

Observing data-driven approaches to Covid-19: Reflections from a distributed, remote, interdisciplinary research project

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1. Introduction

The Observatory for Monitoring Data-Driven Approaches to Covid-19 (OMDDAC) is an Arts and Humanities Research Council (AHRC) funded research project investigating data-driven approaches to Covid-19, focused upon legal, ethical, policy and operational challenges. The project is funded for 12 months from November 2020 and incorporates six main work packages with outputs including landscape mapping, snapshot reports based around key case-studies, practitioner guidelines and a final report and project conference. Key methodologies include interview-based research and a public perception survey. Case-studies and issues explored to date by the project include so-called vaccine passports, new methods of data analysis and data sharing developed during the pandemic, and the use of health data by the police. As OMDDAC is funded under the AHRC's Covid-19 rapid response call, the emphasis from the funder has been on achieving immediate impact with outputs and communications (via the project website, Twitter feed and online events) aimed primarily at a non-academic audience, an emphasis that risks being somewhat at odds with the priority given in high education institutions to peer-reviewed publications in academic journals. Due to the constraints of the pandemic, the project has been carried out in a fully distributed and remote manner, with some team members never having met in person. The subject of the research is continually changing and developing, creating unique project management issues, with the impact of the pandemic pervasive in the lives of the researchers.

The project is a collaboration between Northumbria University (Law School, Department of Computing and Information Sciences, Department of Mathematics) and the Royal United Services Institute, a defence and security think-tank, involving researchers with expertise in technology law, data protection law, medical law, practical ethics, computer science, data

science, applied statistics in health, technology studies and behavioural science, and aims to carry out interdisciplinary research. The definitions of ‘multi-’, ‘inter-’, ‘trans-’ and ‘cross-disciplinarity’ are difficult to pin down, as is the degree of synthesis required for interdisciplinarity.¹ However, it is certainly the case that interdisciplinarity exists on a continuum ‘ranging from informal exchange to the complete integration of concepts, methodology...’² The OMDDAC project has engaged in interdisciplinary research along that continuum, including interdisciplinary research within the legal field itself,³ research involving the legal discipline as auxiliary discipline contributing input to the computer science and statistics-led survey, and ‘transdisciplinarity’⁴ or integrated research⁵ where researchers from disciplines work closely together (and with external stakeholders) to address ‘real world’ problems.

At the time of writing, the project has reached its half-way stage, during a period when lockdown restrictions in England are cautiously being relaxed, yet with the project likely to remain mainly virtual for the remainder of its term. Furthermore, the pandemic has necessitated new ways of remote working, many of which will remain in place – and will be the norm – in the future. If an increasingly remote and distributed research environment is to be successful, the benefits, risks and challenges that we have identified must be acknowledged and addressed. This article therefore provides a reference point for funding bodies, universities and research teams for future research policy and the development of practical guidance and training programmes.

This article takes the form of a series of reflections from the points of view and voices of individual project researchers – the specialist legal researcher, the think-tank Co-Investigator,

*Northumbria University, ** Royal United Services Institute. We would like to thank the anonymous reviewers for their helpful comments and suggestions. Further details about the OMDDAC project can be found at <https://www.omddac.org.uk/>. Authors’ names alphabetically.

¹ Mathias M. Siems, ‘The Taxonomy of Interdisciplinary Legal Research: Finding The Way Out of The Desert’ (2009) *Journal of Commonwealth Law and Legal Education* 7(1), 5-17, 6.

² Ton Wilthagen, Emile Aarts, & Peggy Valcke (2018) ‘Time for interdisciplinarity: An essay on the added value of collaboration for science, university, and society’ Tilburg University, 12.

³ n2.

⁴ Basarab Nicolescu, ‘Methodology of Transdisciplinarity’ (2014) 70 (3-4) *World Futures* 186, 187; Sue LT McGregor, ‘Transdisciplinarity and Conceptual Change’ (2014) 70 (3-4) *World Futures* 200, 201; Julian Webb, ‘When ‘Law and Sociology’ is not Enough: Transdisciplinarity and the Problem of Complexity’ in Michael Freeman (ed), *Law and Sociology* (Oxford Scholarship Online, 2006) 91.

⁵ Sanne Taekema and Wibren van der Burg, ‘Introduction: The Incorporation Problem in Interdisciplinary Legal Research’ (2015) *Erasmus Law Review* 2, 55-64.

the post-doctoral researcher, statistical and data science researchers, and the Principal Investigator – and organised under two main themes - project management and internal communication; and methodologies/interdisciplinary research. We thus draw out lessons for future remote and distributed research, and for interdisciplinarity more generally. Under the project management and internal communication theme, the principal investigator provides her thoughts on the management challenges created by OMDDAC’s remote and distributed interdisciplinary research structure, followed by a think-tank’s perspective, as the co-investigator, on the project’s communication challenges. OMDDAC’s legal research associate provides her perspectives on the challenges of building a profile and working relationships via remote methods. The methodology and interdisciplinarity section includes reflections by one of OMDDAC’s specialist legal researchers on the lessons learned from the project’s remote interview method. Our penultimate section discusses the ongoing development of a public perceptions survey within a remote interdisciplinary project from the perspective of the researchers in data science and statistics. Our conclusions focus upon interdisciplinarity, the benefits and challenges of remote research methodologies, and issues of collegiality. Interdisciplinarity is often held up as an end in itself. However, the OMDDAC experience demonstrates that the theoretical benefits for research will only be realised by designing the integration – in terms of responsibilities and involvement of each discipline and the degree of interdisciplinarity expected - into every aspect of a project. It cannot be assumed that integration will somehow happen without effort, including new university processes to support interdisciplinary researchers and cut through departmental and disciplinary barriers. Finally, we warn that it will be a false economy for universities and funders to assume that research projects can continue to be conducted in a mainly remote manner and therefore, that budgetary savings can be made by reducing time allocations, travel and academic networking.

