# Trust in Statistics

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ABSTRACT: Evelyn will reflect on insights from the ARITHMUS project, which involves the study of several National Statistical Institutes, UNECE and Eurostat as they remake methods of knowing populations*.* From questions of the politics of working with administrative and big data to technical and infrastructural barriers to innovating methods, she will discuss the role of trust in securing both professional’ political and public confidence in statistics. How is trust understood, demanded and performed? And what does it mean to trust statistics at a time when numerous new actors are generating competing data, methods and population knowledge?

PRESENTATION:

Thank you for this invitation and the introduction. It is my great pleasure to join you here today in a different capacity from that which I usually engage with ONS and other national and international statistical offices. Before I say more on that I’ll first introduce you to the research I have been doing and which brought me here. It is a project I lead called Peopling Europe: How data make a people – what we refer to in short as ARITHMUS. I know especially in the wake of the referendum it is challenging to talk about a project concerning Europe but I hope to convince you that the questions I am posing will perhaps become ever more important and relevant. To make this case I’ll first provide some more background on ARITHMUS.

In brief it is a five-year European Research Council funded project that involves a multi-sited and multi-method collaborative ethnography of the data practices of EU national and international statisticians as they innovate and remake their methods of counting and knowing populations and other phenomena such as the economy. Basically we are studying how counting and knowing populations is undergoing significant innovation and change because of new digital technologies and Big Data sources such as data from mobile phones, search engines and social media as well as government administrative databases. The project involves a team of six researchers in addition to myself as PI who is leading on international organisations of Eurostat and the statistical division of the UNECE. Four postdoctoral researchers are leading on the study of national statistical institutes: Baki Cakici, who some of you have perhaps met or seen around the ONS offices, is leading the study of the UK, Francisca Grommé is leading on the Netherlands, Stephan Scheel on Estonia, and Funda Ustek-Spilda on Turkey. One doctoral student, Ville Takala is leading on Finland.

Basically our question is how do methods and the forms of data they generate have consequences for how we statistically know not only national but EU populations? It is based on a premise such as that advanced by anthropologist James Scott in his well-known study *Seeing Like a State*, that creating European population statistics is a practice that can be understood as more than simply about collecting data. Like the forging of national identities, it is also about constituting a European identity, and contributing to how people come to understand themselves as Europeans. This question is particularly timely as we are facing a fundamental change in the methods and technologies of population statistics and it is within the context of that change we can open up this question comparatively. That means that rather than approach this as a theoretical question we can study this as a practical and empirical question.

Empirically, this question really struck me back in 2013 when I attended a meeting of housing and population experts at the UNECE. A map produced by a UNECE task force on census methodology was shown to illustrate what we could call the diversification or perhaps fault lines in the methodologies of doing population censuses across the 56 countries of the UNECE. It shows the division of methods in the 2010 enumeration practices of EU states with the predominant use of population and administrative registers in the north, a mix of registers, surveys and traditional censuses in the centre, and primarily traditional censuses in the south and east. As one statistician put it, it shows the fracturing of methodological regimes and different national models of population. Since that time, as many of you may well know, the move to registers has proceeded apace from 3 in the 2000 round to probably 14 in 2020. But more than that has changed since that meeting.

Big Data was hardly spoken at those early meetings but now it is hard to find an agenda that doesn’t at least mention this new form of data. We also now have innovation labs like that here at ONS and in the Netherlands, BD task forces and projects at Eurostat, the UNECE sandbox, Big Data roadmaps, data scientists working within statistical offices, new technologies such as the iwatch, google glasses, fingerprint ID and touchpay, and developments such as the Internet of Things and driverless cars, and on. At the same time there are pressures to produce statistics that are more timely, granular, detailed and all within declining resources. All of these changes are constituting and demanding what many statisticians refer to as a culture change in how we know populations.

How then to study this? We are using a method that has a long tradition in the social sciences, that of ethnography as a method of following and understanding expert cultures and change through an immersion in organisational workplaces and work practices. From studying organisational action at the IMF (*Inside the IMF*, by Richard Harper) to the practices of prediction at the Met Office (*Authors of the Storm*, by Gary Fine) and the politics of culture at the European Commission (*Building Europe*, by Chris Shore), as a method each of these studies have involved following practitioners to understand the craft they do and how they juggle and negotiate professional, political and organisational cultures especially in the face of change.

To do this of course requires first of all access and the support of key people within organisations and here I would like to note one form of trust that I refer to in the title of my talk. It is the trust in the social scientific value of opening up organisations to research, which requires a leap of faith because the benefits to an organisation may not be easily identifiable at the outset. And it is on this point I would like to acknowledge the support and leap of faith of several people at ONS who have done this, in particular Pete Brodie, Jane Naylor, Nigel Swier as well as the National Statistician, John Pullinger.

So what specifically have we been doing? I attend and observe loads of meetings and conferences of Eurostat and the UNECE on censuses, Big Data, modernisation and so on both large forums but also smaller settings such as task forces at Eurostat. At national sites other ARITHMUS researchers also attend various meetings but also workshops, labs and group discussions. And all of us spend time at the various sites to also conduct periodic interviews, engage in informal discussions over coffee and lunch, collect loads of documents, but also follow websites and wikis, listservs and so on. And finally I should mention that engage with an advisory group of representatives from across all of the organisations we are studying who meet with us annually to discuss our field work and provide feedback and ideas about the work we are doing. We have been doing this for about 18 months and have just now completed this stage of the project and are now turning to analysis and writing. So what I am presenting today are some preliminary reflections and in relation to a particular theme – trust – which we have found to be a central stake and challenge involved in what we call the culture change required to innovate methods and statistics.

