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ARTICLE



Circulating blood: a conversation between Stephanie Sodero and Richard Rackham on vital mobilities in the UK

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ABSTRACT

Vital mobilities are goods that impact one's life chances and that cannot be dematerialized. They must circulate externally in order to allow vital bodily circulations. Blood is a compelling and vital mobile material. It circulates impressive distances internally, within the body, and externally through the practices of donation and transfusion.

This interview is organized in three parts. First, we learn about the everyday mobilities entailed in blood between the point of donation and the point of care. Second, we discuss three exceptional events that impacted NHS Blood and Transplant: the Manchester bombing, the London Olympics and the Filton Flood. Finally, we conclude by reflect on how social science might inform a research relationship between academic theorization of vital mobilities, which centres on the question, "How do move things when it really matter?" and the applied work of NHS Blood and Transplant.

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In England, NHS Blood and Transplant – a body of the National Health Service – is responsible for donation and transfusion of blood, as well as tissues, organs, bone marrow and stem cells. Richard Rackham has more than a decade of experience with NHSBT. In addition, he is a member of the Business Continuity Institute and the Emergency Planning Society. In our conversation, we focus on the question, "How does blood circulate?" Blood is a compelling mobile material. It circulates impressive distances both internally, within the body, and externally through the practices of donation and transfusion. Further, blood is a complex and perishable material that is manufactured into different products, each of which needs to be stored at specific temperatures with varying expiry dates.

This interview has three parts. First, we get a sense of the everyday mobilities entailed in blood between the point of donation and the point of care. Second, we discuss exceptional recent events that impacted NHS Blood and Transplant, including the Manchester bombing, the London Olympics and the Filton Flood. Third, we conclude by reflecting on how social science might inform a research relationship between my academic work on vital mobilities (Sodero 2018) – that is, life-saving movement – and the applied work of the NHS Blood and Transplant team.

1. National health service blood and transplant centre – Manchester, UK (March 2018)

SS: Tell me about your work. What are your responsibilities?

RR: I am the Assistant Director of Government and Resilience. The job splits largely into two. I have governance responsibilities for my directorate, which involves things like risk management, a little bit of clinical governance, issues around health and safety, and information governance. But, by far, the majority of my job is around business continuity and resilience within NHS Blood and Transplant.

SS: What key questions drive your work? What are you thinking about on a day-to-day basis?

RR: What events and circumstances are going to affect us? What is a proportionate response to that? Who do I work with? And, how do I work with them in order for that to happen? Most of those people are inside the organization. But actually we work, formally or less formally, with people outside the organization as well. So we have relationships across Europe. We have relationships across the UK with the other blood services. We have relationships with hospitals. But most of the work that we do is making sure that, internally, we are ready.

SS: What grips you about blood mobilities? How did this topic first capture your imagination?

RR: One of the things that we are very aware of is that people tend to not think about movement. The point where that came home to me, in relation to blood, was in the lead up to the Olympic Games. It was when we were trying to set up the import of blood from Holland as a back-up provision. The complexity of moving blood 50 miles was huge. We did not have a vehicle, because we did not normally run that route. There was a whole load of stuff about importing biological products across an international border, and from one regulatory authority to another. The blood pack looked different. The label was different. The language was different. All we are doing is moving 50 miles.

SS: A key question that drives my work is, "How do we move things when it really matters?" Informed by geographer Pete Adey's (2016) work on emergency mobilities, I am interested in vital mobilities. I describe these as goods that impact one's life chances and that cannot be dematerialized. Blood is a quintessential vital mobility. But before I got into this topic, I never thought about what happened to blood after I made a donation. How does mobility factor into your work?

RR: What we are concerned about in business continuity is the end product being with the person that requires it. We only care about what happens before that point if it prevents that point from happening. That actually can turn out to be quite a long chain. Like most modern supply chains, it is much more complex than people might think.

In the course of one day, you have the transport of staff and equipment to a donor session, transport of blood from either a fixed or mobile donor session to a stock holding unit, and then potentially either the transfer of whole blood and samples to a site with manufacturing and testing, or the split of those, so that the whole blood goes to one place and the samples go somewhere else, because not

all three UK manufacturing sites have a testing site. That is already a lot of travel, and we have not manufactured anything yet.

The following day, we separate the whole blood into plasma, red cells, platelets and other products. We also have sample results. Thankfully, these can be virtualised. So we are now down to our blood unit, which gets validated. In other words, the sample results get matched up with that unit. And when that happens, a nice pretty label comes out and then it is ready for a stock holding unit.

These products need to be kept at very specific temperatures. Red cells need to be refrigerated at 4°C. Platelets need to be at room temperature at 20°C. Plasma needs to be frozen at -25°C. We need to move these products to stock holding units in a way that maintains their temperature integrity and ensures that they get to the right place and can be unpacked at the appropriate time and then put into issuable stock.

