Big Data: Public views on the use of private sector data for social research

A Findings Report for the Economic and Social Research Council

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Executive summary

Background

This report describes the findings from a two round public dialogue process involving 62 members of the public in Colchester, Glasgow and London. The aim of the public dialogue was:

To explore public views on access to and the use of data from private sector organisations for research purposes in the context of three Data Research Centres funded by the ESRC. The aim of these is to enable access to private sector data for innovative social research with impact.[1]

The Economic and Social Research Council (ESRC) commissioned the public dialogue. It is a Non-Departmental Public Body, established in 1965, largely funded through the Department of Business Innovation and Skills (BIS). It is one of the seven Research Councils in the UK and is the UK's largest organisation for funding research on economic and social issues.

In February 2014, the Economic and Social Research Council (ESRC) commissioned three Data Research Centres as part of Phase II of the ESRC Big Data Network. These are national centres of expertise that will offer data, training and other resources for researchers to harness the value of big data from private sector and local government in safe and engaging ways to inspire innovative research which will inform local government policies and businesses' practices and will ultimately benefit society and the economy.

More specifically, the objectives of the centres are to:

- Provide services to enable safe research access to private sector and/or local government data
- Collaborate with data owners and encourage participation
- Act as centres of expertise for particular data types
- Conduct and stimulate an original programme of research
- Undertake training and capacity building; and
- Engage with the public to increase understanding of the benefits and safeguards and to ensure, in return, that their views inform the work of the centres.

The ESRC-funded UK Data Service will be supporting all three Centres in their work to acquire and curate private sector data for social research. The three Centres are:

- The Urban Big Data Centre: at the University of Glasgow

Which has been established to meet the needs of a wide range of users who wish to conduct research on urban issues using big data.

- The ESRC Business and Local Government Data Research Centre: at the University of Essex

Works in advanced analytics to help companies, local authorities and academics use data more effectively.

- The Consumer Data Research Centre: at the University of Leeds and at University College London

An academic led, multi-institution laboratory which discovers, mines, analyses and synthesises consumer-related datasets from around the UK.

Hopkins Van Mil: Creating Connections Ltd (HVM) led on the design, facilitation and reporting of the dialogue process. HVM is about engagement to gain insight. As expert dialogue facilitators the team creates safe, neutral and productive spaces in which to access people's views on the content that matters to them.

The views described and analysed in the report are drawn exclusively from the public dialogue and the presentations given during the two sessions.

[1] Project ITT

1. Views on data collection by the private sector

The majority of participants in the dialogue demonstrated an awareness that their activities as consumers generate a wealth of data about them which is then at the disposal of private sector companies. The use of the internet, online shopping, loyalty, bank, and travel cards featured a lot in participant discussions on the data generated for use by private sector companies on a daily basis.

Although many participants were taken by surprise at the extent and size of data collection by the private sector, there was a general awareness as the dialogue progressed of how valuable these data are for private sector companies, particularly for marketing purposes. There was also an awareness of how such data enable companies to fulfil their organisational objectives. The majority of participants said they did not object to their data being used by private sector companies recognising that this might enable companies to run their organisations more efficiently and effectively which would benefit their customers.

A minority of participants voiced their concern on the possible impact of data use, particularly data identifying the individual, on their privacy. Many acknowledged the potential risks to privacy and data security but not all of those who expressed concern saw themselves as having the power or the desire to do something about it. A very small minority of participants were very clear about the steps they took to avoid their records being recorded on systems. However, in general there was an acceptance that it is very hard to keep all data private and the majority of participants accepted that data collection by commercial organisations has become an integral part of our society.

At an early stage in the first round of the dialogue participants were asked to consider a range of data-related information cards (see Technical Appendix p.57-75). From this discussion the idea of data linkage was particularly picked up as an area of interest along with the Data Protection Act (DPA). When presented with information on how various data can be shared and linked among private sector providers and others, participants acknowledged the increased risk of personal identification and, in a minority of cases, felt that such data capture was frequently unwarranted. On the other hand, linked data that did not contain information which could identify the individual was seen as less sensitive and thus its collection was more acceptable to participants. Participants were particularly intrigued by the principles within the DPA that included keeping data secure and safe and using data in a way that is adequate, relevant and not excessive.

2. The use of private sector data for research

In response to presentations by directors and senior academics from the Data Centres on how they use private sector data for specific projects, participants expressed very positive attitudes to the use of private sector data for social research purposes. Participants were very appreciative, for example, of the impact of social research using private sector data on improving local, regional and national policies and delivering more effective services which benefit local communities.

There was a perceived risk among participants that these benefits might not be realised if the data was left solely in the hands of commercial organisations and regulated sector, rather than being shared with, for example, social scientists and the Data Centres.

The opportunity to engage participants with some of the academic research agendas of the three ESRC funded Data Research Centres increased participant appreciation of the value of this data for academic research, public policy and services including health and social care, education and transport. In this context the majority of participants found it acceptable that individual level anonymised data are being shared and linked. Some participants felt that the use of personal data for social research is justifiable, particularly if it benefits certain groups. Most participants further, found acceptable the analysis of data that does not include personal details but focusses on trends and patterns.

Some participants raised the issue of ethics and the importance of having safeguards in place to ensure that linking private sector data for social research and other purposes is legal and ethical. The expertise and professional reputation of those undertaking social research enabled by the Data Centres was seen as reassuring.

3. Qualities of an acceptable data infrastructure

In the second round of the public dialogue senior academics from the Data Research Centres presented the data infrastructures and various safeguards to keep data and access secure. The issues and questions raised by participants in reaction to this information provide a useful insight into the main attributes of a data infrastructure that is acceptable (or not) to the public. Overall participants were appreciative of the infrastructures in place at the Data Centres.

There are three main points to raise here:

1. It is important to those who took part in the dialogue that a data infrastructure funded by public funds and relying on private sector data operates independently of government biases and of the interests of commercial organisations.

2. Participants were reassured by a data infrastructure that has in place strong safeguards to protect privacy, including clear vetting procedures for researchers and penalties for data breaches. However, they recognised this needs to be balanced with the need to progress social research projects.

3. Participants also indicated that impartiality and expertise should lie at the heart of decision making about data acquisitions and research approvals.

4. Public views on key themes: Data Acquisition, storage, access and ownership

Once participants had familiarised themselves with the work of the Data Centres and the potential benefits of using private sector data, they were presented with specific information on Data Research Centres' plans to acquire, store and allow access to data. They reflected on four key themes: data acquisition, storage, access, and data ownership. Overall, participants were supportive of and positive about the Centre's plans to acquire, store and allow access to data.

Data acquisition

There was consensus that the Data Research Centres should have effective procedures for acquiring data that are accurate, relevant and of sufficient quality. The dialogue findings did not reveal widespread support for payment for data sets, particularly if participants thought that the companies allowing access to data might make a profit from the process. A large minority of participants expressed the view that companies have a moral duty to give data free of charge particularly if they are regulated companies, such as those in the energy and transport sectors, and if the research is of public benefit.

Data storage and preservation

Participants had very low awareness of data storage practices. Most had difficulty accepting that digital storage is as safe as, or even safer than physical storage. Discussions indicated that there is a need for clear information about data storage processes at the Data Centres. In order to trust the process, the public need to know:

- More about how data are stored and destroyed
- What data are being stored, for what purpose and for how long
- What security measures are in place.

The public also need to be reassured that the data storage systems at the Data Research Centres will enable future generations to access the data.

Data access

Participants were broadly acceptant of the different safeguards to data access depending on the sensitivity of the data. For most their front of mind response to data access principles at the beginning of the dialogues was linked to security concerns such as fraudulent use of data and identity theft. As a consequence some participants were more in favour of secure physical settings for access to data rather than remote access through a virtual machine.

What concerned participants most about data access is what happens when controlled data are linked. Many of the concerns were alleviated as they familiarised themselves throughout the dialogue with the access processes that are currently in place and being planned at the Data Centres. Similarly, participants

were willing to make a trade-off between concerns about not having the opportunity to consent to the use of private sector data for social research purposes and the benefits of social research for society. This demonstrated that trust can be built with improved communication about the data access procedures, in particular in relation to more sensitive personal and individual level data sets.

Data ownership

Like data storage, data ownership was a complicated concept for most participants to grasp. Although some understood clearly that data ownership transfers when data is shared with private sector companies, many believed that private individuals own their own data. An important concern for most participants was that the public doesn't know who is holding data on them. They called for improved communication about what data are owned and/or used by the Data Centres.

5. Views on public engagement and communication

The dialogue on the use and re-use of private sector data for social research demonstrated that the public is generally unaware of the concept of big data and what social research is. The Data Centres were formed in 2014 as a new initiative within the ESRC's investment in big data. As such participants were not aware of what the Data Centres are and what their future role in society is. There was a sense that raising awareness of data collection processes in general is very important as many people do not realise they share data many times a day. Raising awareness of the work of the Data Centres is equally important to ensure people understand and acknowledge the value of this data for the social sciences and society.

Recommendations for improved engagement with the public include:

- Emphasise how individuals benefit from the use of private sector data for social research
- Improve communication about Data Centre processes and safeguards
- Share research objectives and outcomes
- Instigate two-way communication when using personally-identifiable data
- Use a wide range of channels to deliver the message
- Use plain, jargon-free English.

In addition participants were keen to see education programmes for children and their parents on big data and the work of the Data Centres. Whilst it is understood that this is not in the remit of the Data Centres it is important to include it in the recommendations for broader engagement with the public on these issues.

Conclusion

The dialogue demonstrated that there is wide public support for the use and re-use of private sector data for social research. The public trust the Data Centres more than the commercial and regulated sectors and as such they expect that the Data Centres to have very strict processes in place to check the quality and accuracy of data acquired from such companies.

Access to information about the Data Centre processes as the dialogue unfolded alleviated a lot of the concerns people had initially around security and privacy. An increased appreciation of the benefits of social research for everyone in society meant that a trade-off took place between concerns and perceived risks of the use of private sector data in favour of research that leads to improvements in policy and services.

As a consequence improved communication about the processes by which the Data Centres acquire, store, own and access private sector data is vitally important to establish greater credibility with the public. A practical recommendation resultant from the findings is that the Data Centres develop a clear communications and public engagement framework, which might include specific case studies, to demonstrate how the use of private sector data in social research can lead to policy or service improvements.