2. Challenges and solutions relating to project management and communication

The PI in a pandemic (Marion Oswald, Northumbria University)

According to the Arts and Humanities Research Council guidance, a principal investigator (PI) ‘takes responsibility for the intellectual leadership of the research project and for the overall

management of the research or other activities.’⁶ In this simple statement lies a role which has to be all things to all people – both a bureaucrat and innovator, the equivalent of a director of a start-up but within existing internal and external bureaucracies that come with considerable reporting and administrative requirements. The PI is expected to be a project manager responsible for delivery of the research in accordance with the project plan and agreed milestones. The PI must achieve impact for the research, including the identification of beneficiaries, maintenance of networks beyond their immediate research community, and wide publication and exploitation. In addition, the PI must be a professional manager of data and collaborations, while ensuring ‘that research staff and students develop research, vocational and entrepreneurial skills that are matched to the demands of their future career paths.’⁷ Fulfilling the role of PI successfully is a tall order at the best of times. For a PI of a Covid-19 rapid response project such as OMDDAC, there are additional challenges directly related to the pandemic emergency and the remote nature of the interdisciplinary research.

The emphasis on impact

Research council funders understandably require projects to produce immediate impact in addressing issues raised by the pandemic. Yet society remains in a state of considerable flux and uncertainty; the subject of the project is continually changing and developing,⁸ creating unique project management issues, as legal, ethical, policy and operational consequences of data-driven approaches to Covid-19 take time to emerge and crystallise. There are strong personal and political opinions to disentangle. We continue to operate in a crowded market of data, policy and opinions, thus increasing the challenge of producing research with impact – in other words, our ability to create impact is affected by the very issue that the project is researching!

As a relatively small project compared to other Covid-related projects and consortia within academia, we have adopted a number of strategies in an attempt to deal with this ‘policy noise’. Our interview and survey methodologies and project outputs were designed from the outset to inform the development of policy and identify key issues faced by the practitioner.

⁶ Arts and Humanities Research Council, *Research Funding Guide* Version 5.3, February 2021, 46.

⁷ *Ibid*, 98.

⁸ An example being the ongoing debate over the potential benefits and risks of vaccine passports as discussed in the OMDDAC snapshot reports <https://www.omddac.org.uk/news/snapshot-reports/>.

Our ‘snapshot’ reports, for example, highlighted case-studies within pandemic policy response, health and policing, explaining how the data analysis worked, the risks and benefits, and legal and ethical issues, with lessons learned laid out in a user-friendly format. We have therefore been able to respond in an agile way to Parliamentary and Governmental inquiries into aspects of the pandemic relevant to data-driven approaches, and to involve practitioners in disseminating the findings via online live events. A variety of communication methods – website, Twitter and JiscMail – have been used to disseminate project findings and make connections. Furthermore, the relationship with our supporter organisations, including the Centre for Data Ethics and Innovation and the Ada Lovelace Institute, has been fundamental in enabling the project to make connections with key stakeholders and to help amplify and disseminate the project findings outside of academia.

The challenges of remote, distributed interdisciplinary research during a pandemic

OMDDAC researchers are arguably conducting an extreme form of action research.⁹ Although we are not the ‘actors’ in such research in terms of implementing the data-driven approaches under examination, we experience the consequences of those approaches to a greater or lesser extent. The pandemic has affected everyone, whether due to health concerns, lockdown restrictions, working environments or adaptations to research methods as discussed below. The subject of the research is all pervasive in the lives of the researchers. Furthermore, staff ‘burnout’ in academia during the pandemic has been experienced by many¹⁰ with the output of female academics disproportionately affected due to school closures, family/home responsibilities and competing academic and administrative duties.¹¹ For a project reliant on qualitative research and interdisciplinary team-work, the recognised phenomenon of ‘Zoom fatigue’¹² presents a considerable risk. Furthermore, the PI’s role is commonly undertaken without line management responsibility for the majority of Co-Is, nor control over their overall workload, a challenge that increases in significance when set against the above pressures.

⁹ O’Leary’s cycles of action research: O’Leary, Z. (2004). *The Essential Guide to Doing Research*. London: Sage.

¹⁰ Virginia Gewin ‘Pandemic burnout is rampant in academia’ *Nature*, 15 March 2021 <https://www.nature.com/articles/d41586-021-00663-2>.

¹¹ Brooke Peterson Gabster et al., ‘Challenges for the female academic during the Covid19 pandemic’ *The Lancet*, 18 June 2020 [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)31412-4/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31412-4/fulltext).

¹² Bailenson, J. N. (2021). Nonverbal Overload: A Theoretical Argument for the Causes of Zoom Fatigue. *Technology, Mind, and Behavior*, 2(1). <https://doi.org/10.1037/tmb0000030>.

Delivery of OMDDAC's interdisciplinary research is completely dependent upon our ability to collaborate. Each team member has a crucial role to play in achieving project milestones as set out in the strategic plan and in respect of dissemination and impact. Nair et al. found that '[i]nvolving all researchers in most aspects of the study was seen as a way to keep team members engaged and participating.'¹³ OMDDAC's research processes – including project interviews and the public perception survey– have been designed to involve all researchers, with project publications being written jointly, a lead author coordinating the input of other researchers according to their discipline and specialist knowledge. As Bessant discusses below, the interdisciplinary 'pair' online interviewing method developed by OMDDAC has enabled considerable insight to be gained in a relatively short space of time. Furthermore, successful interdisciplinary collaboration is dependent upon building up understanding between disciplines, in order to avoid talking at cross-purposes, where words and concepts have different meanings for different disciplines. This highlights the need to build relationships, trust and understanding between team members by 'both task talk and relational talk.'¹⁴ However, the OMDDAC project has to date operated using remote methods of communication and home working, with some team members never having met in person. We are a distributed project in terms of organisation, disciplines involved and working location. It was recognised from the start of the project that 'forming a team is not the same as being productive,'¹⁵ although we cannot rely on chance 'water-cooler' moments or regular face-to-face meetings to build cohesive relationships. Cummings and Kiesler argue that

'[d]istributed work tends to disrupt both coordination and relationships...If, on top of distance, the team is made up of people from different universities and disciplines, then team members are likely to feel closer to colleagues in their own department and not as close to those at other universities. They usually belong to local projects

¹³ Nair, K.M., Dolovich, L., Brazil, K. *et al.* It's all about relationships: A qualitative study of health researchers' perspectives of conducting interdisciplinary health research. *BMC Health Serv Res* **8**, 110 (2008). <https://doi.org/10.1186/1472-6963-8-110>.

