverse public audiences around the world.



Government Recognition for Contribution

In November 2023 two of our group received a wonderful surprise invitation to No 10 Downing Street, London, the home and office of the British prime minister to celebrate the first 10 years of genomic medicine services in the National Health Service (NHS). As the only two genetic counsellors and public engagement experts to be invited, Sasha Henriques and I were excited to be recognised for our contribution to NHS policy on consent for genetic testing, the Social Contract between patients and providers, the ethical implications of genomics for future technologies, how to



Outside the infamous 'No 10' front door where the UK prime minister lives and the cabinet meetings for government happen

deliver novel public engagement methods and how to deliver equitable, diverse and inclusive practices for genetics patients.

While the honours and recognition are wonderful, our priority is the day-to-day work and building on the solid foundations we laid in 2022. We have been reflecting on how we operate, particularly within scientific environments unfamiliar with either social science or engagement practices. And the methods needed to build confidence, over time, with communities of both scientists and publics so that dialogue can happen at the right time and also at the right pace.

The Culture of Science

Year 2 has firmly grounded us within the culture of science and the lived experiences of scientists and members of the public. This challenges us to explore how we inspire a 'willingness to engage' in others (e.g see Abbey Lab project and the Hopes and Fears Labs on pages 33-44), how we emotionally prepare both scientists and publics for discussing ethics (e.g. see Collaborative Futures Academy outputs on page 14) and the most effective methods for gathering evidence (e.g. our in-depth quantitative and qualitative research on pages 23-32) that will help us create an environment that fosters authentic conversations with lasting impact.

We have been deliberating how to enact inclusive and equitable approaches to working. Firstly, from within the Kavli Centre team – ensuring that we have a work environment that is inclusive, diverse and all voices are heard; and secondly, from within the activities, events and research that we deliver – ensuring that we are engaging with a diverse mix of perspectives in the design of our work as well as the audience participation in it.

As detailed in original grant application and indexed in the legal contract with the Kavli Foundation, the Kavli Centre for Ethics, Science, and the Public was scoped as “a unique collaboration between the University and Wellcome Connecting Science. Together, the University and Wellcome Connecting Science will deliver a vision of innovative public engagement methodologies across a broad spectrum of scientific domains.”

We thus remain indebted to the outgoing Director of Wellcome Connecting Science, Professor Julian Rayner and previous Director of the Sanger Institute, Professor Sir Mike Stratton, for allowing us to build on, extend and radiate the impact of Wellcome funded work with new audiences, methods and academic thinking via the Kavli Centre.

“We recognised there is a pressing need to specifically fund and support public engagement and research around ethics...and it would be of enormous value to join with the University of Cambridge to create a critical mass of multidisciplinary experts in this field”.

Professor Sir Mike Stratton, previous Director of Wellcome Sanger Institute, letter of support for our Kavli Centre

Matched Funding Success

2023 has been an exciting year in that we have successfully obtained our Centre's matched funding; and we have delivered this 3 years ahead of schedule.

Firstly, we were awarded a £480k strategic grant from the Isaac Newton Trust. What is so exciting particularly about this is that it offers support for our two post-doctoral research associates, who can now use the additional title Isaac Newton Trust Fellow and draw on the academic and professional support that fellows receive at the University.

Secondly, as we offer academic training and supervision for Wellcome Connecting Science funded students, we are able

to put forward the £529k from Wellcome Connecting Science and the Wellcome Sanger Institute that goes directly to the University of Cambridge for doctoral fees and stipends for our shared PhD students.



Gratitude to the additional funding bodies who support the Kavli Postdoctoral Associates and Doctoral Candidates



The Kavli team: Catherine Galloway, Richard Milne, Daniela Boraschi, Sasha Henriques, Lydia Okoibhole, Jerome Atutornu, Mariam Rashid, Claudette Burch, Anna Middleton

for delivering public engagement about ethics of science, nor a specific method that is known to encourage engagement from groups that have historically felt (in terms of perception) and been (in reality) excluded from scientific research.

The review also demonstrated that, certainly in the UK, the published literature presented engagement as largely isolated case studies showing ‘what we did’ as opposed to ‘why?’ We also found no evidence for a group of academics, repository or even university that takes a leadership role in collecting, building, and evolving the evidence-base for genuine and authentic conversations that empower scientists to



PhD Doctoral Candidates: Jerome Atutornu, Lydia Okoibhole, Sasha Henriques

Our Team

In 2023 we secured a full complement of staff: three part-time leaders (Anna Middleton, Richard Milne, Catherine Galloway), one part-time administration lead (Claudette Burch), two full-time postdoctoral associates (Daniela Boraschi, Mariam Rashid), and three PhD students (Jerome Atutornu, Sasha Henriques and Lydia Okoibhole). And over the summer we were delighted to be joined by an intern for three months, Bridget Eburne. We also have three honorary positions for Wellcome Connecting Science social sciences researchers: Tuba Bircan, Alessia Costa and Christine Patch.

What is the current evidence base for novel engagement?

To establish a UK academic baseline for public engagement, we conducted an extensive narrative review of over 600 published papers. Our focus was initially on genetics but hypothesise that the conclusions could apply to other scientific fields. We found a lack of consensus on best practices despite the utilisation of various engagement methods such as participatory arts, film, social media, and deliberative approaches. There was no consistently used, evidence-based strategy



Diverse public audience participating in our Hope and Fears lab

evolve how they do their science. Thus, with quiet confidence, we might be able to claim that our Kavli Centre is the first, certainly in the UK.

This reiterates to us the value of our Action Research Cycle approach, where each engagement event we do takes an empirical approach to evaluating what works and what could be improved, so that we can build, grow, iterate and evolve a new evidence base for engagement. In early 2024 the first academic publications of this learning will be scoped.

What is an ‘engaged’ audience?

We’ve been thoughtful about audience stratification and are mindful that currently an ‘engaged audience’ – whether scientist or public - makes deliberate choices to walk towards the conversation opportunities we are offering. To extend this metaphor, we’ve been particularly reflective about what inclusive engagement practices look like for audiences who are standing still, unsure, unfamiliar, or even walking in the other direction.

Our narrative review also showed that, certainly in the UK, publics see the value of science and are interested in it, more so than the overall average in the European Union. However, very few of the UK population feel actively connected to science and a third of the British public says they rarely or never

talk to their family, friends or colleagues about it. We describe this lack of active connection as ‘dis-engagement’, i.e. when asked in a survey publics’ might say they value science, but they do not necessarily intentionally seek it out, maintain and build active connections to it or deliberately lean into conversations about it.

Internationally, many groups have been identified as being historically under-represented in research relating to genomics (i.e., by virtue of their lack of representation they are structurally and practically disconnected or ‘disengaged’ from genomic research, whether by choice or not). These include people from low- and middle-income countries, indigenous peoples, and minority groups including sexual, gender and ethnic minorities. There is also some evidence for greater mistrust of genetics among the D/deaf and hard-of-hearing and sexual and gender minorities, with the latter two groups expressing concerns that questions asked in the research would not accurately capture their behaviours or identity.

And thus, from our narrative review, we see an intersectionality between disengagement and specific profiles of audiences. Therefore, throughout 2023 we have been intentional in the involvement of specific community groups from low and middle-income countries (e.g. Jerome’s Phd work in Ghana and the focus group work in South Africa, India, Turkey and Mexico

for the public survey pages 23- 25) from minority ethnic groups in the UK (e.g. in the Only Human project, page 45) and have been inclusive of public audiences from socially and economically disadvantaged backgrounds (e.g. see the Abbey Lab work on pages 41 - 44).

In this, our second Annual Report we present 10 projects we’ve worked on in 2023 and describe narratively how they match to the Centre’s impact framework. Throughout 2024 we will be developing an easy-to-view dashboard so that in addition to the qualitative descriptions, we can add in the quantitative metrics to demonstrate our impact, evolving over time.

Everything we promised in our strategy for 2023 has been delivered and we are excited to build and extend on this as we move into Year 3 of our new Cambridge Kavli Centre for Ethics, Science, and the Public.

Professor Anna Middleton, Director



Anna Middleton accepting the Vice Chancellor's 2023 Collaboration award for Public Engagement and Impact

Multidisciplinary collaboration among scientists, ethicists, and public engagement experts

In 2023, we focused on expanding our network of scientists, ethicists, creatives and engagement experts to broaden our activities and impact.

Discovery Scientists

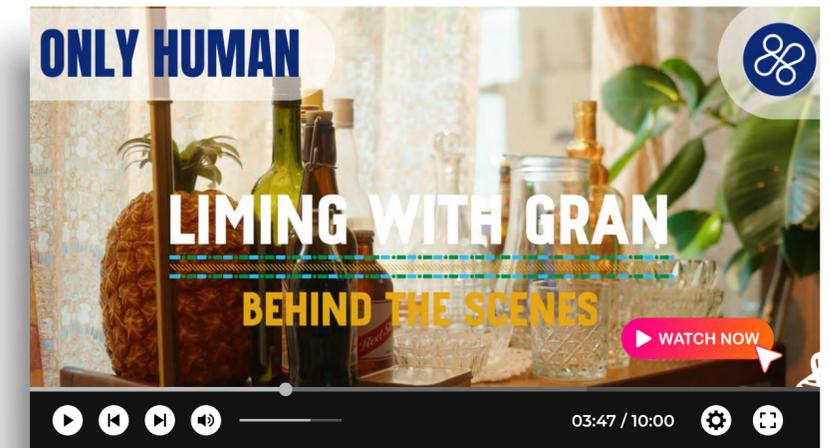
We established ties with the AI research community in Cambridge and the Turing Institute through AI@Cam and the Accelerate Programme on Scientific Discovery, Connected by Data, the Ada Lovelace Institute and Mozilla Foundation. This network includes computer scientists, machine learning experts, and AI policymakers, all of whom contributed valuable insights to the design of our Hopes and Fears events, discussed later. Richard is now a member of the Steering Committee and External Partnerships Committee for the Engineering Biology Interdisciplinary Research Centre and thus has new collaborations with discovery scientists in engineering and biology. This will pave the way for future joint projects in synthetic biology.

