Event report: AI in health and care – how do we get it right?

Sophie Taysom*

How do we use technology for public good? What are the opportunities and challenges? These were just some of the questions discussed at the Bristol Health Partner's event, AI in health and care: how do we get it right? The event held on 28 November 2018 in Bristol City Hall was attended by over 340 people.

This note of the meeting provides a sketch of some of the key issues, themes and questions emerging from the evening. Also included are some Twitter highlights. You can continue the conversation on Twitter @BristolHealthP or email hello@bristolhealthpartners.org.uk

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The event's proceedings were kicked off by Lisa King, the Chief Operating Officer for Bristol Health Partners, and Chaired by Julian Walker, R&D Director, Avon & Wiltshire Mental Health Partnership NHS Trust. It was hosted by Bristol Health Partners, a unique and strategic collaboration between the city region's major health and academic institutions, covering the Bristol, North Somerset, and South Gloucestershire area.

What is clear when speaking about Artificial Intelligence (AI) is that narratives swing from the outlandish to the terrifying. But in cutting through the hype, there is a real sense of optimism about the potential of AI based technologies to positively impact on health and care.

Underpinning this is a need for what will be a long running conversation about the opportunities, and ethical and technical challenges, that AI brings.

The speakers for the event were:

- **Dr Ben Goldacre**, science journalist and Chair of Government's new health technology advisory board

- **Dr Natalie Banner**, Lead - Understanding Patient Data

- **Deborah El-Sayed**, Director of Transformation, Bristol, North Somerset and South Gloucestershire Clinical Commissioning Group

The language of AI and public attitudes

Natalie Banner was the first of the main speakers. Her focus was on the importance of language. On AI, there is a real risk of hype and with it, an over promising of what can be delivered. There is now a real sense of anxiety, in part due to the dire predictions about AI found in the media and this hype heavy atmosphere.

So how do we understand AI? Natalie Banner uses the definition from the House of Lords Select Committee on AI report, _AI in the UK – Ready, willing and able?_ –"AI is technology with the ability to perform tasks that would otherwise require human intelligence". Within this, much of the focus is on machine learning and the ability for systems to learn from experience and over time. This enables the making of predictions, based on data inputs, finding patterns and learning to classify. We're seeing this in areas like radiology where computer systems can 'learn' to detect breast cancer. Key to this is an enormous amount of data that also needs to be representative.

Many of the potential applications of AI are seemingly mundane. Within health, there is a real potential for AI systems to be used in areas such as bed management in hospitals and triage in A&E. And there's a lot of excitement about the potential application of AI for early research and drug discovery.

So given these applications, what makes AI so special? Why is work being done to understand public attitudes? We don't for instance examine public attitudes towards the introduction of MRI machines.

First of all, AI isn't magic. Rather, it is developed using a lot of data, and as part of this we need to understand what's happening to that data. Second, data matters to us. Inappropriate use and sharing of data, as was the case with the Care.Data programme, can lead to a significant backlash. Third, we are swimming in a sea of data, as patients and as members of the public. We need to develop a better understanding of how data is collected, shared, and used.

It is on this basis that Natalie Banner argues that we need to understand public attitudes. What is clear is that AI is a term that is poorly understood. Work on unpicking the issues with this has begun with the Academy of Medical Sciences report, _Our data-driven future in healthcare - People and partnerships at the heart of health related technologies_; and the Department of Health and Social Care's _Initial code of conduct for data-driven health and care technology_. But there is still a long way to go in terms of wider public engagement on the development and application of AI in health and care.

On the importance of data

Ben Goldacre agrees that terminology is important. For him, there is a lot of fatuous chat around AI that is both frustrating and disappointing. What we should really be talking about is data driven technologies.
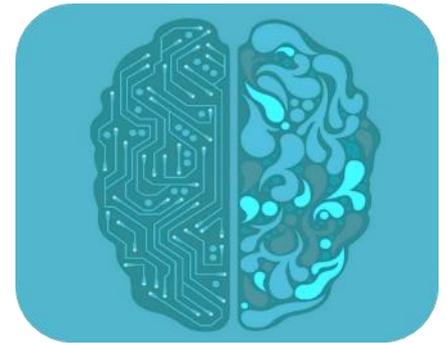
Data is critical - it's how we find out which drugs work, how we plan health and care services. He points to the example of OpenPrescribing, one of a range of projects built by the EBM DataLab to help make complex medical and scientific data more accessible and make a real world impact, in this case, in shaping prescribing decision.

And there are questions we need to ask about data driven technologies, how algorithms learn, and their applications in the real world.

When crunching data, we need to understand what we've really learned. He points to the example of an application of deep learning to detect pneumonia in chest radiographs. The core issue is, is the detection of pneumonia based on relevant data, or is it derived via inference? In this case, while it seemed that this application of machine learning could better detect pneumonia from a radiograph than radiographers, it could not. Instead, what was identified was an association – there was a particular group of patients that were x-rayed using a particular machine, and it was reference to this machine in the image that was being picked up via machine learning. What this suggests is a real need to interrogate the outputs from data driven technologies.