There are many ways I could approach this but I choose a particular one based on a classic work in the history of scientific thought and change and which I think provides some interesting insights about innovation that cuts across academic and practitioner communities. It comes from what you might rightly consider an unusual example, Robert Boyle’s seventeenth centuryexperiments in pneumatics studied by historians of science Steven Shapin and Simon Schaffer and written up in their book *Leviathan and the Air-Pump* in 1984. It is a book that has been enormously influential in historical studies of science especially in relation to moments of major scientific and knowledge change where key scientific givens such as facts, interpretations, experiment, truth were fundamental to establishing new matters of fact. It has relevance for thinking about how new forms of data and methodological innovations can come to be accepted and legitimised as ‘official statistics’.

Like statisticians who are seeking ways to legitimate new forms of knowledge and official facts about populations, Boyle sought ways to produce ‘authentic knowledge’ about matters of scientific fact about the workings of a vacuum, that could be stable, credible, and beyond dispute. How Shapin and Schaffer studied this was through examining the work habits, rituals, social conventions and organisational structures and cultures of Boyle’s scientific community rather than focusing just on what they said about what they did. What they document is that Boyle approached the legitimation of new scientific facts not through the elaboration of a theoretical argument but through an experimental method. Specifically, his experiments involved constructing an elaborate air pump to demonstrate that air indeed could be emptied from a cylinder to achieve a working vacuum. He was successful in doing this but to establish the results of his experiments as matters of fact required mechanisms of collectivising and multiplying witnessing of the working of an air pump beyond his laboratory. This was achieved first through demonstrations before authoritative male Oxford scientists. Material demonstrations, in other words, that could be witnessed was key to not only validating but having trust in Boyle’s truth claims. But this was limited to a very few number of scientists. How he legitimised this as a matter of fact beyond a small number of witnesses was achieved through three means.

One involved detailing the material infrastructure so that other scientists could replicate experiments. However, these often failed as the materials were delicate and costly to assemble. Instead other means were invented. In addition to the material technologies two others were identified two. One concerns social technologies of scientific rules and conventions for considering knowledge-claims; these included rules for the conduct of experiments. Along with this it was a third that Shapin and Schaffer identified as most effective and which they called literary technologies, that is, detailed experimental reports consisting of words and images that more easily enabled others beyond the laboratory to imagine experiments without directly witnessing or replicating them. Beyond speech, seeing demonstrations in images enabled matters of fact to be witnessed and confirmed beyond the laboratory. It is this ‘virtual’ witnessing through literary technologies that I think is relevant to understanding the role of demonstrations in the legitimation of new forms of data and methods in the making of official statistics.

Now I realise that there are limits to drawing too close a parallel to innovation in our times but I think we can draw insights about what is required to fundamentally change any regime of knowledge and truth. We can also think about how the literary technologies of our times provide new mechanisms unimaginable in Boyle’s time such as how digital demonstrations, visualisations and documentation expand the possibilities of dissemination and witnessing.

I have named this technologies of trust because we are at a moment of distrust in experts. While this distrust is not evenly distributed amongst all expert communities, I think it is safe to say that there is a general concern with the validity of expert knowledge. That said, a recent NatCen Social Research report on the results of a survey of public confidence in official statistics (commissioned by the UK Statistics Authority and drawing from the British Social Attitudes survey) showed that 81% of those who expressed an opinion trust the statistics produced by the ONS and 88% per cent trust the ONS as an institution. In a survey hosted on the StatsUserNet website, members generally gave more positive answers than the public as a whole. 97% said they trusted the statistics of the ONS and 96% trusted the institution.

Maintaining that trust at a critical moment of innovation and change is a key challenge. Trust of course is already recognised within the statistical community as expressed through a social technology and convention of principles such as the following two:

It has the dual purpose of, on the one hand, improving trust and confidence in statistical authorities by proposing certain institutional and organisational arrangements, and, on the other hand, reinforcing the quality of the statistics they produce and disseminate, by promoting the coherent application of best international statistical principles, methods and practices by all producers of official statistics in Europe.’ (European Statistics Code of Practice)

To retain trust in official statistics, the statistical agencies need to decide according to strict professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data. (UN Fundamental Principles of Official Statistics)

But what these do not express and which we as social scientists witness is how that involves developing mechanisms of trust within organisations, between and amongst practitioners across various departments and expertise, of methodologists, statisticians, managers, system engineers, and so on. Indeed, it is with amazement that we witness how innovation and change are challenging to accomplish within large complex organisations. But of course trust is not only an internal matter. It must also be secured between organisations within national and international communities where recognition of innovation is both professionally and politically required from peers, users, politicians, academics and broader publics.

In closing I think innovation in official statistics calls for attending to technologies of trust, of not just demonstrating how new forms of data and methods can generate new knowledge about populations and other phenomena, but also innovating how we do so through social and literary technologies or what is sometimes referred to as communicating. And finally, I mentioned at the beginning that there are benefits of a social scientific study such as ARITHMUS and one that I would like to end with is that understanding the changing regime of official statistics is critical for us as educators in how we come to organise and structure our training of students especially in methods including statistics, data science and digital social science. As I noted to do so also calls for partnerships and trust between the academy and practitioner communities which I think is ever more critical at this moment of rapid technological change within which we find ourselves.