Ethicists and policy makers

We are one of the founding Centres of a new cross-disciplinary University initiative called the Cambridge Network for Values and Science (CaNVaS), which connects the Departments of Law, Sociology, Philosophy, the Public Health Genomics Foundation and the Centre for Science and Policy, which will offer us infrastructural academic support for our Centre. We also continue to collaborate with ethicists Mark Sheehan and Mackenzie Graham at the University of Oxford on co-supervised PhD research on trust and trustworthiness in health data sharing.

Creatives

We collaborated with Ridley Scott Film Associates (RSA) and Ketchum PR agency to create films on genomics and ethics for the Only Human project (see page 45). This work aims to create films specifically for public audiences who self-identify as being from a Black and Asian Minority Ethnic background, we asked both RSA and Ketchum to commission a filming crew who also self-identify with these ethnic backgrounds. Thus, we worked with the Director (Yasmin Godo), Assistant Director (Steven O Eniraiyetan) and the Director of Photography (Adenike Oke) with RSA



Behind the scenes film on the making of the Liming with Gran film, funded by CS



Whole filming crew who made the Ridley Scott Film Association films for the Only Human project. Films funded by Kavli

and together they created the storytelling for 3 films about Brenda's perspective on messages for scientists. Brenda Poku is a Ghanaian woman with a lived experience of sickle cell disease who was one of the citizens jurors we had worked with in our previous policy work. Ketchum also worked with local members of the Caribbean community (led by Donya Davis as Head of Design at Ketchum) to co-create their filmed concept on the game of dominoes as a method for fostering inter-generational conversations about genetics.

We also collaborated with [Jonathan Barnbrook](#) to make an animation of one of our focus groups (see later), to act as a flagship film for Only Human. Jonathan is a British graphic designer and film maker who works with artist Damien Hirst and has designed the music album front covers for musician David Bowie. The making of this film was majority funded by Kavli with some contribution from CS.

<https://barnbrook.net/>

Public Engagement

We were one of the majority partners in the Collaborative Futures Academy, a collaborative initiative working with the University of Cambridge Public Engagement team, the Berlin School for Public Engagement, Stellenbosch University and Wellcome Connecting Science. The 2023 Academy took place online over three weeks in May and was a teaching event to develop public engagement skills on ethics of science. It was free to attend and involved a diverse group of over 80 participants, contributors and partners from 19 countries, most of whom were researchers in natural, social or applied sciences (49%) or public engagement practitioners (24%) working to connect research and society through public engagement. 52% of participants came from Europe, 24% from Africa and 24% from elsewhere in the world. 44% of participants were at early career stages, and one of the main motivations to take part was to learn how to work more closely with publics and other stakeholders. 89% of participants said that the Academy had been valuable in learning and applying new skills, tools, and techniques for engaging diverse audiences, had created a supportive network of engaged researchers and practitioners, learning from each other and given participants time to critically reflect on their own public engagement practice. Looking ahead to 2024, we are now planning the next Collaborative Futures Academy, focusing on 'Emotion in Engagement.'

"The outline and content of the course was brilliantly structured keeping in mind the broad spectrum of themes and approaches that can be discussed while talking about ethics, equity and public engagement."

Scientist feedback from the 2023 Collaborative Futures Academy



Richard Milne and Catherine Galloway led on the Collaborative Futures Academy for Cambridge

Broad participation that promotes diverse, equitable and inclusive approaches

Inclusion and equity in-house

The Executive Steering Group for the Centre was originally set up to include Anna, Ricardo Sabates Aysa (Director of Research at the Faculty of Education), Hilary Cremin (Head of the Faculty of Education) and Julian Rayner (Director of Wellcome Connecting Science). Julian is due to leave Wellcome Connecting Science soon and Anna has met informally with each member of the Steering Group throughout 2023. In 2024 we hope to diversify and re-organise the steering group.

We convene weekly as a team, to discuss strategy, operations, and delivery. Our entire staff completed anti-racism training, and we've sought external coaching to navigate cultural change discussions and conducted team-building exercises to address workplace challenges and dynamics.

We prioritise team bonding through activities such as a group trip to the theatre to see 'Farm Hall,' a play about ethical debates among German nuclear scientists. Additionally, we attended the preview of



A diverse and inclusive team that celebrates different lived experiences in relation to gender, disability, religion, language, ethnicity, politics and academic discipline

the Genetic Automata art exhibition at the Wellcome Collection, exploring science and ethics through art and film. The core leadership staff have also undergone their own dedicated training to enhance work-based resilience and mutual support.

In each annual report, we want to celebrate specific individual talents that not only bring

personal joy, but also significantly contribute to our Centre's work. Catherine Galloway, our Innovation and Translation Lead is deeply passionate about literacy and partners with the local charity Abbey People to provide free access to highquality books in Cambridge's disadvantaged Abbey area. Through various initiatives, including the local Food Hub, she

has distributed thousands of books to local children and families struggling with poverty. Catherine's connections have enabled us to create a long term, confidence-building initiative to start conversations with hard-to-reach communities via our Abbey Lab project. Daniela Boraschi, Postdoctoral Research Associate, with an educational background and professional experience in visual and participatory design, has used her design skills to lead in the commissioning of a visual identity expert to create a new brand for the Centre.

Claudette Burch, Administration Lead, is nearing completion of her therapeutic counsellor training. She uses her counselling skills to foster connections with all professional services staff in the Faculty of Education, making the Kavli Centre known for its down-to-earth friendliness. Following recent Hopes & Fears-AI events, Claudette invited the finance team to our office, thanking them for their hard work, patience, and flexibility, despite inflexible systems, and sharing our progress. Claudette manages group operations, allowing the team to concentrate on strategic delivery.

We hosted a second-year natural sciences undergraduate as our 'intern' through the summer of 2023, Bridget Eburne is planning a career in science and spent time with us supporting Abbey Lab and other engagement projects. Since leaving us she has set up a 'Society and Ethics' hub for students at the University to debate and discuss ethics and science.

"I have had such a wonderful time working with the team at Kavli, and I'm grateful to them for trusting me to get stuck in right from the start. Working with a research group in the early stages of its development has been especially valuable for me, and I've really enjoyed how dynamic our discussions have been. Overall it has been a great space for me to voice my creative opinion within a scientific setting - something that I never expected I'd be able to do during my time at Cambridge."

(Bridget Eburne, Intern at the Kavli Centre).

Building a Culture of Equitable Engagement

As we described in a commentary on public engagement in CRISPR research this year (see publications on page 46), we are starting to conceptualise engagement activities as a pathway with different stages. Public engagement is often only assessed as a 'success' if it impacts on policy; and yet, building democratic capacity and soliciting input on value debates are important stages that promote equity in their own right. While differing publics have no less right to be part of the conversation, they start in different places in relation to both the debate and the science. Even if there are no immediate policy outputs, the act of public engagement itself democratises the capacity for participation. Over time this builds people's confidence in engaging with, or becoming involved in, public dialogue activity.

In order to empower scientists and members of the public to engage with the social and ethical implications of science, therefore, we need to cover a series of points on the spectrum from 'disengaged' to 'engaged'. What this looks like in practice is represented by three of the projects we've worked on during the life of the Centre to date, and which are discussed in more detail below. At one end lie the Citizens' Jury on Genome Editing (detailed in 2022 annual report, funded by CS) and People's Panel on AI (see page 32, Kavli funded), intensive and

time-heavy events that require a significant investment of time on the part of members of the public, and that necessarily involve scientists who are confident in their ability to engage in effective conversations with members of the public. At the other end, we situate the Abbey Lab project (see page 40, Kavli funded). This event provided a light-touch entry into science engagement for a wider population and has created the basis for a long-term partnership with a specific community. For both community members and scientists, it provided opportunities for short-lived personal connections, but also, through the questions posed by members of the public, for scientists - including junior researchers - to start to build a relationship with the publics for their work. The Hopes and Fears Lab (see page 32) lies between these poles - it is comparatively light touch for both publics and scientists in terms of preparation or time commitment but enables people to engage in deep conversation where necessary.

Throughout all of our research, we reflect on the diversity of staff involved and the different lived experiences and knowledge they can bring, making sure we include staff at different levels of their career. We also acknowledge the contribution that everyone makes to our work, an example is our flagship publication in 2023 on public engagement on genomics where

the authorship included not only all of the research staff, but the administrators, personal assistants, digital content managers, engagement staff and students, i.e. people who contribute to enabling and supporting the culture we have so that our research can flourish.

Public input into Co-Design of our Work:

In the Only Human project (now Kavli-led as the majority partner), we will be working throughout 2024 with Community Engagement experts Centric (split funding between CS and Kavli) who specialise in working within and for marginalised and disenfranchised communities in South East London, with a particular focus on publics

Claudette Burch and Anna Middleton discussing administration and operational management of the Centre



who have historically been disconnected from policy that affects their lives. Centric was set up by community leaders to facilitate access to people self-identifying as being from Caribbean, African and Pakistani communities. Centric are leading on the research design and delivery for the focus groups with community groups who will assess the films that Ridley Scott Associates and Ketchum have made. This is an example of a partnership with public audiences, where instead of us leading the research, the communities themselves lead the research.