In designing, facilitating and reporting on the dialogue HVM has found that the public find the issue of the use and re-use of private sector data for social research complex, but not impenetrable. A clear communications and public engagement framework for communication with the public would be extremely valuable in addressing concerns. Participants, once introduced to the concept demonstrated a clear interest

in the subject of data use and re-use and as a result wished to find out more about how it contributes to public benefit. A communications and public engagement framework would enable the Data Centres to nurture this interest and provide clear and accessible information on Centre data management processes. It could include:

- Clarity that by default data would be used where no disclosure risk was posed and that, where avoidable, personal data would not be used, in isolation or via linkage with other data
- The safeguarding steps taken when the research necessitates the use of personal or sensitive personal data;
- Information on data ownership, an area which raised many questions for participants
- Confirmation in Centre communication that when data are fully anonymised or de-identified, they are not (necessarily) personal

The dialogue findings clearly demonstrate that the more information people are given about Data Centre processes and the benefits of using private sector data for social research, the more likely it is that the public will support and be very much interested in their work.

Hopkins Van Mil: Creating Connections Ltd
October 2015

Introduction to the dialogue process

1. Dialogue aim and objectives

The public dialogue on the use and re-use of private sector data for research had the following aim:

To explore public views on access to and the use of data from private sector organisations for research purposes in the context of three Data Research Centres funded by the ESRC. The aim of these is to enable access to private sector data for innovative social research with impact.[2]

The Economic and Social Research Council (ESRC) commissioned the public dialogue. It a Non-Departmental Public Body, established in 1965, largely funded through the Department of Business Innovation and Skills (BIS). It is one of the seven Research Councils in the UK and is the UK's largest organisation for funding research on economic and social issues.

ESRC has a total annual budget of £200 million. At any one time it supports over 4,000 researchers and postgraduate students. All funding decisions are based around 3 core principles:

- Quality – the research and people it funds are excellent
- Impact – that research should have an impact on society
- Independence – although funded by government it is independent of it

ESRC's work spans research, training and infrastructure. This is delivered in partnership across disciplines; with the public, private and voluntary sectors to ensure research has an impact; with other countries as many challenges are global and need global cooperation; and vitally, with the public to ensure understanding of what we are doing and why and to test out how and why we should develop in new areas.

In February 2014 the ESRC commissioned three Data Research Centres as part of Phase II of the ESRC Big Data Network. These are national centres of expertise that will offer data, training and other resources for researchers to harness the value of big data from private sector and local government in safe and engaging ways to inspire innovative research which will inform local government policies and businesses' practices and will ultimately benefit society and the economy.

More specifically, the objectives of the centres are to:

- Provide services to enable safe research access to private sector and/or local government data
- Collaborate with data owners and encourage participation
- Act as centres of expertise for particular data types
- Conduct and stimulate an original programme of research
- Undertake training and capacity building; and
- Engage with the public to increase understanding of the benefits and safeguards and to ensure, in return, that their views inform the work of the centres.

The ESRC-funded UK Data Service will be supporting all three Centres in their work to acquire and curate private sector data for social research. The three Centres are:

- The Urban Big Data Centre: at the University of Glasgow

Which has been established to meet the needs of a wide range of users who wish to conduct research on urban issues using big data. It aims to provide an integrated data service by collecting and providing access to diverse types of big data covering a wide range of themes or topics.

[2] Project ITT

- The ESRC Business and Local Government Data Research Centre: at the University of Essex

Works in advanced analytics to help companies, local authorities and academics use data more effectively. The Centre provides unique data services and a world-class facility that brings together the expertise of academic researchers, social scientists, data scientists and statisticians across universities in the East of England to enable better decision making and help organisations solve real issues.

- The Consumer Data Research Centre: at the University of Leeds and at University College London

An academic led, multi-institution laboratory which discovers, mines, analyses and synthesises consumer-related datasets from around the UK.

Hopkins Van Mil: Creating Connections Ltd (HVM) led on the design, facilitation and reporting on the dialogue process. HVM is about engagement to gain insight. As expert dialogue facilitators the team creates safe, neutral and productive spaces in which to access people's views on the content that matters to them. HVM bridges the gap between policy and decision-making and the views of communities and members of the public for whom policies and decisions are made. HVM and associates work flexibly and build trust using best practice guidance including the Sciencewise Principles[3].

The following objectives informed the design of the two round dialogue process:

- To understand in more depth public views on specific areas of developing infrastructures to access private sector data for research purposes
- To identify areas of public concern regarding confidentiality and privacy impact
- To start creating a language around private sector data and access to and use of these for research purposes that is meaningful and accessible to the public
- To test public understanding of:
  - Data ownership
  - Data acquisition
  - Data access
  - Using/ re-using private sector data
  - Data storage & presentation
  - Public engagement & communications

2. Public dialogue collaborators

Although responsibility for the delivery and content of the dialogue remained with the ESRC and HVM, input was gratefully received by the following people, some of whom were members of the Steering Committee (SC):

- Trazar Astley-Reid, Communications and Public Engagement Manager, The Administrative Data Service (SC)
- Nick Bailey, Professor of Urban Studies and Associate Director of the ESRC Urban Big Data Centre, University of Glasgow
- Natalie Banner, Policy Manager and EAGDA Secretariat, Wellcome Trust (SC)
- Mark Birkin, Professor of Spatial Analysis and Policy and Director of the ESRC Consumer Data Research Centre, University of Leeds
- Simon Briscoe, Vice chair, ESRC Data Infrastructure Strategic Advisory Committee (SC - Chair)
- Sarah Currier, Project Manager, ESRC Urban Big Data Centre, University of Glasgow
- Joseph Ellery, Policy Officer, ESRC
- Genevieve Groom, Principal Researcher, Office for National Statistics (SC)
- Mary Hickman, Independent research consultant (SC)

[3] http://www.sciencewise-erc.org.uk/cms/assets/Uploads/Publications/Guiding-PrinciplesSciencewise-ERC-Guiding-Principles.pdf

- Tom Howard, Project Manager, ESRC Business and Local Government Data Research Centre, University of Essex
- Paul Longley, Professor of Geography and Director of the ESRC Consumer Data Research Centre, University College London (SC)
- Paul Meller, Head of Data and Resources, Economic and Social Research Council (SC)
- Victoria Moody, Mimas Senior Manager and Director of Impact and Communications - UK Data Service (SC)
- Amy O'Neill, Project Manager, ESRC Consumer Data Research Centre, University of Leeds
- Vania Sena, Professor of Business Economics and Entrepreneurship and Director of the ESRC Business and Local Government Data Research Centre, University of Essex
- Sarah Sheppard, Project Manager, ESRC Consumer Data Research Centre, University College London
- Maria Sigala, Senior Policy Manager, Economic and Social Research Council (SC)
- Martin Squires, Head of Customer Insight, Boots (SC)
- Daniel Start, Dialogue Engagement Specialist, Sciencewise-ERC (SC)
- Vonu Thakuriah, Halcrow Chair of Transport, Professor of Urban Studies and Director of the ESRC Urban Big Data Centre, University of Glasgow
- Jo Webb, Project Manager, Administrative Data Service, University of Essex

3. Summary methodology

HVM's methodology for the dialogue was designed around:

- A co-production approach with ESRC and the Steering Committee (SC)
- Providing excellence in all we do beginning with project management, process design, delivery and ending with reporting
- Excellent value for money
- Delivering against the project objectives within the proposed timeframe and within budget
- Ensuring the safety of personal data and the wellbeing of all participants throughout the process in line with Market Research Society guidelines and the Data Protection Act.

Figure 1 provides a summary of the key milestones within the process.

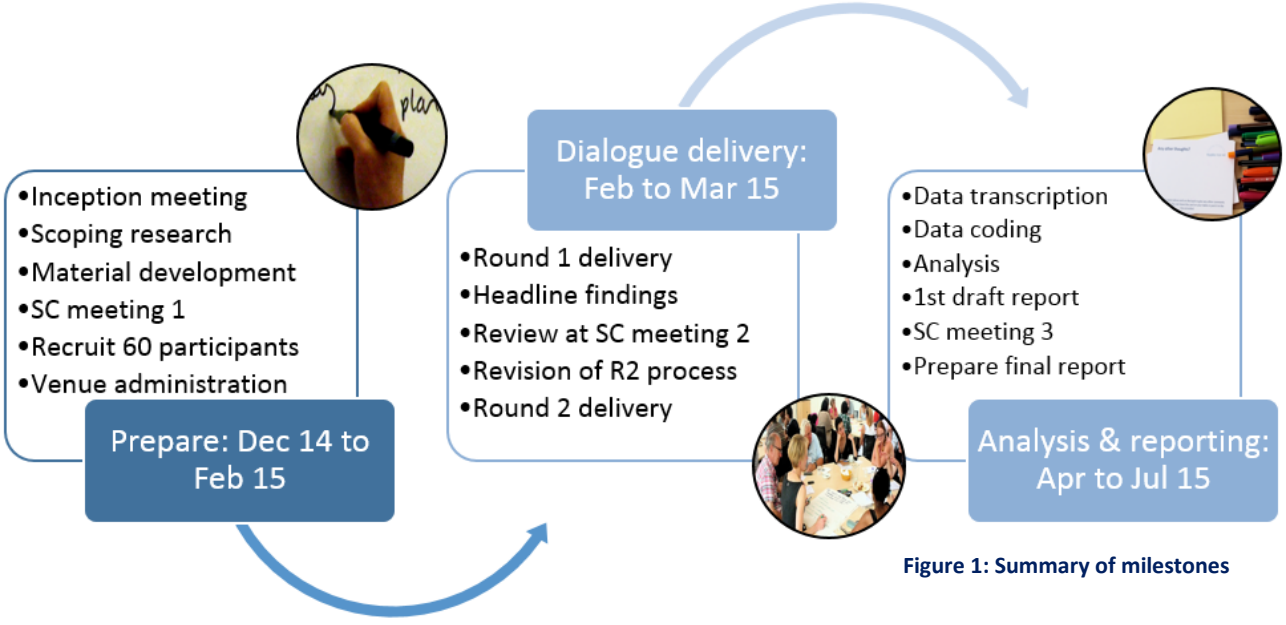

Figure 1: Summary of milestones

The methodology used is explained further in point 5 and all the tools are included in the Technical Appendix to this report.