¹⁴ Jessica Leigh Thompson (2009) Building Collective Communication Competence in Interdisciplinary Research Teams, *Journal of Applied Communication Research*, 37:3, 278-297, DOI: [10.1080/00909880903025911](https://doi.org/10.1080/00909880903025911)

¹⁵ Jonathon N. Cummings and Sara Kiesler 'Who collaborates successfully?: prior experience reduces collaboration barriers in distributed interdisciplinary research' *CSCW '08: Proceedings of the 2008 ACM conference on Computer supported cooperative work* November 2008 Pages 437–446 <https://doi.org/10.1145/1460563.1460633>.

(plus teaching and other local obligations) that exert a pull on their time and attention.’¹⁶

All project researchers are members of the virtual team and can participate in the online ‘posts’ and in the virtual team meetings. The project has made use of the online platform to build up a virtual library of relevant literature, media articles and other sources, contacts and events that team members can easily share with others and as one way of managing the pandemic information overload. Of course, creating yet another virtual platform for project communications risks exacerbating such information overload unless team communications are used in moderation.

The same online platform is used for regular team meetings, although discussion in such meetings has been action focused, and it remains the case that those with existing relationships or disciplines in common tend to work more closely together. Nair et al. emphasise the importance of relationship building:

‘Time to build relationships was seen as both a necessity but also as a frustration as sometimes the short time frame of grants did not allow for this development. Time was needed to learn about the perspective of others, assess the value of what they are contributing, and finally, to assimilate this new knowledge into one's own knowledge base.’¹⁷

Online tools can be highly effective for task orientated activities, but much less so for relationship building or for creating understanding between team members from different disciplines in terms of their contributions to jointly written documents for instance. In ‘normal’ circumstances, it might be assumed that such relationships would build naturally. The PI of an interdisciplinary project in a pandemic can make no such assumption however, and must give specific thought to building a culture of collegiality using the remote methods available, to ensure that the ‘affective tension’ inevitable in interdisciplinary research will work positively to increase understanding between disciplines.¹⁸

¹⁶ Ibid.

¹⁷ n13.

¹⁸ Line Hillersdal et al., (2020) ‘Affect and Effect in Interdisciplinary Research Collaboration’ *Science & Technology Studies* 33(2) 66-82.

3. A think-tank's perspective on project management and communication challenges during the pandemic (Keith Ditcham, Ardi Janjeva, Royal United Services Institute)

One main challenge to interdisciplinary working caused by the pandemic has been communication. The inability to get interested parties, the research team, and project partners in the same physical space required a rethink on how to communicate effectively. Fortunately, members of the RUSI team had experience working within various international consortia on other projects where these challenges were commonplace, allowing for a swifter adaptation. Having a PI with a clear focus, and in this case, who has close ties to both parts of the research consortium, was essential in laying the foundations for this rethink. Regular team meetings where updates are shared, progress reviewed and ideas discussed have been the main form of whole-group communication, with further sub-groups meeting on an ad-hoc basis to deliberate on research matters. That being said, care had to be taken to ensure that these sub-groups did not evolve into siloes that became too distinct from one another. From RUSI's perspective, the preparatory measures taken at the beginning of the project, and the consistent effort put in by all team members to reach out across institutional boundaries ensured that pandemic restrictions did not have a detrimental impact on the quality of outputs. There remains the possibility that the lack of informal interaction amongst the research team meant that we missed out on a range of new ideas. Measuring this counterfactual, however, is near impossible, and judging by the constant stream of new ideas being circulated across team members during the project regardless, the effect is likely to be minimal in any case.

There were certain parts of the project where the interdisciplinary makeup of the research team was especially impactful. The main example of this can be seen with the Snapshot Reports. These Reports analysed three case studies in the sectors of data-driven public policy, technology and public health and policing and public safety. This approach enabled an easier identification of common themes in the pandemic response across key sectors, such as the need for greater transparency in publishing data and rationale behind decisions, data quality and interoperability issues between systems, and the importance of ongoing user-centric monitoring and evaluation of data-driven tools. From the beginning, a clear framework was established defining sub-sections in a way that made the most of the technical, legal, and

subject matter expertise in the team (for example, operational functioning of the case study; statistical validity; benefits and risks; and legal and governance frameworks). The remote working environment is unlikely to have had any meaningful impact on this – with one team based in London and the other in Northumbria, the report writing process would largely have been conducted in the same manner irrespective of the pandemic. Where subject matter expertise in the team overlapped, it could be said that at times it was difficult to know exactly who to go to when seeking an answer to a question, for example. This may, if subconsciously, have been exacerbated by the pandemic and the inability to meet colleagues in person, thereby having a more natural feel of people’s respective skills and specialisms. To the extent that this was the case, it is very likely to have had only a minimal impact, however.

4. Starting a ‘virtual’ postdoc during a pandemic: an early-career perspective (Rachel Allsopp, Northumbria University)

Joining a new project team as an early career researcher is always a daunting prospect. Doing this virtually, and during a pandemic, however, presents its own unique challenges. It also presents several unique opportunities. This section is a reflection on the first four months as part of the OMDDAC team, with a particular focus on the unique challenges and opportunities that have presented themselves so far during this virtual research project.