We have also built lasting relationships with some of the public audiences we have involved in our work. An example is the citizens' jury project, where members of the jury have evolved their own identify since completing the jury work, who have invited Anna to be part of their own advocacy work and in turn, two of the jurors have been involved in new projects with us – being part of the Collaborative Futures Academy (giving a perspective of what it was like being a participant in the citizens' jury, to help educate public engagement experts) and being part of the Only Human project as the subject for three films on messages for scientists.

The Abbey Lab work cannot happen without local buy in from communities within the Abbey area of Cambridge. To avoid helicopter research and tokenistic

engagement, the only method for success is to set up partnerships that genuinely serve the community. And so whilst we might have our own strategy to deliver, the community itself has to decide what it needs and the pace for this delivery.

Broad participation of diverse public audiences

Throughout 2023 we have interacted with more than 2000 members of diverse publics via our research and engagement activities:

Majority Kavli Funded:

150 members of the Cambridge and London public who accessed the Hopes and Fears event on the buses in Cambridge or at the community centre in London.

12 representative members of the British public selected for the People's Panel on AI.

150 members of the public and genetics patients attending the 'In our Lifetime' film premiere at the Arts Picturehouse cinema in Cambridge, and participated in policy engagement event.

60 members of the public accessing the Abbey Lab events in the most deprived area of Cambridge, including participants visiting the free Food Hub.

Majority CS Funded:

1000 representative members of the Ghanaian public, recruited in Ghana who completed surveys in Twi and Ewe and 80 members of the public participating in 8 focus groups conducted in Twi and Ewe participating in Jerome Atutoru's PhD.

16 focus groups with 100 members of the British public who self-identify as belonging to the Caribbean, African or Pakistani community in the UK and who are from a disadvantaged socio-economic background delivered as the pilot for the Only Human project.

60 members of representative publics from South Africa, India, Turkey and Mexico who participated in 4 focus groups that were delivered to develop the constructs for the Ethics, Values and Engagement with Science public survey.



Diverse members of the Cambridge public hopped on our buses in Cambridge to meet scientists and chat about the ethics of AI



Kavli funded film on the AI Hopes and Fears Event on the Buses in Cambridge

Evidence-based and cutting edge methodologies

Public and Scientist Surveys on Ethics of Science

These projects aim to understand what shapes publics' and scientists' awareness of, and the ability to act on, the ethical issues associated with discovery science. They will demonstrate, over time, if there is a change in this understanding and whether there is an increase in public and scientist confidence in engaging about ethics of science.



Research discussions focusing on quantitative social sciences methods



International public survey of ethics, values and engagement with science

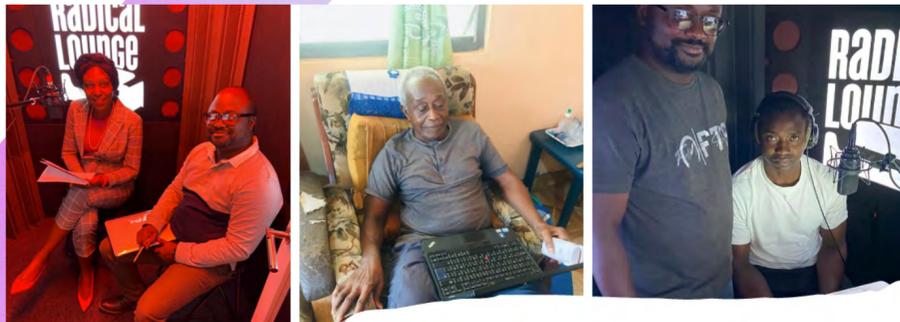
Our international survey to understand public engagement with science and its implications for society has continued to develop throughout 2023. We employed a research assistant (Kavli funded) through the summer of 2023 to review existing measures of engagement in the academic literature as part of the work on the validated measure of engagement, and now have a draft instrument ready for testing, pending governance approval. We also completed the collection of focus group data (CS funded) to explore what science engagement means to representative public audiences in South Africa, India, Turkey and Mexico. We are now interpreting this in light of the constructs needed for the survey and are aiming for the final survey be ready for pre-testing early in 2024. This is where the CS funded input finishes and the Kavli investment takes over. Once pre-testing is complete the survey will be translated and backtranslated into 25 languages and recruitment of representative publics from 33 low, high and middle-income countries (n = 1000 in each country) will be delivered, hopefully by the summer of 2024.

In October 2023, our latest PhD student, Lydia Okoibhole joined the Centre. Lydia's PhD work will be embedded within the survey project, and will explore connections between science engagement and community engagement practice. She hopes to explore how communities affected by sickle cell disease engage in genomics research. This will cover how sociocultural factors influence perception of, and participation with, genomics and how community engagement strategies may influence engagement in a sub-Saharan African or diasporan context. This will be a mixed methods project, using data from the centre's international survey and qualitative ethnographic approaches.

Ghanaian Public attitudes towards Ethical Issues raised by Genomic Data Sharing

Jerome Atutornu hopes to submit his finished PhD thesis for examination in the summer of 2024. This project aims to understand what shapes diverse Ghanaian publics' awareness of, and the ability to act on, the ethical issues associated with genomic data sharing.

He has used a mixed methods approach to collect data in two Ghanaian languages, Twi and Ewe via surveys and focus groups. He will make policy recommendations on how minoritised communities are engaged in conversations about ethical issues raised by genomic data sharing.



AUDIO RECORDINGS

Audio recordings of the audio-visual content were carried out at various stages during the study

Jerome recording the Twi and Ewe translations of his online survey

Understandings of Science Engagement by Scientists (USES) survey

Our work to understand researcher awareness of, and interest in, ethical and social issues associated with scientific research has been expanded through a new survey of scientists' attitudes towards public engagement. The Understandings of Science Engagement by Scientists (USES) survey has been developed in a collaboration with Wellcome Connecting Science and Stellenbosch University. It has a particular focus on dialogic engagement around the ethics of discovery science in the UK and South Africa and is a collaboration with Dr Marina Joubert at Stellenbosch University, building on a relationship established through organising the 2023 Collaborative Futures Academy. Prior work on the factors that shape scientists' attitudes to engagement, including from the AAAS and Wellcome, has suggested the role of personal experience, gender, ideology, worldview as well as prior participation in engagement activities in shaping how scientists perceive the public and the media. However, little research has been conducted on how scientists perceive activities that involve dialogic (i.e. two way communication) engagement with the public, how attitudes towards public engagement vary based on researchers' perception of their own field or how scientists' views compare across countries. This survey has been piloted and

governance approval has been obtained at both the University of Cambridge and CS. Approval at Stellenbosch University is expected in early 2024, at which point the survey will be circulated and recruitment of scientists across the UK and South Africa will begin. We will then draw on our wider networks to conduct subsequent waves of data collection that include the wider scientific community. The majority of the recruitment and costs for this study are covered by Kavli funding, Connecting Science will analyse the Sanger scientist part of the study and the Kavli Centre will analyse the whole dataset.

Ethnographic Studies of Scientist Education, Ethics and Engagement

This research strand aims to foster a model of scientific practice that reflects upon its ethical, social and political commitments. It consists of three projects - the Ethics and Engagement in Discovery Science (EEDS) study (postponed to 2024), the Creativity for Scientific Change (CSC) study and the PhD project on the conceptualisation of race, ethnicity, and ancestry in the culture of genomic research.



Research discussions focusing on qualitative social sciences methods

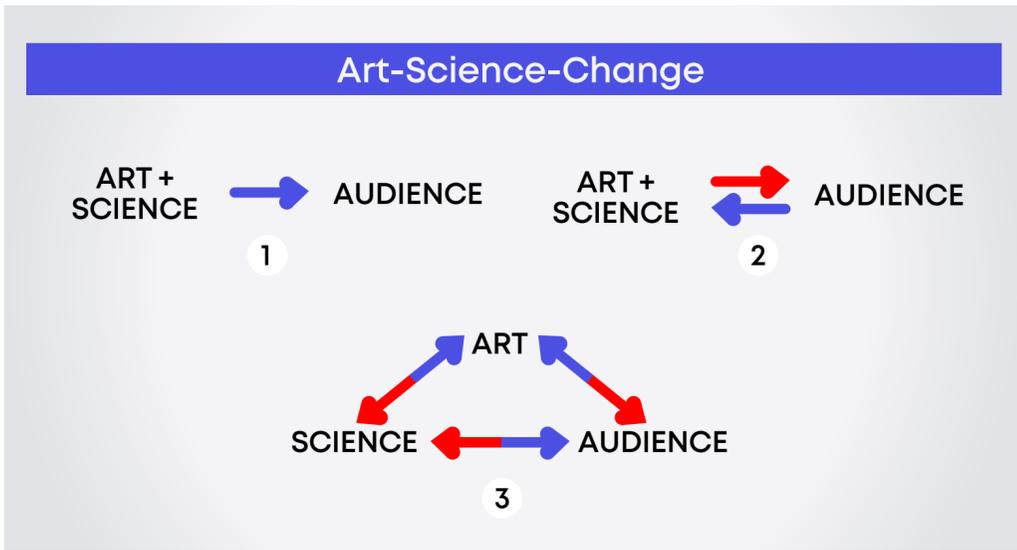
Creativity for Scientific Change

This project aims to understand what shapes scientists' awareness of, and the ability to act on, the ethical issues associated with discovery AI science. It provides novel, creative approaches to engagement about ethics, which (over time) have the potential to increase scientists' ability to anticipate and reflect on ethics, as a normal part of everyday scientific practice. It explores whether scientists believe they will evolve how they do their science as a direct consequence of the creative engagement opportunities this project provides.