4. Preparation

The inception meeting was held on 18 December 2014 via a conference call between Paul Meller and Maria Sigala of ESRC and Henrietta Hopkins of HVM. The key delivery dates were agreed at the meeting and the process by which the Data Centres would be involved in the dialogue. As a result Anita van Mil, Project Director at HVM developed a detailed project plan and the work on scoping the content for the dialogues began. From early January interviews were conducted with each of the Directors and Principal Investigators at the ESRC Business and Local Government Data Research Centre (BLGDRC), the Urban Big Data Centre (UBDC) and Consumer Data Research Centre (CDRC). The latter was held as part of a CDRC team meeting, others were held via telephone. The transcripts from these conversations greatly informed the design of the process and pre-materials. The very initial drafts for the dialogue were discussed at the first Steering Committee meeting held on 12 January 2015 and the broad process was approved. The final process plan was signed off via email by the Project Team with detailed comments integrated in to the final plan (see Technical Appendix section 3 page 16).

5. Recruitment sample

Participants were recruited to take part in the dialogue by Acumen Fieldwork, a trusted HVM partner. HVM developed an initial recruitment specification (see Technical Appendix section 2.1 p. 6) which was approved by the Steering Group before being put in to the field. In summary Acumen were asked to recruit for 6 workshops 2 each in Glasgow, Colchester and London on Saturdays roughly three weeks apart between 31 January and 21 March 2015 (see figure 2). The intention was to recruit 66 for 60 participants to the dialogue, 22 for 20 in each location. The criteria for recruitment enabled a broad social demographic to take part in the dialogue. In addition potential participants were asked two test questions:

Test question 1: Here are some of the ways private sector companies collect data about people. Which, if any, have you decided ***not*** to take up because of concerns about how your data will be used?

- Store cards/ loyalty cards
- Debit/ credit cards
- Oyster/ travel cards
- Smart cards (utilities)

Test question 2: How many credit/ debit cards, store / loyalty cards do you regularly use, where 'regular' means once or more per month? (Include any Oyster card that is used to pay for travel, but not free travel passes).

- Less than 3
- 3-5 cards
- 6 or more cards

The answers to these questions enabled the fieldwork team to recruit a range of participants from those who were wary of their data being collected by the private sector to those who were comfortable about such data collection. Participants were paid an incentive for their attendance at both workshops.

The fieldwork was successful in meeting the criteria for a range of views on personal data collection and the broad demographics. The final total number of participants was on target at 62 (22 Glasgow, 19 Colchester, 21 London).

6. Dialogue process

The round 1 workshops took place between 31 January and 28 February 2015 and the round 2 sessions between 7 and 21 March 2015 (see figure 2) following the detailed process plan designed for the purpose (see Technical Appendix section 3 p. 16).

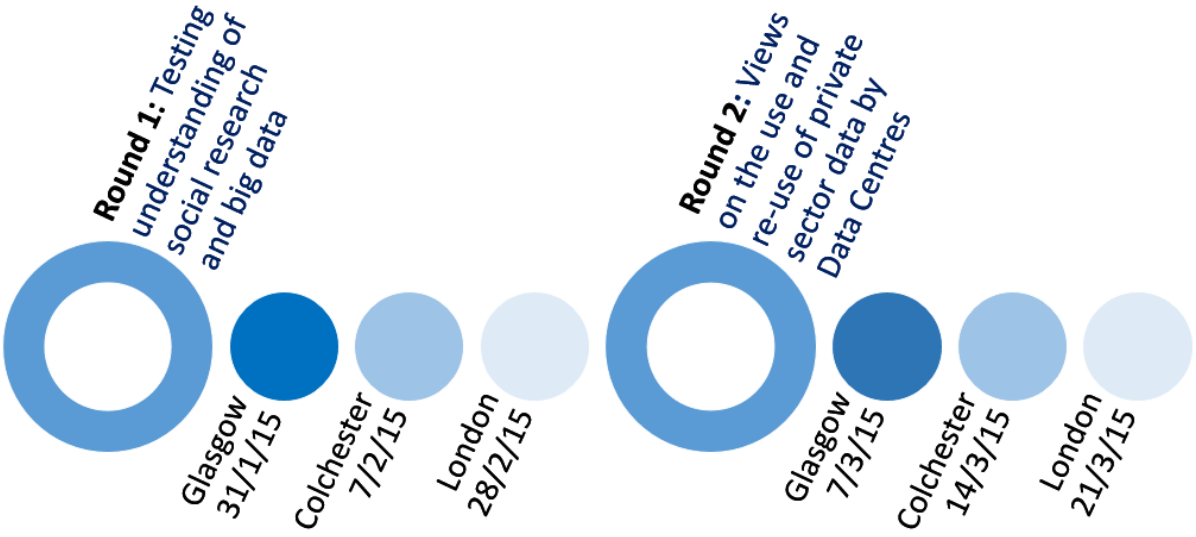

Figure 2: Aims & dates of each dialogue round

6.1 Round 1 methodology

The process was designed to test current understanding of social research and the use of big data collected by the private sector within it in round 1. The focus was the data collected by the private sector and re-used by social scientists during their research. To this end the round 1 session began with an introduction to the dialogue as a way of collecting participant views on a complex subject. It was important that trust was gained from the participants of the process, and the team leading them through it, to ensure that they felt able to speak out and air their views on the use and re-use of private sector data for research.
In the first session participants were encouraged to work in pairs and in small groups to think about a typical week day for them and consider all the times where data are given to/ taken by the private sector. They were asked to populate a clock drawn on a large flip chart with post-it notes on which they had written *what* data had been collected, placing the post-its on the relevant place on the clock to denote *when* the data would have been collected. This process led in to a discussion on the extent to which they had previously considered the data collected about them and how such data are collected.

Having considered this without any stimulus material participants were then asked to hear/ watch some contextual information to inform the rest of their discussions. These were:

- *What is social science*[4] an animated film produced by ESRC
- *Big Data and its value for social research* film produced by HVM
- A presentation on the work of the Data Centre in the workshop location by each of the Centre's Directors/ Principal Investigators.

This provided the context for the dialogue and led in to a detailed discussion on the use and re-use of private sector data by means of a process called DEMOCs. Democs (Deliberative Meetings Organised by Citizens) is a deliberation method, initially developed by the New Economics Foundation (NEF) that takes the form of a card game enabling small groups of people to learn about and discuss complex scientific, political and ethical issues of which they have no specific prior knowledge.

Working in two groups, a series of cards were read out by group members. The red group in each location looked at stories about:

- High Street consumption
- Financial data
- Transport & movement

The blue group in each location looked at stories around the themes of:

- Online consumption
- Energy use
- Communications including social media

[4] http://www.esrc.ac.uk/news-and-events/videos/wiss-videos.aspx

Each of the themes was devised to incorporate some aspect of private sector data collection and/ or social science use of such data. The full set of cards is included in the Technical Appendix (see section 4 p. 44). The methodology begins with the reading out of fictionalised stories under each of the themes. Then each group is given the same set of information cards. These are facts about using private sector data for social research drawn from existing evidence and reliable sources. Finally the group reads out context cards. These are different people's viewpoints and opinions on big data and social research. They do not cover every issue that might come up in discussion. The sources from which they were drawn are included in the information provided to participants (and included in the Technical Appendix p.74 and p.91). The context cards include points which are intended to provoke discussion. It is made clear to participants that they may not agree with all the points raised on the context cards.

After reading out each set of cards participants are given an opportunity to discuss them, challenge their contents and express their own views in relation to the thoughts they provoke. These detailed discussions led to the end-point of the session during which participants were asked to consider what they believe to be the really important issues for people working at the Data Centres to consider when they use/ re-use data collected by the private sector. This led in to discussions on the extent to which there are benefits for society in social scientists having access to private sector data.

In preparation for round 2 participants were asked to keep the dialogue in mind and bring notes on anything they have seen or heard through the media, or discussed with friends, on the use of data by the private sector and/ or social scientists.

6.2 Round 2 methodology

In the round 2 workshops the intention was to explore in greater depth people's views on the issues. After initial discussions to get people re-focused on the subject, the Data Centres gave a presentation on an area of interest to their work as well as explaining the user data journey. The presentations varied according to the work of the Data Centre in each location and were as follows:

- **Glasgow**: The growth of private sector renting and its impact on social housing
- **Colchester**: SME loans stored by a bank and used to study financial constraints among SMEs
- **London**: Using business data: a study of tourism

Following the presentations and questions on them participants were asked to consider two plausible future scenarios for 2030. In each location the blue group considered a Citizens' Exercise Requirement scenario and in the red group a scenario around Blue-tooth enabled devices. These were devised with the help of Professor Paul Longley at the Consumer Data Research Centre and Professor Nick Bailey at the Urban Big Data Centre. The purpose of the scenarios was to free-up participants' thinking so that they could consider potential uses of big data for social research both now and in the future. From the stimuli of the presentations and the scenarios participants were asked to consider data in terms of:

- Ownership
- Storage
- Means of access
- Acquisition

Working with the observers present from the ESRC and the Data Centres participants were asked to use a timeline to describe how they saw these issues working now and in the future. Additional information cards were also provided to help participants to discuss these issues meaningfully. The full set of materials used is included in the Technical Appendix. A discussion around the timelines produced by participants allowed us to move on to a discussion about what, in the view of participants, are the opportunities and risks in using private sector big data for social research. Participants were also asked to test the acceptability of the criteria to be used to access, store, own and acquire now and in the future. The discussions ended with participants considering if anything is missing from the criteria set-up in this early stage of the Data Centres' existence.

Participants presented their findings to the observers and specialists present in the room. The ESRC and Data Centres responded with their thoughts on what they had heard during the discussions and its value to the Data Centres.