As an early career researcher in the field of law and technology, joining a pre-existing research project alongside a team of experienced academics and researchers, I have been eager from the outset to create a positive impression of myself, as a capable, diligent and professional member of the team. How to achieve this in a remote setting, however, raises considerations additional to those that ordinarily arise in a non-remote working environment. In joining a research project during the Covid-19 pandemic - *about* the Covid-19 pandemic - it was almost inevitable that the role would be primarily remote-based, meaning that introductions and team meetings have all taken place virtually, from the box room of my house (or, on occasion, the dining room table). Correspondingly, one perhaps trivial, but particularly illustrative, example of this broader challenge has been the selection of an appropriate video-conferencing background. Would it be acceptable for the flowery bedspread and collection of ‘Pop Funko Vinyl’ figures to remain on show behind me? Would a blurred background be more appropriate? Or perhaps a stock image of a bookcase and plant would leave a better impression. In making this seemingly trivial decision, I found myself in conflict between the

desire to cultivate working relationships with new colleagues by sharing elements of my personality (a task which is inevitably more of a challenge when working remotely, as Oswald observes above) on the one hand, and the need to present myself as a serious, professional researcher on the other.

This was compounded further when conducting remote interviews in the form discussed by Bessant below. The interviews we conducted could be considered 'elite' or 'expert' interviews in a broad sense,¹⁹ in that they involved speaking to a wide range of professional stakeholders across multiple sectors, each with a detailed expertise of the key data-driven responses to Covid-19. As such, I was conscious of the need to convey the utmost professionalism in conducting the interviews, being keen to ensure a positive impression not only of myself as a researcher, but also on behalf of OMDDAC. In this regard, 'doing my homework'²⁰ in advance of the interview was of course key, as with conducting any 'elite' interview in a non-remote setting, in order to project that positive impression. Again, however, the virtual setting in which our interviews were conducted presented unique challenges. In addition to the 'background' considerations outlined above, there was the additional concern of navigating the video-conferencing technology to ensure that it was operating correctly. To present as a professional researcher, it seemed imperative that I try to ensure the technology was fully cooperative in order to make the process as seamless as possible for the interviewee – and not least avoid the dreaded 'you're on mute' feedback.

Relatedly, I had to consider how I was presenting myself - in terms of verbal and non-verbal cues - to the participant via the medium of video-conferencing. There is an inevitable cost in building a rapport with the interviewee virtually, as compared with conducting interviews in-person. Unlike during face-to-face interactions, however, video conferencing facilities provide you with real-time, visual feedback on how you are presenting yourself (provided your camera is switched on). Accordingly, while conducting the interviews, my focus was almost divided between trying to engage with the participant and build that necessary rapport, and at the same time – but without detracting from the interview itself - being hyper-aware of, evaluating and, where necessary, adjusting my own presentation throughout. Indeed, to

¹⁹ Beate Littig, 'Interviewing the Elite — Interviewing Experts: Is There a Difference?' in Alexander Bogner, Beate Littig and Wolfgang Menz (eds) *Interviewing Experts* (Palgrave Macmillan, 2009) 98-113, https://doi.org/10.1057/9780230244276_5.

²⁰ William S Harvey, 'Strategies for Conducting Elite Interviews' (2011) 11(4) *Qualitative Research* 431, 434.

some extent this applies to all forms of video communication, with interviewees and team-members alike, and perhaps assists in explaining the phenomenon of 'Zoom fatigue' mentioned by Oswald. In this medium of remote video-conferencing we, at once, find ourselves receiving, evaluating and (consciously or subconsciously) responding to visual feedback on our own presentation while maintaining a conversation or participating in a meeting, often involving multiple participants. Moreover, as discussed throughout this paper, in this virtual setting we generally have to work harder to pick up on non-verbal cues and build that necessary rapport than we would have to when communicating in person. Combined with the widely experienced blurring of boundaries between work and home-life, as remote working has become the norm for many during the pandemic, on reflection it has perhaps never been more important to take the time to disconnect from all of the screens that pervade our daily lives.²¹

5. Challenges and solutions relating to methodologies and interdisciplinary research

Stakeholder Mapping Interviews (Claire Bessant, Northumbria University)

The OMDDAC project, as noted by Oswald, sought to bring together researchers across a variety of disciplines, including law. Whilst traditionally legal research has perhaps been understood as the doctrinal study of law, which assumes an exclusive focus on traditional legal materials and their interpretation, some scholars suggest that socio-legal approaches to legal study are increasingly becoming accepted, whilst pure doctrinal study of the law has somewhat fallen out of favour.²² The OMDDAC project in fact incorporates both doctrinal research and empirical legal research.

Empirical legal research, a subset of the wider genre of socio-legal research, is defined here as 'the study of law, legal processes and legal phenomena using social research methods, such as interviews, observations or questionnaires.'²³ In order to effectively conduct empirical legal research, the legal researcher must, of course, have a detailed understanding of the literature on empirical methods and theory. Indeed, the empirical legal scholar will be

²¹ Gewin (n 10).

²² Fiona Cownie and Antony Bradney 'Socio-Legal Studies: A Challenge to the Doctrinal Approach' in Dawn Watkins and Mandy Burton (eds), *Research Methods in Law* (Routledge 2013) 34.

²³ Mandy Burton, Doing Empirical Research in Mandy Burton and Dawn Watkins (eds) *Research Methods in Law* (Routledge 2013) 55.

directed to and is likely to refer to much the same literature as any other scholar using empirical research methods, whatever their discipline.

As Oswald mentions above, the OMDDAC project aims at integrated research with methodology particularly focused in the first stages of the project on interviews to obtain qualitative data. Within the OMDDAC project plan, work package 1 (WP1) used interviews to identify which data driven projects had been or were being developed to respond to Covid-19 in the UK, in order to develop a short list of case studies for more detailed exploration in work package 2 (WP2, the production of 'snapshot' reports).