The aim is to develop a cutting-edge methodology for creative two-way engagement with the ethics of science, and to evaluate its potential to shape the direction of scientific research through creative public participation. This is done by integrating socially engaged art practices into the domain of science. We are adopting an ethnography based, iterative-inductive case study methodology, which consists of three interconnected stages of research, engagement, and evaluation. This project is funded by Kavli and the Isaac Newton Trust.

Three different labs for discovery scientists will be involved, the first is the Department of Mathematics and the second two labs are currently being scoped. In the Department of Mathematics, Daniela Boraschi, Postdoctoral Associate has been working with discovery scientists developing machine learning, deep learning tools, theories, and methods applied to real life medical problems using AI. She is participating in meetings and workshops (both online and in person), conducting lab-visits, examining documentary data as well as visiting art exhibitions and attending talks and seminars. Most of the scientists have no previous exposure to public engagement.

Findings will be discussed with the scientists and then Daniela will put out an open call to commission creative practitioners to produce art pieces informed by findings from the first stage of research. Scientists will be invited to participate in selecting these practitioners and commit to collaborating for an agreed amount of time with the chosen artist to develop an engagement event that includes dialogue and public participation. These could be a video, or a theatre piece, or an installation or other; and a visual documentation of the dialogues between scientists and the members of the public will be created.



Analytical framework for categorising impact

The evaluation will explore and articulate the potential, as well as the limitations, of this cutting-edge methodology for engaging scientific and public audiences in discussions on the ethics of science and empowering scientists to evolve how they do science.

As part of the underpinning research of this project Daniela has explored what socio-ethical language global experts in AI science, AI ethics, machine learning and computational neuroscience are using in the titles of their presentations at the ACM FAccT (Association for Computing Machinery Conference on Fairness, Accountability and Transparency). Preliminary findings were presented in a poster-showcase during the Cambridge Public Health Early Career Researcher Conference.

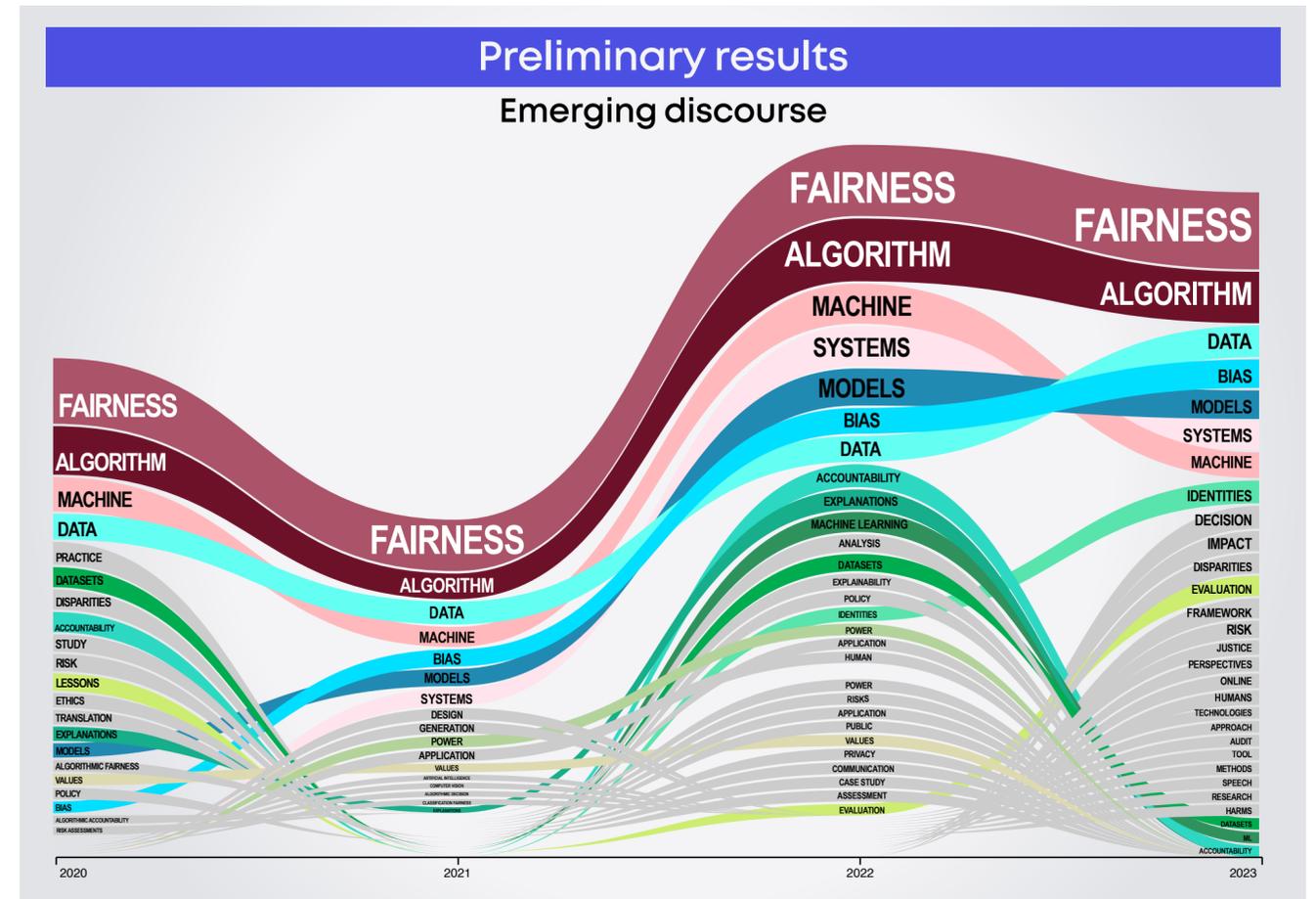
Daniela is developing an analytical

framework that focusses on identifying and categorising how 'change' is conceptualised and achieved (or not) in projects at the intersection of art, science and public participation. The need for this framework became apparent during the preparation for the narrative review of current practices. Noting the challenge of accessing recent relevant projects' information solely from academic databases, which risked excluding many projects not reported in the academic literature, she is developing an alternative approach. This involves identifying projects that are closer to the moment of funding (rather than at their completion as it often happens in reviews) and capturing the language used in the project to describe the concepts, and aims, in relation to change and impacts.

Creating a multidisciplinary collaboration isn't always straightforward. It demands

time and commitment from all participants that can be viewed as an extra, on top of their day jobs. Daniela worked hard to establish the groundwork so that her work aligned with scientists' working practices. This preparatory work, no matter how seemingly small, proved invaluable to establish a collaboration based on trust. Daniela was invited to act as an 'ethicist' in the context of a rebuttal for a paper

submitted to a conference that was flagged by a reviewer with major ethical concerns. The paper was eventually accepted for publication, with the authors commended for engaging with an ethicist. During a workshop that Daniela was taking part of, her presence was acknowledged as being 'not part of this crew,'. However, after taking part in the rebuttal process, Daniela was recognised as being 'part of the crew'.



Changes in high-frequency words in ACM FAccT paper titles (n=481) from 2020 to 2023 show the evolution of socio-ethical themes. 'Fairness' consistently maintains a high-frequency, while other topics peak and fluctuate over time. Additionally, color-coded bands indicate less frequent but consistent topics

The conceptualisation of race, ethnicity, and ancestry in the culture of genomic research

This project delivers on the Kavli Centre strategy by understanding what shapes scientists' awareness of, and the ability to act on, the ethical issues associated with genomics. It also facilitates encounters for diverse members of the public from Black and Asian Minority Ethnic Backgrounds to discuss and deliberate on scientists' views. This will lead to the creation and dissemination of new policy recommendations to help scientists to evolve how they do their science, specifically in relation to anti-racist practices.

Sasha Henriques has now completed two years of her PhD fellowship. This research aims to study if and how social justice forms part of grouping human data in genetic research. Her study design takes a qualitative ethnographic approach and as such she has undertaken observations and in-depth interviews with group leaders and senior genetic scientists at the Wellcome Sanger Institute. The voice of society has been integral to shaping her analysis of the data she is collecting. In keeping with this aim she has organised and participated in simultaneous events and informal interviews with members of the public who have attended the Genetic Automata exhibitions at the Wellcome Collection and the Black Cultural Archives to discuss the themes identified in her interviews with scientists. She now moves into her final year and detailed analysis of the data.



Sasha presenting her PhD to 150 scientists at the Sanger Institute, Cambridge

Bringing a public voice into debates with scientists about AI

These projects facilitate encounters between members of the public and scientists to discuss and deliberate on the societal and ethical questions associated with AI. They provide novel, creative approaches to engagement about ethics, which (over time) have the potential to increase scientists' ability to anticipate and reflect on ethics, as a normal part of everyday scientific practice and publics' confidence in engaging on the same issues.



Discussions about event delivery and integration of research

The AI Hopes and Fears Lab: for light touch dialogue

The traditional science domain has been the laboratory, excluding non-researchers and setting clear boundaries between science and non-science. The Hopes and Fears Lab breaks these norms by moving the lab into public spaces, fostering unexpected conversations that allow people to transcend their usual roles and equalise power dynamics in interactions between scientific experts and the public.