7. Dialogue tools and recording

The dialogue tools were tailored for the purpose. HVM's brief from the Steering Committee was to avoid having very standard uses of case studies with someone presenting and then a discussion on what they had said. HVM were specifically asked to use case study material creatively hence the integration of DEMOCs designed to review complex ideas and issues without any prior knowledge. In addition an adapted form of back-casting enabled participants to discuss issues and then place them on a time-line to consider what

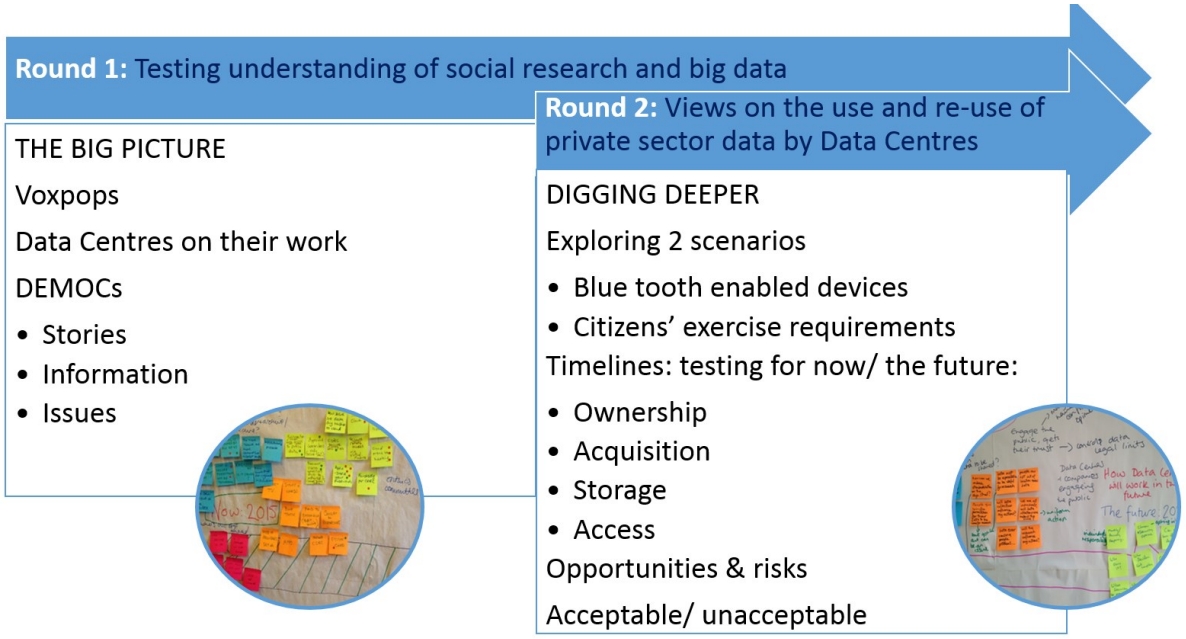

Figure 3: Design tools

might change in the use and re-use of private sector data for social research between now and 2030.

A summary of the key dialogue tools used is provided in figure 3.

HVM used a variety of methods to record the views of participants. These are designed to enable facilitators to engage in meaningful conversations with a public group about their views on the use and re-use of private sector data for social research. Individual and group reflection techniques were employed including:

- Flip chart note taking
- Audio recording
- Participants recording their own words on post-it notes
- Any other thoughts card for participants to record things they do not wish to say out loud in a group

8. Analysis

HVM uses a process for analysing the data which ensures that the starting point is the views of the public as articulated in the dialogue sessions, rather than a hypothesis for which evidence is being sought. The team's aim is to look for patterns of similarity and difference of views which can be analysed per dialogue session and across each of the rounds. Using this approach, the steps for analysis were as follows:

1. Identification of key themes

In which each of the HVM team members separately reviewed the data write-ups noting their understanding of the headline themes around which the data can be collated.

2. Agreement on themes, codes and categories

Once each team member had clear themes in mind the team discussed them coming to agreement on codes which define similar content around which the data can be grouped and clear findings can emerge.

3. Proposing a theory

HVM has, in this report, identified the key themes that emerged from a detailed discussion of the issues, summarised them and produced summary recommendations for each theme.

Working both as individuals and a group to produce the coding frame and the categories and testing them as the process evolves works well with a public dialogue. It allows the findings to emerge from the data and those findings to be validated in an iterative sense through group discussion. The dialogue findings are presented in the subsequent sections of this report.

Dialogue findings

1. Views on data collection by the private sector

Summary

The majority of participants in the dialogue demonstrated an awareness that their activities as consumers generate a wealth of data about them which is then at the disposal of private sector companies. The use of the internet, online shopping, loyalty, bank, and travel cards featured a lot in people's discussions on the data generated for use by private sector companies on a daily basis.

Although many participants were taken by surprise at the extent and size of data collection by the private sector, there was a general awareness as the dialogue progressed of how valuable these data are for private sector companies, particularly for marketing purposes. There was also an awareness of how such data enable companies to fulfil their organisational objectives. The majority of participants said they did not object to their data being used by private sector companies recognising that this might enable companies to run their organisations more efficiently and effectively which would benefit their customers.

A minority of participants voiced their concern on the possible impact of data use, particularly data identifying the individual, on their privacy. Many acknowledged the potential risks to privacy and data security but not all of those who expressed concern saw themselves as having the power or the desire to do something about it. A very small minority of participants were very clear about the steps they took to avoid their records being recorded on systems. However, in general there was an acceptance that it is very hard to keep all data private and the majority of participants accepted that data collection by commercial organisations has become an integral part of our society.

At an early stage in the first round of the dialogue participants were asked to consider a range of data-related information cards (see Technical Appendix p.57-75). From this discussion the idea of data linkage was particularly picked up as an area of interest along with the Data Protection Act (DPA). When presented with information on how various data can be shared and linked among private sector providers and others, participants acknowledged the increased risk of personal identification and, in a minority of cases, felt that such data capture was frequently unwarranted. On the other hand, linked data that did not contain information which could identify the individual was seen as less sensitive and thus its collection was more acceptable to participants. Participants were particularly intrigued by the principles within the DPA that included keeping data secure and safe and using data in a way that is adequate, relevant and not excessive.

At the beginning of the first round of discussions participants in the public dialogue were asked to populate a large clock with Post-its indicating what time individual data are given to or taken by private sector companies. The dialogue participants worked in pairs and in discussion covered a wide range of data being collected through the use of digital radio and TV, internet, social media, apps, mobile phones and GPS tracking devices. Travel cards, store loyalty cards, bank cards, library cards and CCTV cameras were mentioned as well.

The exercise provoked discussion about the vast amount of data collected with the majority of participants demonstrating surprise about the extent to which data are collected by private sector companies,

Data are watching you 24/7, it's like a camera. – Colchester

There was so much that you don't think about in everyday life. – Glasgow

Some participants were more surprised than others. In each small group a range of views was represented, as is demonstrated by the following quotations from the dialogue in Glasgow,

I think everybody knows. - Glasgow

I hadn't really thought about half of these things. – Glasgow

The same participant went on to say,

I could say it makes me feel vulnerable but no, I'm quite easy with these things. – Glasgow

Whereas another participant said,

I wasn't really aware of how much data was getting collected on a day to day basis and that was a wee bit of a concern for me. – Glasgow

For some, particularly those who did not grow up using digital technologies, privacy concerns led to minimal participation in data sharing,

I try to avoid using the internet for purchases specifically because I don't want my data collected and then used for sales purposes afterwards. Colchester

Whereas the views of most of the participants, who had grown up in the internet age in the same small group for the most part, chimed with the following comment,

All the data on there, it all makes your life easier. - Colchester

The majority of participants accepted that data collection by private sector companies has become an integral part of our society. Many felt strongly that they had no control over it,

At the end of the day there is no way you can opt out of giving data unless you live like a hermit in the middle of an island. You've got no choice. The genie is out of the bottle, you can't do anything about it. It's just the way we live. - Colchester

Having learned more about big data throughout the discussions some participants said that they were more concerned than before about the extent to which data are being collected,

You realise with all the store cards, bank cards and all the bits and pieces, that data is being collected and the amount of phone calls you keep getting, do you want this? Do you want that? But going through it last time like we did, it really did bring it out, it's a bit frightening really for me. - Colchester

For some participants data collection was more acceptable when it makes an individual's life easier or leads to financial benefits,

I don't mind them having all the information on me as long as it's going to save me money. Like, for instance, I've just changed my credit card because I'm going to pay 0% interest for so many months… - Colchester

Not everyone agreed with this view, with some participants being very clear that they avoid sharing personal data wherever they can. The participants who mentioned this would take steps to avoid data being collected about them, such as not registering a travel card,

I won't register an oyster card […] because it's literally just a tracker. […] I refuse to because I don't want that data going to whoever to know that I'm getting on the bus. It's unnecessary. – London

Or making online purchases,

I avoid purchasing stuff online because I don't want my data to be stored. I don't want calls, I'm sure it gets distorted on its journey. - Colchester

This is particularly so when they feel that giving this data reveals too much about them as an individual, would result in unnecessary intrusions in to their lives, or might get distorted and record inaccurate

information about them. For the majority of those that felt this way, though, there was a reluctant acceptance that it is very hard to keep all data private.

Others were less concerned and did not feel that their individual data are targeted,

I just think all these private companies collect as much data as they can. I'm not too bothered about me personally being tracked or monitored, I don't really care if they know where I've been on my Oyster card or which websites I've been to. I think that they're looking for big trends so that they can tailor their marketing and tailor their products so they can boost their sales, it's not really about individuals. - Glasgow

There was a general awareness that data based on consumers' browsing history and in store loyalty cards is used for marketing purposes,

It's just marketing in general, like Amazon suggests products that you might like after you've bought one. - Glasgow

With shopping they look at your buying habits. They know that I've bought Cravendale milk over the last 4 weeks so on week 5 I'll get a voucher saying 50p off Cravendale milk. It encourages spending. - Colchester

Many participants acknowledged the potential risks to their privacy and the security of their data, but not all of those who expressed concern saw themselves as having the power or the desire to do something about it. In recognising these risks one London participant summarised the issue as follows,

The biggest risk is the loss of your privacy and security of your details. - London

A minority of participants felt strongly that they no longer have a choice now the internet is an integral part of our lives,

My friend's very private but she's actually got no choice now, she's on the internet so perhaps she hasn't thought of everything. - Colchester

Others said that we do have a choice and were concerned that younger people are not as mindful of privacy as the older generation,

When you go online you give away data, if you don't like that, you shouldn't use it. We do have a choice. The younger generation cares so much less. - Glasgow

Although there was support for this view, participants also talked about a certain ambivalence towards the issue. There was some discussion as to whether knowing about these concerns, but not changing the decisions they took about sharing data, was a good or bad thing,

You become immune to it and you come to accept it. If I want something I just take the plunge and say oh well I've got nothing to hide so go ahead. But if you really look into it, it's not a question of you've got nothing to hide, it's your privacy. – London

1.1 Data sharing and linkage

Having been presented with information cards covering a range of topics relevant to the big data discussion (see Technical Annex pp.43), the information card on data linkage, provoked discussions amongst participants about privacy and security. All groups across the three locations talked about their concerns regarding data being shared without consent. They felt that data linkage is an increased risk to an individual's privacy with the linked data potentially revealing more than one would like to reveal. Someone in London said,

I don't care that they know that I buy 3 chickens instead of one but it goes on to other things […], to different companies, house insurance. They can say 'this lady, she's spending this amount of money so she can afford this'. - London

Many participants in the dialogue felt uncomfortable about the extent to which data sharing might lead to a society in which privacy doesn't exist anymore.