Many of the OMDDAC team already had experience of using empirical methods, particularly interviews. It was identified at the project outset, however, that different interview approaches had been used by different members, and some individuals had limited experience of interviewing. Accordingly, before WP1 commenced, and before any interviews took place, the team discussed the most appropriate interview method to be used and developed a supportive strategy to ensure all team members were comfortable with conducting the interviews.

WP1 commenced with the project team collaborating together, adopting a purposive, selective sampling strategy to determine potential stakeholders to interview about the use of data-driven approaches across the UK. Semi-structured online interviews were then conducted with thirty-four stakeholders drawn from: the private sector; government; academia; police and law enforcement; organisations specialising in the use, management and protection of data; the medical profession; charities; regulators and the legal profession.

An interview can be understood as a conversation between a researcher (the interviewer) and an interviewee that takes place at a pre-arranged meeting; the interviewer asks questions and the interviewee provide answers, telling the interviewer about experiences or topics of which they have first-hand knowledge or into which they have insight. (In this project interviews were in fact conducted by interviewer pairs, and whilst most interviewees were interviewed individually, a small number were interviewed in pairs, for example, where two colleagues expressed interest in participating in the research. In such cases the same

questions were used as for single interviewees, with both interviewees being encouraged to provide full answers to each question.)

Brinkman suggests interviews are one of the most common ways of producing knowledge in the human and social sciences.²⁴ Certainly, interviews have much to offer the qualitative researcher, whatever their discipline of origin, enabling researchers to achieve an in-depth understanding of participants' perspectives and experiences, thus enabling the researcher to explore complex issues in a way not possible by observation or survey.²⁵ By encouraging interviewees to speak in their own voices, researchers gain understanding of the research topic from the perspective of someone who has insight into that topic.²⁶ Where interviewees are allowed to talk at length, researchers obtain rich data through full, detailed narratives,²⁷ which provide 'solid material for building a significant analysis.'²⁸ Interviews are, however, not without criticism. Some scholars suggest that given the artificiality of interviews, and the fact interviewees are expected to create answers under time pressure, interviewees cannot be expected to truthfully divulge potentially sensitive information.²⁹ Some scholars express doubts about whether interviewees are ever able 'to get inside someone's head', suggesting that all that is achieved is a 'representation of an individual's views and opinions,'³⁰ with a 'tenuous basis' in reality.³¹ Svend suggests that interviews nonetheless 'often represent the most adequate means of knowledge production.'³² In this instance it was considered the benefits of interviews undoubtedly outweighed the negatives.

This twelve-month project responds to an international pandemic. With WP1 serving as a foundation for future work packages, the timescales for conducting WP1 were short. Ethical

²⁴ Svend Brinkmann 'The Interview' pgs 576-599 in Norman K Denzin and Yvonna S Lincoln 'The Sage Handbook of Qualitative Research' (5th Edition, 2018, Sage Publications) 577, 579.

²⁵ Bridget Byrne 'Qualitative Interviewing' in Clive Seale (ed) *Researching Culture and Society* (4th Edition, Sage 2018) 220-1.

²⁶ Alice Yeo and others, 'In-Depth Interviews' in Jane Ritchie and others (eds) *Qualitative Research Practice* (2nd Edition, Sage 2014), 182.

²⁷ Byrne, n25, 219.

²⁸ Kathy Charmaz, *Constructing Grounded Theory* (2nd Edition, Sage 2014)18, 23.

²⁹ Michael Myers and Michael Newman, 'The Qualitative Interview in IS Research: Examining the Craft' (2007) 17 *Information and Organization* 2, 3-4; Silverman, *Doing Qualitative Research*' (n674) 132; Silverman, *Interpreting Qualitative Data* (n684) 181.

³⁰ Byrne, n25, 220.

³¹ David Silverman, *Doing Qualitative Research* (4th Edition, Sage 2013) 130.

³² Brinkman, n24, 588.

approval for the interviews was obtained within a month of confirmation of funding. Adopting a relatively standard approach to interviewing, all prospective interviewees were then emailed the project information sheet, details of the key questions being asked (interview guide) and a consent form. Interviewees were asked to return the consent form before the interview, confirming in writing that they agreed to being interviewed and to the taking of anonymised interview notes. (Guaranteeing anonymity was crucial to encouraging respondents to speak openly). Interviews were conducted from mid-November to mid-January, with initial findings published at the end of January. The speed with which it was possible to conduct interviews, collate and analyse data and publish findings was a direct result of the interview methods adopted.

Interviews were conducted online; an inevitable consequence of the pandemic, with institutional restrictions and the second UK lockdown preventing face-to-face interviews. Much research confirms that the online interview is a viable alternative to face-to-face interviews,³³ provided participants have appropriate technology and the ability to use it,³⁴ and that interviewer and interviewee have good quality, fast internet connections and can sustain audio-visual connections.³⁵ Researchers suggest conversation and response quality is much the same in online as in face-to-face interviews.³⁶ For this project, it is possible that using online interviews may, as the literature suggests, have facilitated the scheduling of interviews.³⁷ It is questionable whether so many interviews could have been conducted with stakeholders throughout the UK within such a short time period had it been necessary to schedule face-to-face interviews.

Each interview was conducted by two interviewers from the OMDDAC team, with one interviewer leading on questioning whilst the other(s) focused upon contemporaneous

³³ Hannah Deakin and Kelly Wakefield, 'Skype Interviewing: Reflections of Two PhD Researchers' (2014) 14(5) QRJ 603, 604; Yeo and others (n734) 182.

³⁴ Deakin and Wakefield, *ibid*, 605; Susie Weller, 'The Potentials and Pitfalls of using Skype for Qualitative (Longitudinal) Interviews (National Centre for Research Methods Working Paper 4/15, 2015) eprints.ncrm.ac.uk/3757/1/Susie%20Weller.pdf accessed 23 February 2020, 9, 15; Valerio Lo Iacono, Paul Symonds and David Brown 'Skype as a Tool for Qualitative Research Interviews' (2016) 21(2) SRO 12.