This type of inference from the data is not new. He spoke of the parable about the US Army training a programme to differentiate between American and Russian tanks with an accuracy rate of 100%. Further analysis revealed that the learning was by inference – Russian tanks were photographed on a cloudy day, American tanks on a sunny day. The decision as to whether a tank was identified as Russian or American was determined by the brightness of the image. To add another layer of interest, this example was found to be an urban legend!

This is important. There is a need for clarity as to what we're comparing data sets against and where and what inferences may come into play.

In terms of data driven technologies in health, Ben Goldacre flags the example of Babylon which is one of the biggest players in the field in the UK. They provide an interesting illustration of how new service models might integrate with existing ones, but also how there is a lack of infrastructure to do this in a managed fashion. He also gave an account of the reported evidence, saying the critical evaluation of the product is not as substantive as it might appear. This raises important questions including: How can the NHS manage the selective picking of patients in GP services? And what evaluations should be required for digital health technologies? For example, there is no yellow card system for algorithms, whereby health professionals and others can flag safety concerns.

His talk ends with a call to action:
- to help innovators with the tools required to meet the need for evidence;
- to support the development of and career pathways for data analysts; and
- to create shared repositories for work and learning.

The local context

Deborah El-Sayed, the third speaker of the evening, raised the important issue of how do we get this right locally?

Bristol has a rich heritage when it comes to health data. This is exemplified by the work of Dame Edith Körner, a local resident who did the first major report on standardising NHS data. Dame Edith's work paved the way for the digitisation of healthcare data.

Deborah El-Sayed then went on to provide a number of personal reflections on applying data during the 1990s. The example she gave concerned data collection with respect to medication for patients being held in medium secure psychiatric facilities. The purpose was to understand patterns of treatment, and when patients became ill again. But data is only helpful insofar as it is used. Continual behaviour recording provided lots of data, but at the time there wasn't the ability to analyse it in any meaningful way. What was really achieved by collecting all this data?

Today is different and through better data analytics, we have the ability to analyse large data sets. Within the local context, this is exemplified by Connecting Care which links GP patient records with social care data, wider health data, and end of life data. This can give clinicians a holistic view of patients. Aggregating this to a population level will be important as it helps shape decisions on where to invest effort and resources to allow the local health and care system to identify and target need.

But we need to approach this with cautious optimism and ensure fundamental building blocks are in place. AI will not solve all our problems. But there are some real opportunities with AI and robotics, in research, diagnostics and treatment, and to support decision making. This won't all be smooth sailing and there will be troughs.

For Deborah El-Sayed and for Bristol Health Partners, there are choices to be made. Do we wait to pick up data driven technologies once they been tried, tested, and robustly evaluated elsewhere, or do we position ourselves as leaders in this emerging field?

Bristol has an incredible opportunity to take a leading role in AI in health and care. This is shaped by both a strong ecosystem made up of components including Bristol is Open, The University of Bristol's partnering with the Alan Turing Institute, through the University of West of England's AI Group, the repurposed planetarium (The 'Data Dome'), and being the location for the Avon Longitudinal Study of Parents and Children. What connects all of these strands - academia, the NHS and local authorities - is real desire to make people's lives better.

Next steps

This event is just the start of the discussion. Bristol Health Partners is considering the issues raised about how we can use data to make people's lives better, and what's needed to make this happen.

One immediate action is for Bristol Health Partners to consider how to move forward on the supporting the people that will make this happen – access to training, creating career paths, and creating networks for data analysts; and support them to pool their skills and knowledge openly, in public, and collaboratively.

And there are also a number of questions that need to be discussed and taken forward as raised during the talks and by members of the audience. These include but are not limited to:

- Where do we start in using AI in health and care? Where can it add the most value both in the short and the longer term?
- What are the factors needed to make this happen?
- How do we ensure that the secure sharing of health and care data with industry provides a value return to the public sector?
- How do we appropriately regulate and licence AI algorithms?
- How do we build accountability into systems if mistakes are made?

With a huge thanks to all those who participated. And remember, you can share your thoughts via twitter @BristolHealthP or email us at hello@bristolhealthpartners.org.uk

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Dr. Yvette Pyne 🌈
@yvettepyne
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An inspiring talk from @debselsayedd reassuring me that this beautiful city is not only the place I love to call home but can also be where I develop an exciting and meaningful career in AI in healthcare.
#aihealthcare #bristol @BristolHealthP

Richard Welpton
@rwelpton
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Lesson I've taken from Ben Goldacre's talk #aihealthcare: we need to be much better at evaluating digital health interventions so that the NHS can make informed choices about which technologies to deploy

Abbie Jones
@abbiejones86
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Artifical Intelligence: overhyped or potentially apololyptic? It's important to be clear about what we are talking about. What can we do, what can't we do, and what are the risks?
@natalie_banner at #AIhealthcare

Melanie Rodrigues
@MelRodrigues01
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"Algorithms are only an opinion expressed in logic & can contain bias.. " @debselsayedd exploring huge challenges & opportunities of #AI #MachineLearning in transforming how we do #healthcare. #Bristol leading the way with lots of activity: #Sphere #BristolIsOpen 2 name a few 💡

***Dr Sophie Taysom** is an independent policy analyst at Keyah Consulting. She has a keen interest in bringing innovation and policy to life, and is passionate about AI in health and care, and the opportunities and challenges it brings. She is a regular writer at Medium.*