For me, I couldn't care if someone knew I was a size 11 shoe. As long as it doesn't have my name attached to it, it doesn't bother me too much. Whereas if they know I got up every morning at seven o'clock and got the bus and other things about my day to day life, that's a wee bit different. I think it depends on what information [is being collected and linked]. - Glasgow

In some of the groups people talked about the risk that data linkage can lead to potentially distorted profiles of individuals. As a participant in London said,

The more data you add the more it's creating this sense of identity of each person, so it's almost like everyone's got this data avatar that's building up as we get older. - London

The feelings in this small group were succinctly summarised by someone else,

What people are worried about is that it's not going to be kept just within [the organisation data are shared with]. It might get sold to insurance companies, employers and this is where people want to know that it's going to be safe [to give their data]. - London

1.2 Data Protection Act

Participants were particularly intrigued about the principles within the Data Protection Act, as these were presented to them in one of the information cards (see Technical Appendix p.57), and included keeping data secure and safe and using data in a way that is adequate, relevant and not excessive.

Things like 'used in a way that is adequate, relevant and not excessive' what does that mean? Who decides what that is? Do you get to decide that yourself when you're doing research? - London

Other questions ranged from how solid the Act is; how often it leads to convictions; and how it keeps up with changes in society, i.e. whether it stretches to global transfers of private sector data.

In general, participants wanted to know more about how decisions to collect, store or share data by the private sector are being made on the basis of such principles and what sanctions are in place and used to enforce the legislation.

2. The use of private sector data for social research

Summary

In response to presentations by the directors and other senior academics from the Data Centres on how they use private sector data for specific projects, participants expressed very positive attitudes to the use of private sector data for social research purposes. Participants were very appreciative, for example, of the impact of social research using private sector data on improving local, regional and national policies and delivering more effective services which benefit local communities.

There was a perceived risk among participants that these benefits might not be realised if the data was left solely in the hands of commercial organisations, rather than being shared with, for example, social scientists and the Data Centres.

The opportunity to engage participants with some of the academic research agendas of the three ESRC funded Data Research Centres increased participant appreciation of the value of this data for academic research, public policy and services including health and social care, education and transport. In this context the majority of participants found it acceptable that individual level anonymised data are being shared and linked. Some participants felt that the use of personal data for social research is justifiable, particularly if it benefits certain groups. Most participants further, found acceptable the analysis of data that does not include personal details but focusses on trends and patterns.

Some participants raised the issue of ethics and the importance of having safeguards in place to ensure that linking private sector data for social research and other purposes is legal and ethical. The expertise and professional reputation of those undertaking social research enabled by the Data Centres was seen as reassuring.

Participants in the dialogue were generally positive about the use of private sector data for social research purposes,

There are huge benefits aren't there? I'm not really sure how you could run a society without it to be honest, it's all planning for the future…you wouldn't be planning, you'd be guessing wouldn't you? – London

There was an appreciation that society benefits from research which draws on private and public sector data, particularly in the context of health and social care, education and the environment, which according to some participants can't be left in the hands of the private sector only,

It's really important for protecting public [benefit]. Think of health, if you just leave it in private sector hands, you've got a mismatch then between one group's ability to use information and to a point manipulate society in a certain direction versus things that we may want that they may just run roughshod over. It's to protect socially agreed outcomes. - London

Others emphasised the benefit of using private sector data for resource planning purposes, including infrastructure services,

Informed decisions on allocation of resources, whether that be money or people. For example, how old are people living to? What sort of arrangements are made at the end of the life – are we going to need loads more cemeteries as an example. – London

It can make things seem more apparent earlier so if you're looking at travelling you can see an increase over the last five years, you can assume it's going to carry on and change the infrastructure in advance rather than waiting until it's a problem. – Colchester

I found it really interesting what the woman was saying from the university. She was talking about how they use data to plan the city and how things work in the city. […]They were telling about how data can be used to change people's lives. […].When you think about the good things, we need them… - Glasgow

One of the groups in London even said that data should be valued more,

Data should be better valued: they do a lot of good without us realising. It's the tiny bits and pieces we give away which contribute to the bigger picture. – London

2.1 Personal versus anonymised data

In the context of privacy participants had reservations about the use of personal data collected by the private sector for social research purposes. Some participants appreciated that in some cases the use of personal data is justifiable for social research, particularly if the research aims to benefit certain groups.

Sometimes it's important to know who the people are, sometimes you need to know which groups need help, you need to know who those people are so it's not always a bad thing. - Glasgow

Participants further found acceptable the analysis of data that focusses on trends and patterns and not on personal details.

You'd want data to be analysed on a general level, so looking at trends and patterns, not on a personal level. - London

This became very clear in discussions about one of the hypothetical scenarios for the future in which a Data Centre is devising means of assessing whether people meet their Citizen Exercise Requirement to contribute to increased health and wellbeing of the population and reduced spending on health and care services (see Technical Appendix p. 100).

In order for [this scenario] to work it has to be based on an individual person and their individual actions and that is what's so concerning in terms of accessing data because then there's not that kind of privacy to it. - London

When it's anonymised that's not a problem, it is when it's not anonymised. - London

2.2 Research ethics

The majority of participants were in favour of very strict controls when private sector data are used for social research purposes due to concerns about the sheer volume of data and profits being made from linking data. In Colchester there was a call for a 'data middle-man' who assesses the provenance of data,

There should be a middle-man that looks at everything that exchanges and goes…you can't exchange money, large amounts without somebody noticing and someone saying something so why should you be able to exchange [large volumes of] data? […] I know there is legislation and things but it's not quite as strict. The Data Centres do have a strict way of doing it for a reason but the private sector don't have to follow it. - Colchester

For some, even those with knowledge of the Information Commissioner, an institution like a 'data ombudsman', a 'data watchdog' or even a 'data minister' for data collection covering both private sector companies and public sector organisations would be reassuring,

Is there actually an ombudsman for data collection to check that [data management practices are] ethical? Perhaps then things wouldn't happen where data can be nudged to go towards what you want it to do and make it more ethical. – Colchester

2.3 Trust and expertise

At the start of the dialogue most participants had low awareness and understanding of social research and the use of big data for social research purposes. Deliberating on the use of private sector data by the Data Centres led participants to the conclusion that the process of acquiring, storing, preserving and accessing private sector data for social research comes with substantial responsibilities. Across the three locations participants expressed the view that there ought to be a greater recognition of the data science profession in the form of a big data science kite mark to develop a reputation of trust with the public,

I would like it to be so that the Data Centre staff were recognised as part of a professional body of people and that they had a certain qualification that was so highly valued and respected that everything that was done would be like 'wow' we can trust them you know. - Colchester

3. Qualities of an acceptable data infrastructure

Summary

In the second round of the public dialogue senior academics from the Data Research Centres presented the data infrastructures and various safeguards to keep data and access secure. The issues and questions raised by participants in reaction to this information provide a useful insight into the main attributes of a data infrastructure that is acceptable (or not) to the public. Overall participants were appreciative of the infrastructures in place at the Data Centres.

There are three main points to raise here:

1. It is important to those who took part in the dialogue that a data infrastructure funded by public funds and relying on private sector data operates independently of government biases and of the interests of commercial organisations.

2. Participants were reassured by a data infrastructure that has in place strong safeguards to protect privacy, including clear vetting procedures for researchers and penalties for data breaches. However, they recognised this needs to be balanced with the need to progress social research projects.

3. Participants also indicated that impartiality and expertise should lie at the heart of decision making about data acquisitions and research approvals.

In each location the Principle Investigators of the Data Centres made a presentation about the purpose of and governing principles managing their research. The public interacted well with the information provided and asked a range of questions to gain a more detailed understanding of the data journey. It is important to note that is in many public dialogues the more participants heard about the subject, the more they understood the work of the new Data Centres and their emerging role in social research and public policy. The following is a summary of participants' views on some of the data management processes at the Data Centres.

3.1 Independence, impartiality and public participation

Although participants were given information about how data are handled once held by the three Data Centres (see Technical Appendix p.92) this knowledge didn't take away all concerns about accountability and independence of the Data Centres and the ESRC. Some participants questioned if their funding position enables the Data Centres to operate independently from Government,

In the Data Centres you are governed by the government […]. You can't be biased towards them but you can't do what […] you want really and have no consideration for the government, can you? - Colchester

Impartiality of decision making was discussed in the context of the composition of Data Acquisition and Research Advisory Boards. It was important to participants that project approval is granted by independent and qualified people. One of the groups in London made the point that the Boards need to be representative of a wider constituency than the research community to ensure that the public at large feel reassured,

A broad mix of people on the ethics committees so that a broad public view is represented and [can oversee] decision making. - London

Participants wanted clarity regarding the relationship between social researchers and private sector companies. As a participant in London said in response to a fictitious story about Otis Weatherby, an online retailer working in partnership with a local university to research customer behaviour patterns (see Technical Appendix p. 45),

Even though the project sounds very positive, what are the links between the researchers and some of the high street retailers that are obviously interested in this [research]? I would want that to be a really clear delineation before I could really trust the project because obviously there is a risk there. - London

Someone else agreed and called for what they perceived as being a more objective framework for data scientists to work within,

The link between these big chains and town planners and academics is troublesome. […] It needs to be based on stronger legislation rather than ethics because ethics is a very personal thing. What I may think is ethical, you may not necessarily and it would be very easy when you've got all this information to pass it on to big supermarkets. – London

3.2 Strong but reasonable safeguards to protect privacy

Across the three locations dialogue participants felt reassured by the data acquisition, access, and storage processes that are currently in place at the Data Centres,

I think it's acceptable. Clearly they've made it very difficult to use the data, I'd like to see that continue. - London

As mentioned before, security of data and privacy were the most important issues for participants in the dialogue. A fictitious story about a social researcher who is considering linking loyalty card data with other data sets (see Technical Annex p.51) demonstrated that participants in the dialogue had concerns about the de-identification process conducted by private sector companies or researchers. As someone in London said,

Can they give assurances that data is not traceable back to a particular consumer? - London

To allay privacy concerns the public needs reassurances from the Data Centres about the data curation process, specifically about the handling of personal data,

At what point in the data collecting story does it lose the personalised information? Big data is a broad term, at what point is it not personal anymore, when does it lose your name? - Glasgow

An important finding of the dialogue was that some participants recognised that there is a fine balance between security of data and regulation that is too tight and hinders progress in social research. One of the groups in London said,

You've got to have a way of allowing people to develop new ideas on the socially beneficial side of things without sitting there for two years waiting for an ethics committee to be formed or something like that. There's a balance between protecting data …and enforcing the controls over it and at the same time still getting the social benefit. Too tight laws just slow things down as opposed to actually being helpful. - London

It was felt that it is the responsibility of the Data Centres to have the highest possible safeguards in place to ensure the security of data held by them at all times and balancing this with the need for research that is important for society.