³⁵ Jessica Sullivan, 'Skype: An Appropriate Method of Data Collection for Qualitative Interviews?' (2012) 6(1) The Hilltop Review 54, 59; Deakin and Wakefield (n819) 605.

³⁶ Hannah Deakin and Kelly Wakefield, 'Skype Interviewing: Reflections of Two PhD Researchers' (2014) 14(5) QRJ 603, 605, 610.

³⁷ Nigel King and Christine Horrocks 'Interviews in Qualitative Research' (Sage, 2010) 79.

notetaking. Pair interviewing had previously been used by several members of the OMDDAC team, who were able to both explain the approach to other team members, and to support those who had not previously undertaken pair interviewing by conducting initial interviews with them. Pair interviewing, again, undoubtedly contributed to the success of WP1. The use of two interviewers, with one taking notes, enabled the process of interviewing and analysis to be completed more quickly than if interviews had been conducted individually, recorded and transcribed. Whilst the literature suggests note-taking is slow and often incomplete, raising validity issues,³⁸ this was not the team's finding. Here, the questions were relatively narrowly drawn, and interviews lasted less than an hour. It was possible for one interviewer to make contemporaneous notes, whilst the other focused on questioning. With all notes being checked and added to by the co-interviewer following the interview, the project team ensured that they captured all the key points interviewees made. The speed with which data could then be shared across the team contributed to the swift analysis of WP1 findings and progression to WPs 2 and 3. The fact that one interviewer focused upon questioning and listening to the interviewee rather than note-taking ensured the necessary rapport between researchers and interviewees was maintained.³⁹ Having two researchers in each interview, also meant that follow up questions came not only from the lead questioner but were also sometimes raised by the notetaker (who often had a different disciplinary background or research interests to the questioner), with the depth and breadth of information gathered thus being extended.

A semi-structured interview guide was used to ensure all interviewees were asked the same key questions in the same way, although not necessarily in the same order, with follow-on questions or probes then being used to respond to and delve into participants' comments, and to focus the conversation on emerging issues of importance.⁴⁰ The interview guide was shared with participants prior to the interview, allowing them to consider and reflect upon

³⁸ Nigel Fielding and Hilary Thomas, 'Qualitative Interviewing' in Nigel Gilbert (ed) *Researching Social Life* (3rd Edition, Sage 2008) 257-8; Bridget Byrne 'Qualitative Interviewing' in Clive Seale (ed) *Researching Culture and Society* (4th Edition, Sage 2018) 233.

³⁹ Alice Yeo and others, 'In-Depth Interviews' in Jane Ritchie and others (eds) *Qualitative Research Practice* (2nd Edition, Sage 2014) 184-5.

⁴⁰ Barbara DiCicco-Bloom and Benjamin Crabtree, 'The Qualitative Research Interview' (2006) 40 *Med Educ* 314, 315; Svend Brinkman, 'The Interview' in Norman Denzin and Yvonna Lincoln (eds), *The Sage Handbook of Qualitative Research* (5th edn, Sage 2018) 578-9.

the questions prior to interview. The use of such an interview guide as a starting point for discussion was vital given that interviews were undertaken by different teams of people working in pairs, and, as noted above, often from different disciplines and, because of the pandemic situated in different locations. The interview plan ensured all interviews covered the same core questions. The team could, of course, have opted for even greater uniformity by using a 'structured' or standardised interview, where the question wording and order is rigid. That would, however, have meant interviewers were unable to follow up on issues interviewees thought important, and would have prevented interviewers from following up on points of clear relevance to the research.⁴¹ Given the diverse backgrounds of the interviewees, it was vital to be able to explore interviewee's different experiences of data-driven approaches.

Ultimately the semi-structured, pair interviewing approach resulted in the production of a vast amount of data. All team members were invited to review this data and to contribute to the subsequent analysis of this data. This data analysis, which combined analysis of data from the interviews to identify projects considered to be most significant or important by research participants, alongside quantitative scoring using a systematic scoring system or matrix and expert review by project partners and the project team to validate and confirm a final shortlist of case studies which were the focus of WP2. The interviews also, crucially, enabled the team to develop insight into the many different ways stakeholders understood the term 'data-driven approaches,' to identify specific approaches that had been adopted in areas as diverse as policing, health, and government, to pinpoint specific technologies and uses of data which some interviewees considered problematic, and to identify individuals and organisations that would need to be consulted as part of WP2.

6. A think-tank's perspective on remote interviews during the pandemic ((Keith Ditcham, Ardi Janjeva, Royal United Services Institute)

Considering some of the more sensitive national security issues that RUSI is often engaged in, 'in-person' interviews were traditionally a staple of the RUSI team's research methodology.

⁴¹ n24, 579.

The pandemic therefore offered a useful experiment in seeing what participants and researchers were actually 'able' to do once the status quo was no longer an option. We were encouraged by how receptive our stakeholders were to the video interviewing technique, although by the project's start date in November, the research team and participants would have been well versed in the new virtual etiquette. Although there may be a cost in terms of rapport building with interviewees (in-person interviews are usually more conducive to informal interactions and spending time in other places of work) there is a clear benefit in the increased number of research interviews that can be scheduled in any given day. Other financial and environmental benefits to remote interviewing have also been recognised by RUSI during remote working (the savings created by remote interviewing has allowed more funding to be channelled to research-related activities).

With remote interviewing becoming the norm, it has forced the team to think beyond some of the pre-existing London-based networks (even though these still proved to be useful in the remote context). With distance no longer a limiting factor, we were able to capture a whole group of interviewees who we would likely not have spoken to otherwise, and this has gone a long way to ensuring that OMDDAC's research is representative of a broader range of communities and interest groups, and as such, the UK as a whole. However, the research team could not merely assume a willingness to participate from these groups; we had to devise ways to encourage people who were not necessarily very familiar with RUSI to commit time to our research project. The shorter format may have been more acceptable to busy interviewees as well as mitigating the challenges of 'screen fatigue' and balancing personal commitments associated with working from home during the pandemic.