In October 2023 we relocated the Lab into two vintage London double-decker buses which 'popped up' on Cambridge's central green space for our two-day AI themed event as part of the AI Fringe, connected to the AI Summit led by British Prime Minister Rishi Sunak. All Hopes and Fears projects are funded by Kavli and a contribution from the Isaac Newton Trust.

The aims were twofold: to provide an opportunistic and friendly space for diverse members of the public, who perhaps wouldn't traditionally seek out engagement with science, to talk with AI researchers; and to provide an opportunity for scientists to practice talking about their work with publics and through two-way dialogue. The only condition was that the conversation had to lead with a discussion (and listening) about our shared hopes and fears for the science of AI. The event did not have an agenda to push, and the scientists were not encouraged to specifically 'assuage' fears. The goal was to further our collective understanding and make both the public and scientists feel more confident in their ability to discuss the future and ethical implications of AI.

The location meant our buses could attract the attention of passers-by - people from all walks of life stopped to see why two buses were parked on their path to the shops, and we had a team of volunteers ready to introduce the event to them. We discovered that most people had little to some interest in AI, but when told they could hop on the bus, sit with a scientist for 15 minutes and then hop off again, more than 150 of them were curious to give it a go.

On the first day, artist Tom McLean arranged the space with playful cardboard props, such as wearable robot heads and cardboard selfie frames - intentionally designed to create a welcoming and warm atmosphere.

The event was family-friendly, particularly appealing to young families since it took place during school half-term week. Children were provided with activities in the downstairs on the buses so that their parents could go onto the top deck to have conversations with the researchers. On the second day, this space was transformed into a live art installation by community art activist Hilary Cox-Condron. This meant that those members of the public who were curious about the bus, but who didn't want to initiate a conversation with a scientist, could still express their hopes and fears about AI by writing and drawing their views, which formed part of an art installation inside the bus.



Conversations about our shared hopes and fears for the future of AI



Community artist Hilary Cox-Condron co-creating the art installation with the public

Over two days, 22 AI researchers from multiple disciplines volunteered their time, including from machine learning, computer science, psychology, law, neuroscience, pathology, medicine, physics and design which meant we offered nine AI-related conversational themes: AI & Health; AI & Education; AI & Truth; AI & Environment; AI & Fairness; AI & Transport; AI & Work; AI & Creativity; and AI & Everyday Life. The researchers came from a wide range of demographics and most of them had not participated in public dialogue work before. In the evaluation, most of them indicated that they believed taking part in the Hopes and Fears Lab event would help them to talk about the future of their field (87%) and would also affect how they do their research in the future (66%).

“AI could be amazing and help humanity in lots of different ways. I didn't know much about it before but I don't feel as in the dark [now]”

(member of the public)

“Amazing that these conversations are happening and accessible”

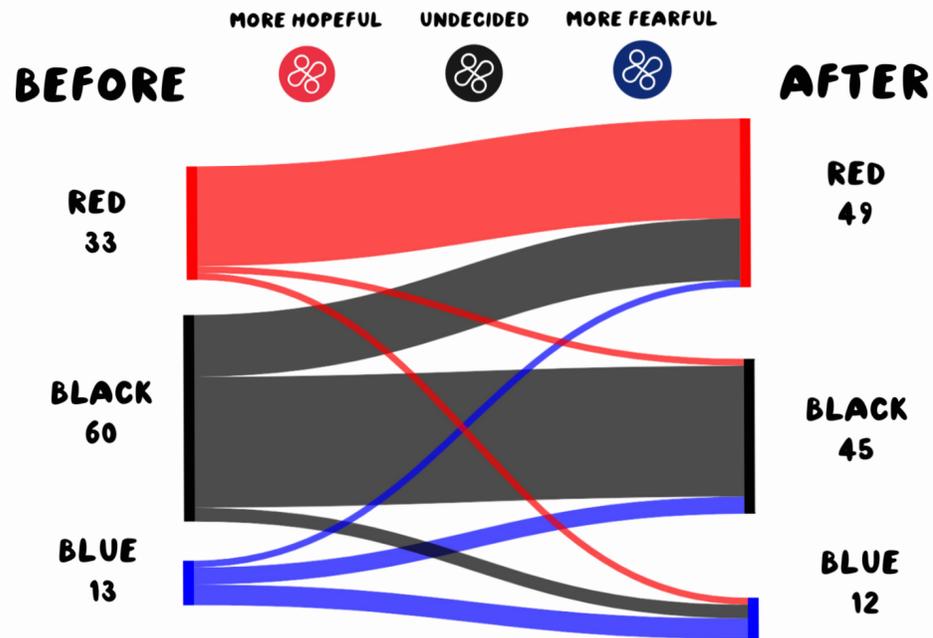
(member of the public)

“It's important to be humble in your interactions with the public and admit what you don't know”

(scientist)

Conversations about our shared hopes and fears for the future of AI





Each member of the public, as well as every volunteer and researcher, was given the option to choose one of three stickers to wear as they entered the bus. A red sticker would indicate that they were more hopeful than fearful about the future of AI, a blue sticker indicated they were more fearful than hopeful, and a black sticker indicated they were undecided. As part of our evaluation, we measured how many people

thought they would pick a different coloured sticker after their conversations.

We had 111 completed evaluations, 30% of people said had changed their perception of AI as a direct consequence of taking part in the event, the biggest shift was from starting the event being undecided about AI and moving to feeling hopeful about it (see figure above).

“Got me to think thoroughly about AI and specifically its impact on young people. I now feel more confident about talking to them about it”

(member of the public)

“Be patient with people and listen to what they say. You might find yourself in interesting conversations”

(scientist)

The AI Hopes and Fears Lab: for in depth dialogue

We are members of the steering group and Kavli co-funded the People’s Panel on AI which was a deliberative panel involving 12 representative members of the public randomly selected by sortition to attend, observe and discuss key events at the AI Summit and the AI Fringe organised by the UK government. As part of their deliberations the panel participated in a pop-up Hopes and Fears Lab that we hosted in a local community space near Kings Cross Station in London. We brought 10 AI researchers to the London event to talk with the People’s Panel in November. This public audience, and the conversations that occurred, were quite different to those at the Bus Hopes and Fears event.

This was because the public in the panel had already observed key presentations delivered as part of the AI Summit and had started to become familiar with the subject matter and could use our London event to ask the AI researchers specific questions, check understanding and discuss the future of AI in more depth.

Artist Tom McLean did live drawing of the conversations as a new way to capture what was happening, and Hilary Cox-Condron created a new, London art installation - with many of our scientists drawing beautiful and detailed responses for her as they waited for someone to chat at their cardboard Lab benches.

The panel produced a public report giving their verdict on AI and their recommendations to government, industry, civil society and academia for further action. Their seven recommendations asked for: global, citizen-focussed awareness raising and a continued conversation, inclusive development and workforce training, and the need for transparency. The recommendations were responded to by TechUK, Mozilla, Ada Lovelace Institute, and Google and the summary report is available here. One key recommendation of the People’s Panel was around ongoing citizen representation in discussions of the future of AI research. As described below, this is something that we’re currently working on as part of our activities towards establishing our international public advisory panel.



Kavli funded film on People’s Panel on AI connecting discovery scientists and diverse publics to write policy for AI

Coming to the Hopes and Fears Lab was completely different to any of the other talks, briefings and discussion sessions the Panel attended that week and they really responded to it - both at the time, and in subsequent feedback to the Panel organisers.

For future Hopes and Fears events, we hope to progress to a scalable model. The Lab has shown true potential to radiate, as evidenced by the enthusiasm following these events - we have had multiple requests to run the lab with other organisations, including from a member of the People's Panel who is inviting us down to Cornwall and from the Alan Turing Institute in London who wonder if we could pop up in Melbourne, Australia!

To respond to this, we would like to develop a 'Hopes and Fears in a Suitcase', which can allow us to pop up the Lab all across the UK (and internationally) with minimal expenditure. This would involve working with local scientists, and creating packs of materials that can be used in any location. We have also been invited to pop up the Lab for Cambridge councillors who are beginning to develop their response to AI, giving us the potential to directly impact wider society in the city that has been called the most 'AI-ready in the UK'.

We plan to submit our work on The Hopes and Fears Lab to a special issue of the Journal of Science Communication on engagement in discovery science.

"AI is about technology and it's about people. We hear a lot about technology and we hear a lot from the technologists and the business leaders and the politicians and the academics, but we haven't heard enough from the people."

Antony Walker, Deputy CEO, TechUK - response to the People's Panel

"I cannot describe the privilege of talking to those people who gave up their very precious time to talk to us. I absolutely appreciated they enunciated on my level, even when talking to an amazing scientist, who was so passionate about physics/maths (I failed my maths O level first time!), but I understood him! [...] I would love a conversation with you around not only the importance of a 'Hopes and Fears' in Cornwall in particular, but, also, how very important what you have done is, for the 'ordinary' citizen of this Country, and the future."

(email from a member of the People's Panel on AI)



"I have changed my ideas around what the impact of 12 people can be. I am now kind of speechless. This is one of the most impactful things I have ever done."

Panel member feedback

Neil Lawrence, Cambridge's DeepMind Professor of Machine Learning, was interviewed for ITV news that evening from within our lab and stayed all day with us, having conversations with Lab participants. See our Media outputs for this media **piece**, on page 49

Novel, creative approaches to engagement

Abbey Lab and the Local Labs Project

These projects explore new approaches for engaging (disengaged) public audiences in discussions on the ethics of science. They facilitate novel, creative approaches to engagement between publics and scientists which (over time) have the potential to increase the publics' confidence in engaging about science and increase their awareness of the futures associated with ethics of science. We aim to explore whether this leads to an increase in public trust that engagement with scientific institutions can lead to meaningful collaboration and change. This work will create policy recommendations on how to deliver public engagement strategies for public audiences from diverse backgrounds.