3.3 Vetted researchers and staff

Most participants felt positive about social researchers accessing private sector data as long as they have to adhere to very strict guidelines, particularly in the context of research involving sensitive data,

To have clearance (of researchers) before you access data. - Glasgow

Particular reference was made to the de-identification process,

[Data Centres] are very keen on anonymised data but there's still someone doing the anonymising who would have [access] to that information. […] It needs trustworthy people in there doing that. Lots of checks, they need to be vetted. It makes it sound very safe but there's still actual people involved. - London

Clear vetting procedures for staff and researchers, particularly at the stage where data are de-identified and accessed were seen as a priority, as are clear agreements about penalties for non-compliance with Data Centre processes,

What is the penalty or the fine if I was a researcher and I misused the information? It was brought up with the cold callers [that penalties] are ineffective, they make no difference…so is [what's in place at the Data Centres] effective? – Glasgow

4. Views on key themes: Data acquisition, storage, access and ownership

Summary
Once participants had familiarised themselves with the work of the Data Centres and the potential benefits of using private sector data, they were presented with specific information on Data Research Centres' plans to acquire, store and allow access to data. They reflected on four key themes: data acquisition, storage, access, and data ownership. Overall, participants were supportive of and positive about the Centre's plans to acquire, store, and allow access to data.

Data acquisition
There was consensus that the Data Research Centres should have effective procedures for acquiring data that are accurate, relevant and of sufficient quality. The dialogue findings did not reveal widespread support for payment for data sets, particularly if participants thought that the companies allowing access to data might make a profit from the process. A large minority of participants expressed the view that companies have a moral duty to give data free of charge particularly if they are regulated companies, such as those in the energy and transport sectors, and if the research is of public benefit.

Data storage and preservation
Participants had very low awareness of data storage practices. Most had difficulty accepting that digital storage is as safe as, or even safer than physical storage. Discussions indicated that there is a need for clear information about data storage processes at the Data Centres. In order to trust the process, the public need to know:

- More about how data are stored and destroyed
- What data are being stored, for what purpose and for how long
- What security measures are in place.

The public also need to be reassured that the data storage systems at the Data Research Centres will enable future generations to access the data.

Data access
Participants were broadly acceptant of the different safeguards to data access depending on the sensitivity of the data. For most their front of mind response to data access principles at the beginning of the dialogues was linked to security concerns such as fraudulent use of data and identity theft. As a consequence some participants were more in favour of secure physical settings for access to data rather than remote access through a virtual machine.

What concerned participants most about data access is what happens when controlled data are linked. Many of the concerns were alleviated as they familiarised themselves throughout the dialogue with the access processes that are currently in place and being planned at the Data Centres. Similarly, participants were willing to make a trade-off between concerns about not having the opportunity to consent to the use of private sector data for social research purposes and the benefits of social research for society. This demonstrated that trust can be built with improved communication about the data access procedures, in particular in relation to more sensitive personal and individual level data sets.

Data ownership
Like data storage, data ownership was a complicated concept for most participants to grasp. Although some understood clearly that data ownership transfers when data is shared with private sector companies, many believed that private individuals own their own data. An important concern for most participants was that the public doesn't know who is holding data on them. They called for improved communication about what data are owned and/or used by the Data Centres.

Once participants had familiarised themselves with the work of the Data Centres and the potential benefits of using private sector data for social research during the first dialogue, further consideration of the data management processes on the second day led to the following findings.

4.1 Data acquisition

There was consensus amongst participants in the dialogue that private sector data being acquired by the Data Centres has to be as accurate as possible,

If [private sector data] is being (re-)used they should ensure that it's up to date. It could give inaccurate information. – London

It's important that the Data Centres verify the provenance of the data they acquire,

The people that are using the data should know its origin so if you get data from someone else you know the data's origin. - London

One of the groups in Colchester said they felt that acquisition of inaccurate data is a key risk for Data Centres, as accurate information is not always shared with data controllers,

They could be vulnerable to the sources they get their information from, the data may not always be accurate or honest. […] Obviously they'd go through criteria and a test as to how they get that information but if they've been given false information… The Data Centres are not forensic auditors. It's outside of their control. - Colchester

In response to a fictitious story about a countryside campaigner who has concerns about the reliability of his data (see Technical Appendix, p.54) one group said,

If you don't know where the data comes from and what the limitation of that data is you can't interpret it, there's a great danger of drawing false conclusions…you need to make sure the data is up to date. - Colchester

The same group discussed the extent to which data can be manipulated and how that impacts on the quality of data being used by social researchers,

I was thinking about the data owner...can they manipulate data to the wrong kind of advantage? Which leads on to data linkage, if you've got one lot of data which has then been modified for someone's benefit which is then linked to someone else's data you're going to get possibly a very false reading. - Colchester

They felt strongly that processes have to be in place to ensure that data acquired from private sector companies pass a quality test before being accepted at the Data Centres,

If you're going to get data from private sources, you need a standardised methodology to assess it so you know that you're getting the right information and that it's not someone else's idea of collating information. - Colchester

Support for social research using private sector data sets didn't extend to widespread approval for payment of datasets by the Data Centres. In discussions about the data acquisition procedures at the Data Centres many participants expressed concern about private sector companies making money out of selling data,

I don't agree with it, money can be the wrong kind of incentive. - Colchester

This sentiment was linked to a general sense that the public are not informed about who shares their data with whom and for what purpose their data is being used,

I don't think there is a massive issue with data being used for social research, [but] people don't feel comfortable with it being used by people to make money out of it. It's the selling of information [by private sector companies] and people not knowing where it's going, what it's been used for. – Colchester

Another concern was that private sector companies might potentially charge large sums for the sale of data packages. Some felt strongly that it should be compulsory for private sector companies who are in receipt of public money to surrender data for free to the Data Centres to ensure greater public benefit,

There should be legislation in place to ensure that money wasn't being made in that kind of way. That the information was free, that the government had the power to access that information for the benefit of society free of charge from the private sector. - Glasgow

Others said that companies have a moral duty to give access to data for the benefit of social research,

I don't think it is right that they [the Data Centres] should buy data, it's public money so they should be spending it on the public. - London

I just feel that money puts a different perspective on it. It changes the game, it changes people's attitudes. If it's used for social policy I think it should be freely given. - Colchester

This was balanced by the view of some that the Data Centres operate under strict guidelines and are therefore better placed to make a judgement call on this than participants in the dialogue,

It's their budget, they've got that position through merit or whatever. I think they've got the right to split the money in whatever way according to the aims and objectives [of the Data Centre]. I'm very comfortable with them spending it wisely. - Colchester

The general feeling across the locations was that Data Centres should exercise caution when buying data from private sector companies. Equally selling data sets should be avoided to ensure public and voluntary sector organisations have opportunities to access big data as well,

Data should not be sold as only the ones with the most money get more access to data. - Colchester

4.2 Data storage and preservation

Data storage was not an issue many participants had given any consideration to before the first round dialogue session. Most had very little understanding of the data storage process in general.

All members of the public discussed their lack of knowledge about where data are being stored and who is in control of data storage,

We don't know where the information is stored and who's in control of it. - Colchester

Participants said they'd like to understand better how data is being stored at the Data Centres,

We need a physical understanding of where it's stored. - Colchester

Participants were generally suspicious of storage 'in the cloud' as they don't understand what the cloud is or where it lives. Concerns were raised about the risk of losing data,

If the cloud bursts, it's not in a container somewhere, it's not in a tower, it's gone. - Colchester

Participants had difficulty accepting that digital storage is as safe as or even safer than a physical storage space. A participant in Colchester summarised the views of others as follows,

I think everyone would feel a lot more comfortable knowing where it is and what it is – literally where it is not just the cloud. – Colchester

Data sets created at the Data Centres should be stored in the UK or the European Union, according to participants in the dialogue,

[Big data] should be stored in a country governed by a relevant data protection law. [Data sets] made in the UK should stay in the UK or within the EU, a governing body has to cover it. It can't go from here to Alaska. - London

Although participants made most of their comments about security concerns in the light of data storage in general, the dialogue showed that there is a need for clear information about the data storage and curation processes at the Data Centres. The public needs to know how data are stored and destroyed and whether systems are future-proof, for how long data are being stored and for what purpose,

How long is the data stored for? And is it then continued to be stored for the original purpose? So from a personal viewpoint I give my permission for my data to be used today, and it's stored for five years, in five years' time can someone then use it for an entirely different purpose? - London

All participants in the dialogue believed that data will never be 100% secure, whether they are stored by public or private sector organisations,

I'm sure there are security protocols, but the hackers always seem that one step ahead. So none of it is completely secure, it seems. - London

They urged the Data Centres to future-proof their systems on an ongoing basis to ensure that data is secure. Equally they were concerned that the data are available for social research purposes in the future,

It needs to be evaluated for its future use. It would be awful if in 100 years' time stuff that would be extremely valuable [to society] is not there. - Colchester

4.3 Data access

Having listened to presentations by the Principle Investigators from the Data Centres, which included information about the difference between open data, safeguarded data and controlled data[5] participants in the dialogue considered issues around access to data. They were broadly acceptant of the distinction between the three access levels. Throughout the sessions however, it became clear more clarification is needed about how Data Centres' work with the more sensitive, personally-identifiable, data (i.e. controlled data).