7. Developing public perceptions surveys within an interdisciplinary project: challenges and benefits (Guangquan Li and Mark Warner, Northumbria University)

In Work Package 3 (WP3), the OMDDAC team conducts the Public Perceptions Study, a survey-based study to gauge public attitudes towards the collection and use of data for responding to COVID-19 in the UK. This study is designed with a two-stage structure. Through a national online survey, Stage 1 collects quantitative data from a representative sample of the UK population to gain overall insights into public attitudes in this area. Drawing on findings from the Stage 1 survey, Stage 2 conducts follow-up studies, collecting further quantitative as well as qualitative data, to gain deeper understanding of the "big picture".

Throughout the pandemic, the power of data and the benefits of data-driven approaches have been seen across the society^{42, 43}. It is important to understand what the general public thinks about data collection and data use in the context of resolving national emergencies. In developing this understanding within an emergency context, we can draw from prior research on data sharing and use perceptions to understand how the crisis has affected public thinking.⁴⁴ The basis on which the Stage 1 survey was designed are data-sharing scenarios that are ‘general but realistic’, as opposed to focusing on specific data-driven technology. In our view, a limitation of the latter would be that the findings are specific to the technology under investigation. As a result, the opportunity to draw generalised conclusions, which would be valuable to inform the development of future data-driven methods, might be lost. These issues were discussed with the wider OMDDAC team with their input incorporated into the further refinement of the survey design.

We approached the construction of the data-sharing scenarios by first decomposing the case studies in WP2 into constituent parts – the key attributes of the case studies – then building the scenarios based on these attributes. The resulting scenarios, therefore, not only are representations of the case studies but also generalise them. When combined with statistical modelling, an output of this approach is that one can reconstruct a data sharing scenario based on either a data-driven approach that has been developed or will be developed in the future to predict the general public’s willingness to share data under such a scenario.

Formulating survey questions to examine how attributes of the case studies affect willingness to share data posed another challenge. The traditional way of considering one attribute per question (e.g. “How willing would you be to share your mobility data in responding to COVID-19?” with a Likert scale to measure willingness) was initially considered but subsequently ruled out. That is because it failed to capture the reality that decisions (willing to share data or not) are made in the presence of *multiple criteria*, for example, what data are to be shared, with whom the data are being shared and under what circumstances (with the nation facing high or low risk of COVID-19) that people are asked to share their data. All attributes are therefore required to be incorporated *jointly*. To achieve this, we employed the multiple-

⁴² Dawda, Sneha, et al. "OMDDAC Snapshot Report 2: Tech-driven approaches to Public Health." (2021).

⁴³ Janjeva, Ardi, et al. "OMDDAC Snapshot Report 3: Policing and Public Safety." (2021).

⁴⁴ Lewandowsky, S. *et al.* Public acceptance of privacy-encroaching policies to address the COVID-19 pandemic in the United Kingdom. *PLOS ONE* 16, e0245740 (2021).

attributes conjoint design⁴⁵, a design that offers an elaborate way to represent the multiple-criteria decision-making process. Under this design, participants of the survey are presented with two different data-sharing scenarios, both being characterised by the attributes. They are asked to choose the one under which they are more willing to share data. This comparison is then carried out over a number of different scenario pairs. An example of the paired-scenario comparison is given in *Figure 1*.

Figure 1. An illustration of the paired-scenario comparison in the multiple-attributes conjoint design. To ensure participants' fully understanding of the terminology used, medical/mobility data and identifiable/anonymous data, detailed explanation is provided first at the beginning of the survey. Then, within each comparison, brief explanation of each term is provided when the participant hovers the mouse over the text with a dotted underline.

In which of these two scenarios are you more willing to share your data?

Scenario A	Scenario B
<p>We are in Alert Level 5</p> <p>You are sharing <u>Medical Data</u></p> <p>with <u>Public Health England</u></p> <p>Your data is <u>Identifiable</u></p> <p>and used to monitor if the current alert level, and its associated restrictions, is appropriate.</p>	<p>We are in Alert Level 1</p> <p>You are sharing <u>Mobility Data</u></p> <p>with <u>your Regional Police Force</u></p> <p>Your data is <u>Anonymous</u></p> <p>and used to monitor if the current alert level, and its associated restrictions, is appropriate.</p>

Presented in *Figure 1* are four attributes:

- Risk level: the different Covid-19 alert levels in the UK;
- Data type: medical data or mobility data;
- Data holder: sharing data with different types of organisations;
- Data storage: data are anonymised or data are identifiable.

The first one sets out the pandemic context under which the data-sharing decision is asked to make while the latter three relate to the data-driven methods. This set of attributes is a result

⁴⁵ Hainmueller, J., Hopkins, D. J. & Yamamoto, T. Causal Inference in Conjoint Analysis: Understanding Multidimensional Choices via Stated Preference Experiments. *Political Analysis* 22, 1–30 (2014).

of many rounds of discussions within the WP3 subgroup as well as in consultation with the whole OMDDAC team. The attributes considered here aim to capture the essence of the WP2 case studies (also the Stakeholder Mapping Interviews from WP1) but also give rise to a survey with a manageable number of questions.

The latter leads us to the question of ‘How many attributes can we investigate realistically?’ While one would like to include and investigate many of such attributes in the survey, the more attributes we include, the more paired-scenario comparisons will be required. Survey fatigue, whereby participants become bored and tired of the questions and perform sub-optimally as a result, becomes an issue. We approached this through two steps. Starting from an initial list of attributes drawn from the Stakeholder Mapping Interviews from WP1 and the case studies in WP2, we narrowed it down to include attributes that are considered to be essential to represent the data-driven approaches identified in the two work packages. The resulting list was then subjected to the statistical consideration that whether the fixed number of comparisons would yield sufficient information to infer the effects of these attributes on willingness to share data.