Discussions about innovation in engagement with diverse audiences

When working with disengaged or regularly overlooked communities, or those with lower science capital, bringing a project such as The Hopes and Fears Lab in the very first instance may simply be too much. Sitting down face to face with a 'real' scientist could be intimidating rather than empowering. We therefore aimed to design

a long term, hyper-local approach that would be more suited to building science confidence and igniting curiosity among these audiences - an approach we trialled with The Abbey Lab event in June 2023.

Abbey is the most deprived ward in Cambridge, the UK's most unequal city. Many residents of the Barnwell area of

Abbey, where we ran our event, live in extremely challenging circumstances - regularly accessing emergency food help, experiencing unstable or unsuitable accommodation, and struggling with poverty. Abbey Lab projects are funded by Kavli and a contribution from the Isaac Newton Trust.

We partnered with local community organisation Abbey People to bring 'The Abbey Lab' to their free family science day; we brought a team of 4 scientists to deliver creative engagement activities that aimed to start some very simple conversations about science. As we were planning a longterm collaboration that would take time to establish confidence and trust, we wanted our first events to focus on listening to what the community wanted to know. Thus, we came with a very open mind and, instead of introducing the ethical issues we thought the community would want to discuss, we let them introduce us to what science they felt was relevant to their lives. Through the three-stage experience described below we met with 60 members of the Abbey community, aged from 6-70. Catherine Galloway, our Innovation and Translation Lead commissioned local artist activist Hilary Cox Condrón (who is known to

many in the community there through her art facilitation projects and is a former trustee of Abbey People). Together we developed a three stage experience based on the key theme of curiosity - establishing the idea that scientists are simply people who are intensely curious about the world and how it works. They ask lots of questions, ergo we all have the innate skills to be scientists.

The first section of The Abbey Lab was an event where we simply asked the audience 'what questions do you want science to answer?' We got down on the floor and across several tables with art materials including huge rolls of paper, coloured pens, plasticine, craft supplies, and regular drawing paper. Participants subsequently asked: "What is a rainbow made of?", "What's the point of slugs?" and "Can you ride a bicycle on the moon?" Some of the teens, whilst initially sceptical, clearly took the opportunity to ask questions that were really on their mind but that couldn't be readily or perhaps publicly addressed in a school science lesson. One particularly poignant example was the question asked by a young teen, "Why does depression and anxiety happen?"

Hilary, Catherine and our summer intern Bridget were on hand as facilitators and encouragers - sitting alongside them on the floor, helping people think about their questions, and how to represent them, and chatting to them in a very informal way about their experience with science (most commonly at school) and how/if they

thought about these kind of topics in any other way. Hilary also took a series of photos of people with their questions once they had finished, appreciating them for asking a *great* question and wondering what *they* thought the answer might be. Bridget collated the questions and, the following day, she emailed these to appropriate scientists (from undergraduates to senior staff across the University) telling them about Abbey Lab and asking them to answer each question in an accessible and engaging way. We have now received an answer to every question and Hilary will now work on producing a photo exhibition that combines large scale posters of our questions and answers. We will return to Abbey Lab in 2024 to deliver these back to the community. This forms part of our strategy to connect and build public confidence and trust in us as a Centre to lead to meaningful collaboration.

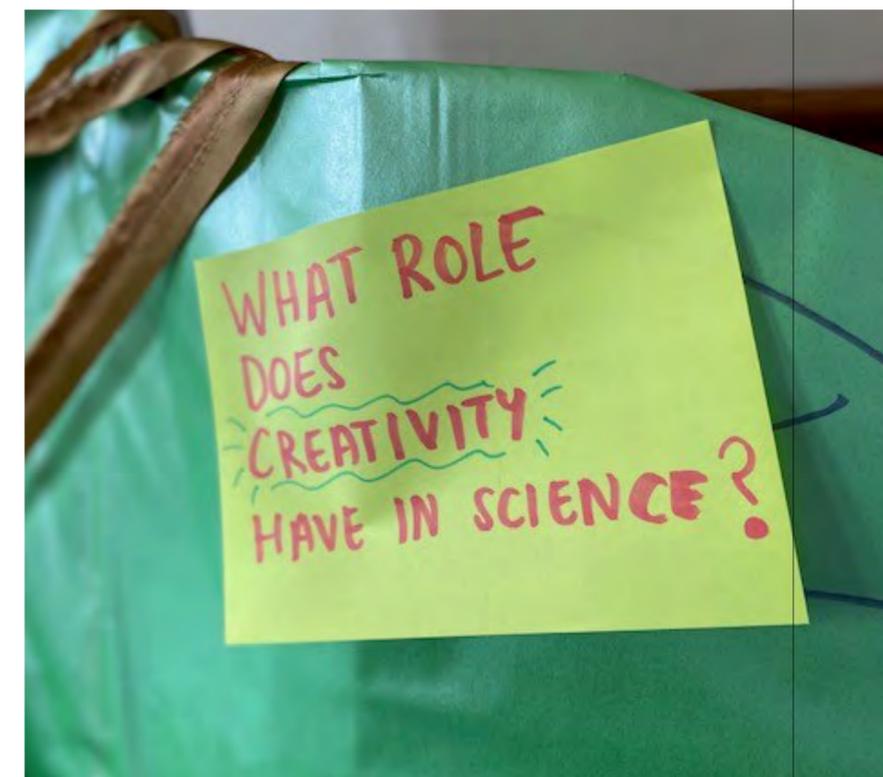
The second section of the day was designed to encourage people to *see* themselves as scientists. Here we were offering a dressing up rail for participants (of all ages!) to create their own idea of what they might look like as a 'real' (or really fabulous and fantastical!) scientist. Hilary had made a large-scale cardboard selfie frame saying 'This is what a scientist looks like!' and we encouraged people to pose in their costumes (or their everyday clothes). Again we recorded these (with permission) to start to move this community towards an idea of 'if you see it, you can be it'. Very intentionally, the *only*

people wearing white coats at The Abbey Lab were *not* professional scientists (Hilary, Catherine, Bridget, and our community participants). The career scientists who were facilitating other aspects of the Family Science Day were encouraged to be pictured in our selfie frame but were all wearing their own everyday clothes - underlining what science looks like when out and about in the world. We also had a local councillor, a member of the University Public Engagement team, and members of the Abbey People team 'trying on science' in this way in our selfies.

The third stage built up from getting curious with our quirky questions, and experimenting with looking 'the part', by offering an opportunity to actually try finding things out for ourselves ('research'). This section was a curated pop-up science library (with a selection of fiction and non-fiction books specifically purchased for The Abbey Lab). The books were displayed for everyone to engage with in the way they wanted to - from simply registering the bright covers and sheer variety of things on offer, to leafing through a few pages, to more specifically selecting a particular book and looking something up. The intent here was to continue to engage parents and children with the ideas of the Lab beyond the confines of the Lab itself - for them to continue thinking and talking about science together without our intervention.

The Abbey Lab event was the start of a process of engaging with and empowering this underserved community and was never designed as a 'one off'. For scientists who have not had the opportunity to engage with underserved communities before, this is a unique way into something grassroots and deeply mutually impactful. In time, we hope these connections might lead to our scientists offering community tours of their lab spaces - with the Kavli Centre subsidising transport, lunches and any additional requirements, and Catherine and Hilary accompanying the tours as community supporters - and create opportunities for local civic engagement with, and involvement in academic science.

Asking the public and scientists to use the art equipment to draw their questions



Only Human

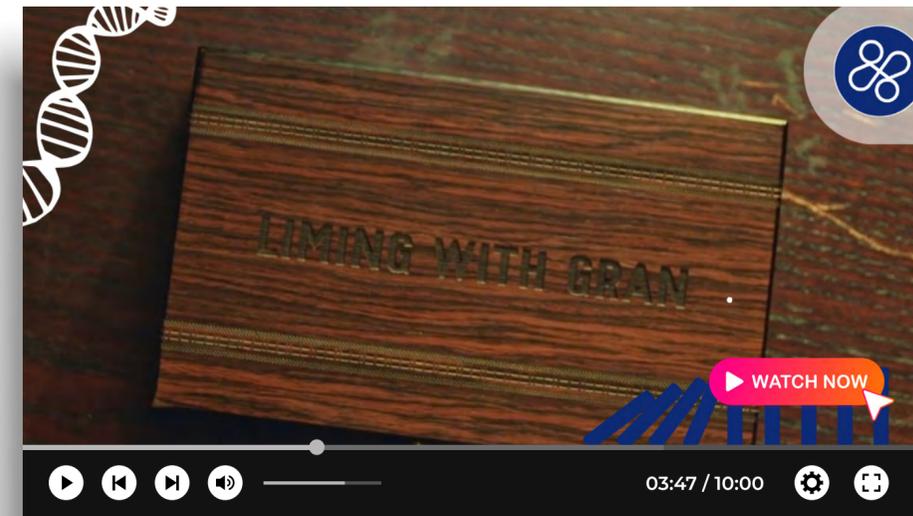
Only Human is an innovative exploratory, research project that aims to explore if there are particular framings, tone, metaphors, memes and creative mechanisms that resonate with broad and specific public audiences. The objectives are thus twofold: to explore how to build the evidence base for communicating with particular disengaged public audiences and to measure whether this does indeed enhance and evolve societal awareness of genomics amongst diverse communities.