4.3.1 Security of access

For most participants their front of mind response to data access principles was very much linked to security concerns such as fraudulent use of data and identity theft. As such the discussions about access mainly centred on safeguarded and controlled data. As a participant in London said,

The problem isn't so much that TfL [Transport for London] have the information, it's who else can access it. Even if they don't sell it, hackers can get into it, it's constantly in the news, people stealing credit cards. - London

Not knowing who has access to data is for what purpose is at the heart of people's concerns,

That's the whole point you don't know who can access data. Why are they accessing your data? And who are they? - London

Concerns were higher prior to having read the Information Cards about information governance policies and processes at the centres (see Technical Annex p.93). In Glasgow one of the groups said in round 1,

Just thinking about what the university's policy might be. We don't know who Joe Blogs is sitting in front of his computer […]. And what can he take home at night and do whatever he wants with. - Glasgow

Whereas the same small group said after been given information in round 2,

The process in place as to who's actually getting to use it and stuff like that […] seems to be set up that it's pretty secure and that not just anybody can walk in and get this information. - Glasgow

[5] For an explanation of the definition of open, safeguarded and controlled data presented in the public dialogue see Technical Appendix, p.93

Some participants were more in favour of secure physical settings for access to data rather than remote access through a virtual machine. As one group in Glasgow said,

The virtual machine attaching data to the researcher, I guess if I'm doing it in my house, what's to stop me recording every single thing that comes up when I'm not in a safe environment [with the data].When you're in the safe haven you obviously can't record anything but I guess if you're doing it through the virtual machine you can record what people are saying without them even knowing? It might be something to look at. I think that there's more risk going to the virtual machine than there is going to the safe haven. - Glasgow

There was some confusion early in round 2 about what data researchers could access away from the Data Centres. This was cleared up by the specialists but participants confirmed that they felt more at ease with researchers going into the Data Centres,

If you go into the Data Centre physically you walk into the room, they take your phone off you, take everything off you, scan you – that makes me feel more secure. So anything you're taking away is only in their heads. – Glasgow

What concerned participants most about data access is what happens when data are being linked and therefore accessed by different parties,

These other parties are doing things with it up to certain points […] and the lines are drawn at different levels, for all the different parties. - London

However, there was generally a fairly high level of trust in the Data Centres securely accessing data and working with linked data sets. As participants in London said,

I generally felt quite comfortable with Data Centres analysing data and maybe naively would just assume that it'd be for progressive, ethical purposes. – London

In response to an information card about re-purposing of data in round 1 (see Technical Appendix p.73) of the dialogue one of the groups in London said they'd like to be informed should their data being used for other purposes,

Give us an option to opt out if the data's going to be used for something different, something that you feel you don't want to be part of. – London

Although this is not feasible for the Data Centres the strength of feeling confirms that the Data Centres will need to communicate very clearly about their data access and use procedures to reassure the public that their privacy will not be breached.

4.3.2 Purpose of access

Equally important is that the Data Centres communicate clearly why data are being accessed. As one participant in Colchester summed it up,

The data would have to be specific for whatever it was they were accessing it for. […] It would have to be specific to what the research is being carried out for. - Colchester

And in Glasgow participants said that the data should be accessible for a certain period only,

That it's just for the length of the project, that they've only got access to that as long as it's for a project. - Glasgow

Some participants were uneasy about the extent to which the work resultant from reviewing data would be quality controlled. As someone said,

It was the last sentence that put me a little bit at doubt where it says there is no screening of outputs by staff… It might be worthwhile knowing just what it is the access to those things leads to. [They] might not be doing it for the best of reasons – how they're accessing it and how they might be compiling what they're accessing. - Glasgow

4.3.3 The issue of consent

It was important for the majority of participants that consent is given for the use of controlled data in social research,

Did the people really give consent to you having their data […] and did they understand what you were going to do with their data? - Colchester

In response to the fictitious story of social scientist Lydia Millett (see Technical Appendix p.45) one of the groups in Glasgow said,

Who gives permission [for our data being acquired/ transferred to Data Centres]? Is it in the small print? Have we got a choice in the matter about whether these companies give our data to social scientists? - Glasgow

Most participants in the dialogue felt that the Data Centres should ideally only accept personal data from private sector companies if permission has been given by the individual concerned. However, having learned more about the work of the Data Centres and the benefits of social research to society there was recognition of the fine line between enabling the Data Centres to conduct social research and putting restrictions on data access processes. Participants in the dialogue were willing to make a trade-off between their concerns and the benefits of social research. This indicates that there is an opportunity for the Data Centres to communicate more clearly how data are anonymised and how those data contribute to research that leads to improved policies and services.

4.4 Data ownership

Discussions on the hypothetical scenarios for the Data Centres in 2030 (see Technical Appendix p.99) revealed that data ownership was a complicated concept to grasp for most participants. Some were confused about the difference between data ownership and data storage,

We felt that storage and ownership seem to be the same thing. That whoever stores it owns it and has access to it. – London

Some discussed that data ownership should be seen in the same light as ownership of goods,
It [data] needs to be treated more like a physical possession…It's different if you're owing something to somebody or you're selling it to them but then the ownership does change and it has to be reflected, [make sure] that there isn't any grey area on who owns what. - Colchester

Comparisons were made with the obligations that come with owning a car,

It's like buying a car, it's a physical thing and there's a piece of paper that goes with it to say whether you own it or not. And if you misuse that property or whatever it is there are consequences to that. - Colchester

4.4.1 Transfer of data ownership

Although some participants understood clearly that data ownership transfers,

As soon as you enter into any of these things as an individual you're, I wouldn't say relinquishing [ownership], but you are certainly sharing and you are no longer the only owner of your data. – London

Many believed that private individuals own their own data,

If it's about me, surely I own the data? – Colchester

Other issues raised in conversations about data ownership ranged from the ownership of data stored in the cloud, to whether companies creating apps own data and what happens to data when a company goes bankrupt. Some participants wondered if companies are required by law to inform their clients when they transfer data to another owner.

In London questions were asked about ownership of linked data and the resultant new data sets,

They [the Data Centres] are going to have data coming in, they're going to be processing it, so although it originally came from a source, the new information that's been collected, is that owned by them or does [ownership] still go back to the original [data controller]? - London

Across the three locations participants felt strongly that ownership of data is not controlled well enough and that individuals are the owners, or should be the owners of their own data. An important concern for many was that the public doesn't know who is holding data on them. There was a lot of discussion about private sector companies as the first data controller. One of the groups in Glasgow discussed feelings of anxiety around companies holding data without their explicit permission,

I think that 3 digit number question is really relevant. When I get my son on Amazon and I give him my card details he says he doesn't need it because it's already set up. Well that is a bit of a worry because we have given it at one time and we don't know they've saved them. - Glasgow

Some suggested that it would be helpful if individual members of the public could find out more about where their data reside,

I don't know who to approach, this is the big thing for me, we don't know anything about it…the last time I was here this came up and I don't know who to contact. […] I'm just thinking as a member of the general public, where do I start? It's about ownership and I just don't know who, it's a big question mark. - London

In Glasgow someone came up with the following idea for private sector companies holding data and potentially sharing it with the Data Centres,

It would be good to own your own data and opt in or opt out [to third parties using it], like get a text message saying this company wants to use your data for this research, we're going to use it for this research or something. - Glasgow

This chimed with the views of some of the participants in Colchester who said,

We all agreed that your information should be yours to give and that you shouldn't have to say no. To not give the information you shouldn't have to turn around and say I don't want to give it, you should turn around and say actually I do want to give it. A lot of the assumption at the minute is that they'll take it unless you say no whereas it should be the other way around. - Colchester

We'd like it to be opt in or opt out for our ownership [so that] we were in control again of the limits and the usage of our data. - London

Participants said that more information is required about the transfer of data ownership,

What happens after the first owner passes data on, we want more detailed information. What are our options? – London

As a result they called for improved communications about what data are owned by the Data Centres.

5. Views on public engagement and communication

Summary

The dialogue on the use and re-use of private sector data for social research demonstrated that the public is generally unaware of the concept of big data and what social research is. The Data Centres were formed in 2014 as a new initiative within the ESRC's investment in big data. As such participants were not aware of what the Data Centres are and what their future role in society is. There was a sense that raising awareness of data collection processes in general is very important as many people do not realise they share data many times a day. Raising awareness of the work of the Data Centres is equally important to ensure people understand and acknowledge the value of this data for the social sciences and society.

Recommendations for improved engagement with the public include:

- Emphasise how individuals benefit from the use of private sector data for social research
- Improve communication about Data Centre processes and safeguards
- Share research objectives and outcomes
- Instigate two-way communication when using personally-identifiable data
- Use a wide range of channels to deliver the message
- Use plain, jargon-free English.

In addition participants were keen to see education programmes for children and their parents on big data and the work of the Data Centres. Whilst it is understood that this is not in the remit of the Data Centres it is important to include it in the recommendations for broader engagement with the public on these issues.

The dialogue on the use and re-use of private sector data for research demonstrated that the public is generally unaware of the concept of big data, what social research is and what the Data Centres do,

Before we came here, we had absolutely no idea what the Data Centre was so if you were asking people to comment on it people wouldn't know what research was going on. – Glasgow

5.1 Increase awareness of social research and the role of the Data Centres

There was a sense that raising awareness of the role of data in society and social science in general is very important,

At the end of the day, all those people here in Colchester running around living their stressful lives. How many people do you think are thinking about data protection? I would say zero. We're talking about it because we're here, no one out there's thinking about data protection, they just go out, flash their card. – Colchester

None of us knew [about big data and how data are being used]. We were all sat here going 'When did this happen? When did that happen?' Why are they not saying that? Why is that not clear to everyone who signs up for it? - Glasgow

Raising awareness of the work of the Data Centres is equally important. As a participant in Glasgow said,

Making the Centres more publicly visible to me is quite a big thing. - Glasgow

We felt that the government and potentially ESRC and the CDRC could potentially be doing more to make the public aware of their work and highlighting the benefits of social research and science. We thought that would be a positive step forward to engage with the public. - London

Although some argued that the public is entitled to know more,

It's the government that's basically financing it, isn't it? And it's quite a few million pounds a year, so the public are entitled to know what that money is being spent on. – London

Not everyone agreed that this is a role for the government,

I think it's partly CDRC's responsibility. I mean, the reality of Government is you have about two civil servants who cover a portfolio of multiple research councils and who knows what else. - London

5.2 Ideas for improved engagement with the public

5.2.1 Communications about Data Centre processes

Another way of achieving increased public support for the use of private sector companies sharing data for social research purposes would be improved communications about the data management processes and the data sets being used. This was seen as a significant opportunity for the Data Centres across the three dialogue locations,

Obviously we think it's alright [the processes] but we think they [the Data Centres] can go further with it. We were saying: no more grey areas. We need to know what they're doing. Prove to us it's right, it sounds good but we need to understand it. – *Colchester*

Some groups discussed how a resistance to data sharing stems from a lack of understanding of the data journey and concerns about security of data,

A lot of the stigma that comes with data sharing comes with people not knowing and not being educated about the facts of how the data's being used. – Colchester

Just educate the public about the Data Centres. If the public are aware of what's happening then they may not mind so much. - Glasgow

Particular mention was made of the need to communicate widely about the three access levels at the Data Centres (Open Data, Safeguarded Data and Controlled Data) and how security measures differ for each type of data.