It is important to highlight that these two steps were taken iteratively and tackling this challenge, and in fact many other challenges in WP3, has benefited from the interdisciplinary nature of OMDDAC. The multidisciplinary expertise within the OMDDAC team drives forward the national survey. From a statistician’s perspective, both points above are illustrations of those stated in Haining and Li in the context of undertaking statistical analysis: “a statistical analysis is an iterative process, and each iteration reveals new insights into the system under study” and “the theoretical [and contextual] understanding of the system is an integral part of the statistical reasoning process. A statistical model cannot be separated from its subject area”.⁴⁶

At the time of writing, the Stage 1 survey was still in the development stage. Piloting is highly relevant and beneficial for this stage of the process. Comments from piloting, no matter how small the scale is, are valuable for improving the wording of the questions, identifying errors and/or unambiguity and simply understanding how long the survey takes.

⁴⁶ Haining, R. and Li, G., 2020, *Modelling Spatial and Spatial-Temporal Data: A Bayesian Approach*. *Routledge & CRC Press*.

In the process of designing a survey, researchers often become so embedded within the process that it can be difficult for them to take a step back to evaluate the entire participant journey. Unlike the preceding interview studies in WP1 and WP2 where clarifications and follow-up questions could be asked, the survey method used in WP3 did not offer these luxuries. We had the difficult task of designing a survey that needed to be understood by a representative sample of the population. Therefore, we needed to ensure that questions being asked were in fact measuring what we were intending to measure. To do this, piloting was critical.

In our early piloting we used a qualitative usability method known as ‘think aloud’⁴⁷. Pilot participants were asked to progress through the study whilst verbalising their thoughts and actions. Whilst this is a somewhat unnatural experience for participants, it allowed the WP3 team to capture issues such as confusion with the user interface, and miscommunication and lack of understanding within the questions. These insights were then used to refine the survey tool prior to further piloting. In essence, this stage of piloting allowed the researchers to ‘sit’ (albeit virtually) next to participants and experience the survey with them, capturing their inner thoughts, and asking probing questions to ensure that the measures being developed were being understood and were therefore likely to produce data of a high quality.

Developing and deploying a nationally representative survey is a complex task, one that requires a wide range of expertise. The interdisciplinary nature of OMDDAC brings together researchers from many fields: data protection and technology law, computer science, statistics and behavioural science, each contributing to the survey design in a unique way. We have already discussed some of the challenges we faced during this interdisciplinary project and many of these were also felt when developing these surveys. Much of what has been discussed relates to communication, and the difficulties in communicating often complex ideas to colleagues in other disciplines. Yet, as we developed this study, we found opportunities for learning, for challenging our own ways of working and our own preconceived ideas and knowledge. It created opportunity for the researcher, from whom the idea originated, to think hard(er) for effective communication, and opportunities for the idea to develop further following the questions asked and contributions made by other

⁴⁷ Nielsen, Jakob. Usability engineering. Morgan Kaufmann (1994).

researchers from different angles. The latter opportunity arising from an interdisciplinary research project is not limited to individual ideas but spans across all work packages within the project. Researchers from different fields provide different, and often new, perspectives of the project and, when taken collectively, they lead to the success of the research.

8. Conclusion

The reflections above suggest several lessons that universities, funding bodies and research teams should incorporate into future policy, grant requirements and training. First, interdisciplinarity is more than merely a series of work packages led by different disciplines. True interdisciplinarity means genuine involvement of all relevant disciplines in the aims and objectives of the project, and production of the outputs. The theoretical benefits of an interdisciplinary research approach will however only be realised by designing the integration into every aspect of a project - it cannot be assumed that integration will somehow happen without effort. This kind of proactive integrated design should be sought out by funders in their funding calls and decision-making processes, and facilitated by new university processes and training programmes that can support researchers to carry out, and managers to lead, distributed interdisciplinary projects and cut across disciplinary and departmental barriers that often exist. The challenges of communication and understanding that integrated interdisciplinarity creates can be transformative – as Li and Warner identify above, researchers are challenged ‘to think hard(er) for effective communication and opportunity for the idea to develop further following the questions asked and contributions made by other researchers from different angles’ leading to more powerful and insightful research outcomes.

Secondly, methods of remote interviewing and engagement have no doubt expanded the range of individuals and organisations that the project has been able to reach, and provided opportunities for team members from different disciplines to ‘pair’ up and ensure that project interviews incorporated a range of perspectives. This breakdown of the barriers of time and space has had considerable advantages from an inclusivity and diversity perspective. Remote interviews do however require different practical approaches, in comparison with more traditional methods, in particular the paired approach to interviewing, and shorter interviews to account for limitations on rapport-building and screen fatigue.

Finally, remote methods of communication have considerably aided our team's productivity in the current distributed home-working environment. However, we had the benefit of existing relationships of trust between many of the OMDDAC team. Future remote distributed research projects will need to give specific thought to issues of collegiality so that researchers are not isolated from opportunities to build working relationships and academic networks. There may well be a need for *more* online meetings - to develop collegiality and interdisciplinarity - and different research patterns (such as an increased number of shorter interviews) which should be borne in mind in workload time allocations.

It will be tempting for universities and funders to assume that research projects can continue to be conducted in a mainly remote manner and therefore, that budgetary savings can be made by reducing time allocations, travel and academic networking. In the long term, this will be a false economy and may well result in less effective research outcomes and staff overload. It is to be hoped that our reflections in this article will enable research projects to incorporate the best of remote methodologies while being prepared for some of the challenges. There is no such thing as perfect research. Qualitative researchers should be aware that 'the knowledge they produce reflects their location in time and in social space.'⁴⁸ Covid has impacted on how we do research in both time and social space; the key is to make sure we take the best of both models. In that way, the pandemic's lasting effect as far as research is concerned could be a positive one.

⁴⁸ Bryman, A. (2016) *Social Research Methods* (5th ed.). Oxford. Oxford University Press.