The project now has a website (designed by staff from both Kavli and CS) which houses all the films we have made on genetics and ethics. These films form a collection of different 'ways into a conversation' about genetics – some offering technical information about what genetic concepts

mean and others offering perspectives of the ethical impact of genetics (the Ridley Scott films, final editing finished in 2024, Kavli funded). Some of the films were made specifically for this project, others were available in the public domain made and funded separately by us for other research. All films are open access and free for anyone to use and download. Each film has a short survey attached to it, so that viewers of the site can offer their immediate emotional feedback on the films.

www.OnlyHuman.World

Data are gathered via two methods – focus group discussion delivered via our Community Engagement partners Centric and survey responses gathered via the project website. As concluded in the

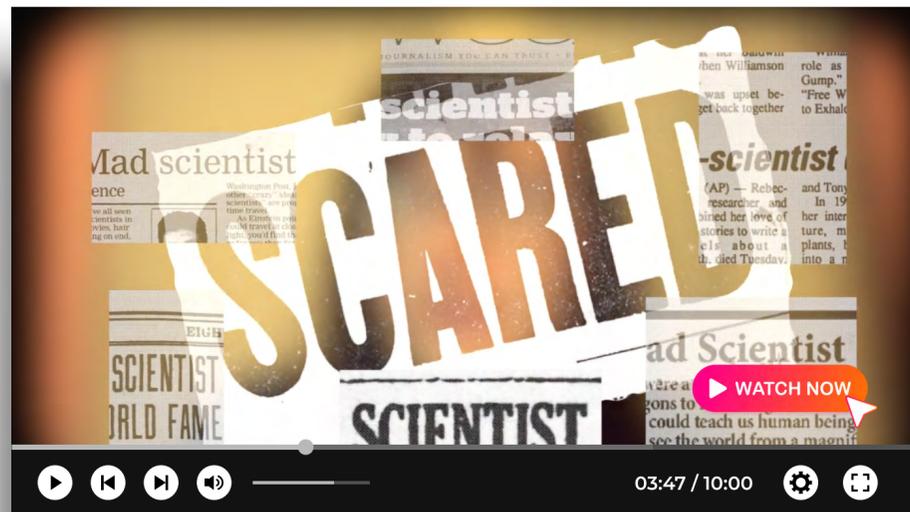


Film: using the game of dominoes to start conversations about genetics

narrative review we published this year on public engagement about genomics, we identified that specific audiences who are currently disengaged from genetics include people who self-identify as belonging to British Caribbean, African and Pakistani communities and so these are the groups Centric will recruit (split funded by Kavli and CS). The project will be submitted for Research Ethics Committee approval in early 2024 and data will be gathered throughout 2024.

One of the films we are trialling is called 'Liming with Gran' (CS funded) a concept developed by Ketchum PR which uses the game of dominoes, culturally appropriate to the British Caribbean community, as a method for communicating within the family about genetics. The message is that a game of dominoes might be a springboard to finding out more about conditions that run through the family and we had a bespoke

set of dominoes made for this project, containing questions that link to genetics, that the players ask of each other, e.g. 'what makes you, you', 'what do you want to know in the family?' Throughout 2024 we will scope out the delivery of 10 sets of dominoes to local Caribbean communities and deliver engagement research to evaluate whether these offer a mechanism for structuring conversations about genetics.



Focus groups (CS) on public attitudes towards science, animation created by artist Jonathan Barnbooke for Kavli

Potential for broad reaching impact that radiates throughout science

Publications

Middleton A et al. (2023). "Public engagement with genomics" Wellcome Open Research, 8, 310. <https://doi.org/10.12688/wellcomeopenres.19473.1>

Milne R et al. (2023) "What Difference Can Public Engagement in Genome Editing Make, and for Whom?" American Journal of Bioethics <https://doi.org/10.1080/15265161.2023.2207545>

Middleton A., Costa A., Milne R., et al. "The legacy of language: What we say, and what people hear, when we talk about genomics". HGG Adv. 2023;4(4):100231

Ford, E., Milne, R., Curlewis, K., (2023) "Ethical issues when using digital biomarkers and artificial intelligence for the early detection of dementia". WIREs Data Mining and Knowledge Discovery e1492. <https://doi.org/10.1002/widm.1492>

Costa, A. and Milne, R. (2023) "Detecting value(s): digital biomarkers for Alzheimer's disease and the valuation of new diagnostic technologies" Sociology of Health and Illness Sep 23. doi: 10.1111/1467-9566.13713. Online ahead of print.

Milne, R., & Patch, C. (2023). Ethical Challenges Associated with Pathogen and Host Genetics in Infectious Disease. The New Bioethics, 29, 24–36.

Presentations

Throughout 2023 we have delivered teaching and presentations on our work to more than 1000 academics:

Boraschi, D (2023) "Discovery Ethics. A framework for fostering art-based conversations between scientists and the public about the ethics of discovery science". Forum Internationale Wissenschaft. University of Bonn (50 mixed academics)

Milne, R (2023) "Public Hopes and Fears for AI" keynote talk at AI-ideas Challenge Development Workshop, AI@Cam (100 AI scientists)

Milne, R (2023) "What role for the public in the ethics of AI", invited talk at EPSRC Sensors Day, University of Cambridge (50 mixed academics)

Milne, R (2023) Talk to Cambridge Centre for Data-Driven Discovery on "Trustworthy and Responsible AI", Cambridge, (50 AI scientists)

Milne, R (2023) Keynote at EMBL-EBI conference "What role for the public in the ethics of science?" EMBL Heidelberg (200 discovery scientists)

Milne, R (2023) "Interdisciplinary working between science and society" closing conference of the Wellcome Animal Research Nexus, London (100 mixed scientists, public engagement experts and ethicists)

Milne, R (2023) CCAIM, Summer School talk, "Ethics of Early Detection" (200 mixed academics)



KCESP at Cambridge and UC Berkeley at the Falling Walls Summit 2023



Milne, R (2023) "How to design pathogen genomics training" (30 scientists)

Milne, R (2023) "Ethics and Engagement in Genomics" PhD students training (30 scientist PhD students)

Middleton, A (2023) "Ethics, Science, and the Public", training for final year undergraduate teacher training for science specialists, Faculty of Education, University of Cambridge (50 trainee science teachers)

Middleton, A (2023) Wellcome Connecting Science, "Citizens' Jury on Genome Editing" (132 discovery scientists)

Middleton A (2023) Panel discussion on Ethics, Science, and the Public. Falling Walls Conference, Berlin (50 mixed audience of scientists, policy makers, funders)

Academic posters

Boraschi, D. "Exploring Ethics Discourses in Practice in AI Research". Cambridge Public Health Early Career Researcher Poster Showcase. Cambridge. November 2023. Online [here](#)

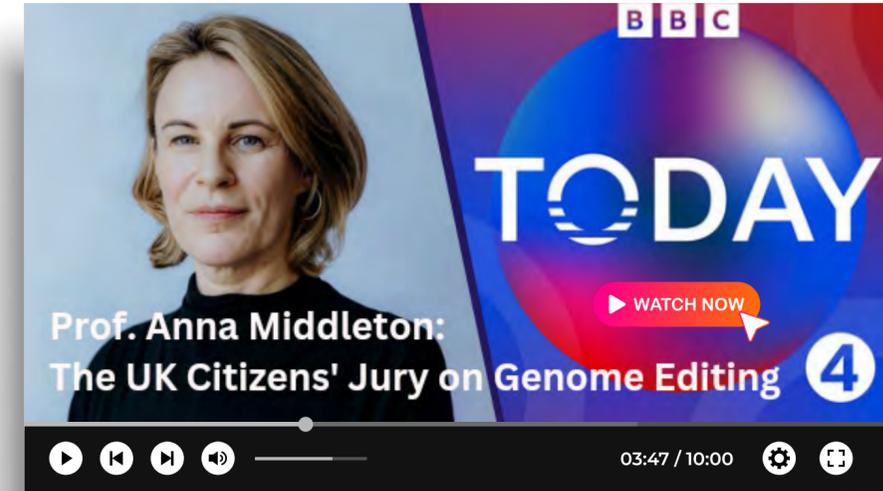
Media



The AI Hopes and Fears Lab Bus Event on local ITV news, which has an average of 1mill viewers per night



The AI Hopes and Fears Lab Peoples Panel event on national ITV news, which has an average of 3.6mill viewers per night



Discussing ethics of germline editing and public engagement on BBC radio news, which has an average of 5.6mill listeners per day



Anna interviewed by the Guardian newspaper, national British newspaper with 3.2mill national print and 18.4mill monthly digital readership

Committee Membership

As testimony to our growing influence, we have been invited to be part of two new committees in 2023 - Daniela is an invited member of the Public Engagement Steering Committee of the Wellcome-MRC Cambridge Stem Cell Institute, and Anna now serves on the Governance Oversight Group for the Stem Cell-Based Embryo Models group, contributing to public engagement to support governance. Richard continues to be a member of the Ethics Advisory Board for the UK's Our Future Health project.

In our Impact Framework we have created a series of metrics that are now in Impact Tracker so that we can catalogue if we have indeed had broad reaching impact. And while these will clearly demonstrate the size, scale and reach of our work and objectively these could be seen as broad reaching across science literature and science audiences, the ability to change the way science is done is a task that would be difficult for one Centre to deliver on its own. Research culture change requires a collective effort around the world of science. The scale of the challenge is obvious, however, one hurdle that collectively we need to overcome is creating the conditions so that science itself, and the administrators of science, have an appetite to receive the recommendations we make.