5.2.2 Demonstrate how individuals benefit from the use of private sector data for social research

Although through the dialogue there was a growing awareness that most data are anonymised before they reach the Data Centres, some participants said they would like to understand how they as individuals benefit from the research conducted at the Data Centres. They wanted to see how using their data can benefit social science and therefore public policy. This quotation typifies the views of many,

Show the greater good of using my data – the benefits of my data for the greater good. - London

5.2.3 Share research objectives and outcomes

All participants agreed that it is essential that the Data Centres share research objectives and outcomes,

One opportunity for the Data Centres is to tell the public what research is happening and what they are doing with it. – Colchester

Could you not when you've conducted your research, tell the people what you've found? - Glasgow

5.2.4 Instigate two-way communication when using personal data

In Glasgow one of the small groups discussed that it would be useful if there was a two-way communication process between the Data Centres and the public whose data are used in social research. The group said that the Data Centres should communicate the results of research projects and how it benefits society and well as individuals,

Just so you know what's been held on you. You have the right to know. – Glasgow

Ongoing communication between us and the Data Centres – we'd like to keep an eye on our own data - London

This was a common feeling across the locations. Several participants indicated that they would appreciate feedback on how the use of their data benefits society. When challenged to consider a future scenario of a

Data Centre using personal health data to contribute to a more sustainable health service (Technical Appendix p. 100), a participant in Glasgow said,

I'd be really willing to sign up for this only if I saw the benefits that my data provided. […] I want the Data Centres […] to give something back to me. If you see the impact that it has not only on your life but on the life of the NHS as well and then they are going to change their services, that's the greater good of it. - Glasgow

If personal data are used for social research participants in Glasgow expressed the wish to be able to engage on a one-to-one basis with the Data Centres,

I was thinking you could ask the Data Centre information if you wanted to, you could ask questions and you could get information back from them. - Glasgow

5.2.5 Educate children and parents

Across the three locations participants said that improved engagement with the public about big data and the work of the Data Centres starts with reaching out to primary and secondary school children and their parents. As one participant in London said,

I've been thinking a lot since the last session about how kids who are growing up with technology and it's not even weird to them at all. They're going to grow up and sharing their data is going to be the norm. There should be a lot of education on data and going into schools and stuff. - London

Some participants shared stories of their children's learning about personal data and online platforms requiring data. They flagged up that parents need to learn about data as well,

It is part of what they do in school. […]They are made aware of personal data and they talk about Facebook and sharing their information and social media. He knows more about privacy settings on Facebook than I do. […] Why can't they do something for the parents? - Colchester

Although some said that information will cascade from children to parents,

This puts a huge demand on resources […], but if the police can find a way of doing it then I'm sure they [the Data Centres] can. Go into schools and start talking to pupils because that will then disseminate to the parents who will get all interested in what's going on. - Colchester

In Glasgow some felt that it should be compulsory for schools to teach children about data,

If we had legislation to say that (the role of data in society] was introduced to the school programme then more people would come to know about it just as we have become more conscious of it [over] the last couple of session. – Glasgow

5.2.6 Use a wide range of channels to deliver the message

A quick-fire brainstorm at the final session led, in Colchester, to a list of potential channels for the delivery of Data Centre messages ranging from rap songs for young people,

Rap songs tend to help with things. They tend to do it for everything else so perhaps [it might work for the Data Centres]. - Colchester;

to a newsletter for the general public,

Maybe people could subscribe to a newsletter from the Data Centre where you can get information from them in terms of what they're doing. They could even share something like an interesting find over the last period. - Colchester;

Others felt it would be useful to have one portal for everything to do with data,

A simple and easy website, something like www.data.com. - Colchester

or one website for the three Data Centres,

What about a website for the Data Centres to put the information on. Advertise the website on social media so people aren't scared. – Colchester

The website should comprise an overview of past and current research projects.

One participant suggested that the Data Centres start the information giving process close to home, for example with an open day about the work of the Business and Local Government Research Centre at Wivenhoe House at the University of Essex,

I wonder how many university students are actually familiar with what is going on at the Data Centre that is actually operating in the place they are studying at. - Colchester

Participants welcomed the ESRC video shown in the first round of dialogues as a resource about big data. Suggestions were made to use this video as part of a wider media campaign,

I know it'd be quite expensive, but I think that they could possibly produce a 30-second advertisement to go on the television, to just very briefly explain what they are and what they do. - Colchester

5.2.7 Use of accessible language

Throughout the dialogue reference was made to the importance of using plain, jargon-free English to engage people with big data and the work of the Data Centres. In all locations dialogue participants acknowledged that they hardly ever read Terms and conditions or Privacy Statements when providing data. One of the groups in Colchester said in the final plenary session that they are fully aware that they have the option to read them but that the language is too complicated. They said,

It needs to be made easier. There needs to be a help section. – Colchester

And someone else said,

They could make it much simpler and have it in plain English. Most of it is not trying to help you, most of it is just about trying to cover their backsides. If it was made simpler it would work better. – Colchester

A participant in London illustrated the need for simplicity with an anecdote,

There was a thing in Denmark recently, they made this app and part of the terms and conditions were that you promised to give them your children and everyone just signed away their children! - London

Others in London commented on the length of the agreement documents and the issue of burying important issues in small print,

There is an issue with the length of terms and conditions, you're not going to read them all. – London

I think the small print should be turned into big print. – London

One of the groups in Colchester discussed how a lack of uniformity in terms and conditions causes confusion, for example about giving consent to data sharing,

A lot of that stuff […] is in the small print and not everybody reads the small print so sometimes you don't tick it when you should do if you don't want to share and vice versa. – Colchester

6. Conclusion

The dialogue demonstrated that there is wide public support for the use and re-use of private sector data for social research. Participants said that the benefits of using private sector data outweigh the risks for this specific purpose. The public was clear that drawing from information on safeguards and processes in place, they could put their trust in the Data Centres more than they could in the regulated and/ or commercial organisations. As participants in Colchester said,

Most of the problems and the things people are worried about don't come from places like the Data Centres, they come from the private sector and I think the Data Centres have got it right with all their safeguards, they don't make mistakes. - Colchester

I think that Data Centres should be the authority figure within the usage of data, so it's their right to take the data and check it over, even if it's controlled data. [...] They should be able to look at it and use it themselves and check that it's being used appropriately. They don't have to pass it on. They're not using it for profit so they're not going to be competing with a company. - Colchester

The principal concerns about the private sector stem from the sheer volume of data collected with and without consent from individuals and the profits being made from linking data and selling data sets. As a consequence the public expect that the Data Centres will have very strict processes in place to check the quality and accuracy of data acquired from commercial organisations.

The elements of the information governance processes at the Data Centres that participants in the dialogue found particularly reassuring include the project approval process; the generally high level access procedures for researchers; the fact that there are penalties in place for social researchers who misuse data; and that researchers are using data for public benefit. Our findings have shown that the latter point is the over-riding factor in providing reassurance to participants on the use and re-use of private sector data for social research.

However, if the Data Centres aim to increase levels of public trust, through excellent Plain English communications, it is important that concerns around data security and the privacy of individuals are addressed. As the dialogue progressed it became clear that access to information about the Data Centre processes alleviated many of the concerns people had initially. An increased appreciation of the benefits of social research meant that a trade-off took place between concerns and perceived risks of the use of private sector data in favour of research that leads to improvements in public policy and services.

It is therefore clear that communication and education about the processes by which the Data Centres acquire, store, own, access private sector data, and allow access to the data they have, is vitally important in establishing credibility with the public for the newly established Data Centres. It will be important for the Data Centres to demonstrate, where relevant including case studies, how the use of private sector data in social research can lead to policy or service improvements.

In designing, facilitating and reporting on the dialogue HVM has found that the public find the issue of the use and re-use of private sector data for social research complex, but not impenetrable. A clear communications and public engagement framework for working with the public would be extremely valuable in addressing concerns. Participants, once introduced to the concept demonstrated a clear interest in the subject of data use and re-use and as a result wished to find out more about how it contributes to public benefit. A communications and public engagement framework would nurture this interest and provide clear and accessible information on Data Centre processes.

It could include:

- Clarity that by default data would be used where no disclosure risk was posed and that, where avoidable, personal data would not be used, in isolation or via linkage with other data
- The safeguarding steps taken when the research necessitates the use of personal or sensitive personal data

- Information on data ownership, an area which raised many questions for participants
- Confirmation in Centre communication that when data are fully anonymised or de-identified, they are not (necessarily) personal.

The dialogue findings clearly demonstrate that the more information people are given about Data Centre processes and the benefits of using private sector data for social research, the more likely it is that the public will support and be very much interested in their work.

Acknowledgements

Hopkins Van Mil is very grateful to the members of the public who took part in the dialogue for the way they embraced what for many was a new process. The willingness of participants to discuss complex information and deliberate on issues they had perhaps not considered before enabled the facilitation team to gain a clear understanding of the main issues and concerns regarding the use and re-use of private sector data for social research purposes at the Data Centres.

The ESRC and the Data Centres have demonstrated an equally great commitment by developing presentations, supporting the preparation of contextual information and providing feedback on the process in a timely and constructive manner. It has been a pleasure working with Maria Sigala and Paul Meller from the ESRC, who played an important role in keeping the project on time and to a high standard, and the Steering Committee comprising a range of experts who contributed to the development of the dialogue materials.

Hopkins Van Mil: Creating Connections Ltd
October 2015

Dialogue findings prepared by:
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October 2015

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