The ability to radiate is dependent on science being open to change

Gently challenging the status quo, by creating more opportunities for connections between scientists and diverse publics has, on the whole, been positive. But we have also noticed it has led to some scientist colleagues expressing a sense of discomfort that materialises itself in a couple of different ways. Firstly – an anxiety about whether public audiences will ‘understand discovery science’ which translates itself as ‘I don’t know where the common ground is for even starting a conversation’. This is where our Hopes and Fears concept has been helpful as everyone has the ability to imagine a future that considers our personal hopes and fears, this in turn takes the pressure of scientists feeling that they need to teach their discovery science.

Secondly, an anxiety that if public audiences ‘disapprove’ or have negative attitudes that this in of itself could threaten the continuation of science. This anxiety has sometimes been expressed as the engagement itself being ‘too risky’ or may lead to ‘reputational damage to science’.

It has also resulted in disproportionate scrutiny and questions from some scientists about whether engagement research is ‘high risk’.

We have thus needed to have reassuring conversations where we’ve assured scientist colleagues that ‘negative public attitudes’ don’t equate to ‘science must end’, but rather ‘conversation is good’. When considering our ability to disseminate and ‘radiate’ our outputs through science we are aware that part of this journey includes navigating the push-back from scientists and administrators of science who may not yet have appetite for scientific change.

While the staff of our Kavli Centre are excited to be pioneers in navigating these conversations, the time and emotional burden of this environment should not be underestimated, and we have sought support from each other to create a positive work environment internally where we can share and think through these challenges together. This is where the creation of a nurturing, inclusive internal space has been pivotal for us as a team - with time carved out for team building activities and the creation of a collective resilience.

Looking to 2024

Our planning for 2024 is well underway and the first research publications on the Hopes and Fears concept, as well as the design work for the public and scientist surveys will be written up.

In March, we will be working with the Public Engagement team from the University of Cambridge to scope out and then deliver our ethics and science film festival, which we have given the working title: “Just. Good. Science.” Film Festival.

In May, we are planning a collaborative dialogue event with the British Deaf Association to help them develop a new policy around genetics. Anna is working directly with members of the Deaf community (Deaf, written with a capital ‘D’ refers to people who use British Sign Language as their first and preferred language, who do not see their deafness as a disability). The British Deaf Association asked us to co-design a debate on the ethical issues raised by cutting edge genetic technology. Our Centre will be hosting a day’s workshop to connect members of the Deaf community with scientists working in genetics with the aim of supporting the BDA to write their own policy on genetics for their community.

We will also support them by filming this event and creating a short summary that they (and we) can share with policy makers, scientists and members of the public. This will be our first event delivered fully in British Sign Language, fully co-created, co-designed with a diverse mix of Deaf and hearing perspectives into the construction of the event.

In late spring or summer, we are also hoping to hold a public dialogue around engineering biology/synthetic biology, following productive early conversations with the Engineering Biology Interdisciplinary Research Centre at the University of Cambridge.

In July, Daniela, Richard and our honorary associate and colleague at Wellcome Connecting Science, Alessia Costa, are convening a panel at the joint conference of the Society for Social Studies of Science and European Association for Studies of Science and Technology, a key forum for social science work on new and emerging science and responsible research and innovation. The panel will focus on approaches to incorporating ethical reflection in scientific research.

By the summer both our International public survey and validated measure of engagement should be translated and ready for recruitment. Also by the summer the scientist survey should be ready for recruitment.

Throughout the year we will be scoping and planning our World Congress on Science, Ethics, Public and we will also be recruiting into the Only Human project.

In terms of infrastructure, we will also all finish getting Impact Tracker fully operational so that our impact tracking is consistent and up to date.

Changes and Adjustments

Our progress this year has involved a few deviations from our original proposal. Some of this involves new projects, notably the development of the Abbey Lab initiative, and the partnership with the British Deaf Association on the forthcoming dialogue.

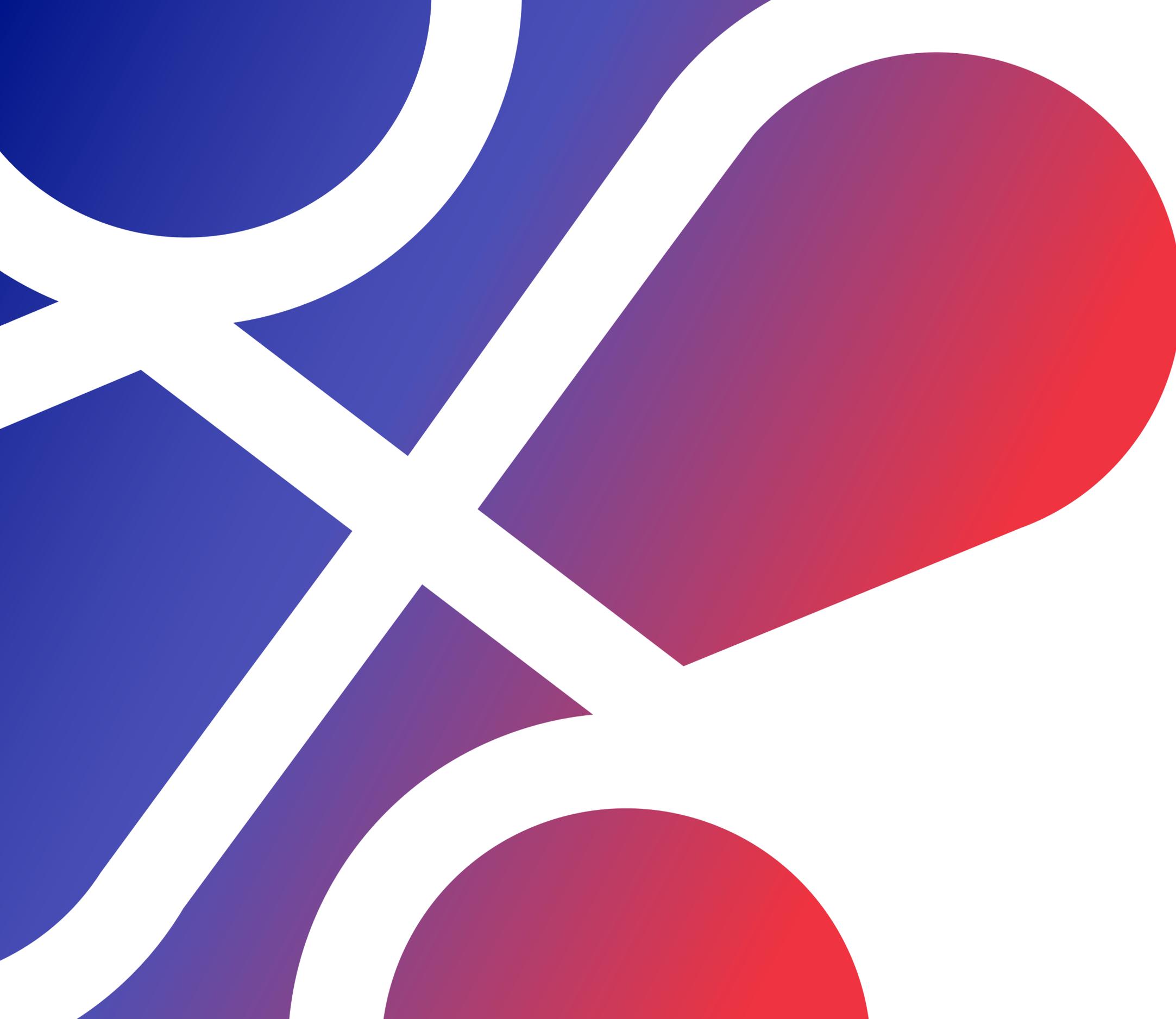
However, we have also experienced some delays on the research work which has largely been due to a fluctuating governance landscape at Wellcome Connecting Science which has meant we have had to prioritised other planned activities.

We had aimed to introduce the International Public Advisory Panel this year and have spent time considering how this group should or can be established in order to have the greatest impact in our work, and the greatest value for members of the public. We have worked with the central University Public Engagement team to connect with their efforts to develop community partnerships. We have also considered how we can build on our existing deliberative activities - the Citizens Jury on Genome Editing and the People’s Panel on AI.

While deliberative processes are commonly one-off events, there has been a growing move in democratic innovation over the last couple of years towards the creation of standing citizen's councils or assemblies that may provide inspiration for how a public advisory panel might function and what it might hope to achieve. In addition, observing the robust communities that have formed following the deliberative events we have organised over the last two years has prompted questions about how we can engage with the enthusiasm and tacit expertise of these participants. We are currently involved in discussions with our partners on the People's Panel on AI to explore the potential for a standing citizen's panel on AI. We are also in continuing discussions with members of our Citizen's Jury on how they might be involved in a similar panel around genome editing. We hope that these groups might form the initial membership for a standing panel in 2024, after which we will aim to expand international representation in these processes and to consider how we build frameworks that can endure as and when the original participants move on.

Horizon Scanning

In our original plans, we proposed a horizon scanning of international bioethics bodies. We have postponed this work, in order to add in the additional engagement work that we have undertaken this year. We may revisit it to inform future iterations of the international Understanding Science Engagement survey. However, we are also exploring the potential value of activities like the Nuffield Council on Bioethics' horizon scanning tool and GESDA's Science Breakthrough Radar.



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