Now this is the point, from a business continuity perspective, that we believe we are resilient. We have always said that our resilience is in stock. It is no good if the blood is validated at a manufacturing site if it is needed 300 miles away, because then the journey time is too long. It has to be available at the relevant stock holding unit for issue to a hospital for it to help us with our resilience. That is the bit, for us, where our business continuity or resilience really starts.

From there, sealed boxes containing product are taken to hospital by van. A van might deliver five, six, seven hospitals in one run, if it is routine. When we move into an emergency operation, all of that is exactly the same except that the van displays blue lights and sirens, and gets it there in the shortest possible time that we can manage.

- SS:** Sociologist Henri Lefebvre (2013) introduced the term “rhythmanalysis” to describe the varied rhythms that constitute urban life. Internally, our hearts have a rhythm. What rhythms are involved in blood supply chains?
- RR:** Blood follows a pattern. There is the daily supply chain pattern: the donors come along, blood gets transported overnight, and so on. There is a weekly rhythm that impacts enormously on us. We tend to work a Monday to Friday week. It is the combination of the fact that a week lasts for seven days and so does a platelet. And therefore, because they are in lockstep, you do not get flow over of stock. There is also an annual rhythm. During summer holidays, we end up with a bit of a dip in donations, but that is okay because it coincides with surgeons and others having time off. So activity drops and that is fine; they flow together. Where it really does not work is Christmas and Easter, where donations dip but activity does not.

2. Manchester bombing 2017

- SS:** Urban scholar Stephen Graham (2010) writes about the experience and impacts of infrastructure disruption and failure. In your role you have dealt with diverse disruptions. Most recently, in May 2017, Manchester suffered a mass casualty event when an Ariana Grande concert was bombed. The result was 23 deaths

and more than 500 injured. I understand the response to terrorist events requires specific blood protocols.

RR: We know from previous experience that there is an overall drain of red cells. Because, one, it is the traditional blood replacement. But people tend to overestimate the need. First, they do not know how many casualties are coming. Second, the person who is actually ordering the blood has no idea what is happening in A&E [Accident & Emergency]. They are trying to gauge the panic at the other end of a telephone. Third, people are coming in covered in blood. Things look bad, so you prepare for the worst. That tends to result, in most instances, in a three-fold over order.

In addition, you have got to remember that blood comes in groups. For red blood cells, O Negative works for just about everybody, so there is a tendency to over order that group. However, the biological reality is that only 8 to 10 per cent of the donor population are O Negative. Even under normal circumstances, 12 to 14 per cent of the product issued is O Negative, so already that group is under pressure. In an emergency, that pressure goes up.

In Manchester, the people affected were largely women and children, because it was mums picking up their young children from this concert. Many of the children were girls. You cannot give girls rhesus positive blood because it could compromise a future pregnancy. If you are going to treat people you do not want to ruin other life chances, including the child's future chance to be a mother. For Manchester, because there was this additional pressure, instead of over ordering three-fold, O negative blood was over ordered between five- and six-fold. I think 130–150 units of O Negative blood went out the door.

3. London Olympics 2012

SS: In *Transfusion Medicine*, you and your colleagues write about the experience of planning blood provision for the 2012 Olympics Games (Glasgow et al. 2014). Tell me about what was involved in maintaining stock and circulation during this massive event.

RR: There were two concerns. One was that there would be an incident. And then there was the day-to-day impact on our business. The first part was essentially to talk about how we were going to respond if there were a big incident. We were given some planning assumptions, and we used the numbers in those assumptions to build a stock that was commensurate with an incident that involved many people. We were given several scenarios: terrorist attack, fire and food poisoning. But in essence, the bit around emergency planning, was largely about building stock.

We were also looking at the potential for traffic to become very, very bad, particularly in the East End of London. One of the decisions that we made quickly was that we were not going to collect blood in the East End during that time. That meant that we were going to collect elsewhere because what we needed to do was maintain this stockpile of blood, so we collected outside of London. The other impact was whether we were going to be able to deliver blood. We use validated cold boxes, so we need to understand the period that a journey will take to

determine if that box will retain its temperature. During very heavy traffic, we thought we might be stuck in traffic jams. So, we decided to deliver blood overnight.

SS: Were there any unanticipated impacts?

RR: What we had not really dealt with was that there is an issue of population demographics. A lot of black people live in the East End of London. That is where the majority of our black donors come from. Long story short, people with African and Caribbean heritage, amongst others, are more likely to carry a particular blood subtype of rhesus antigens called Ro. This subtype is frequently used by individuals with particular conditions, like sickle cell anaemia. When we shut down collection in the East End, we did a lot of work to maintain Ro delivery across the country. Now because most of the rest of the country does not have as large a black population, the number of Ro donors was relatively small, but collectively we were hoping it would make a difference. And it did. We enormously increased the amount of Ro blood available for these patients.

4. Filton floods 2012

SS: In September 2012, the largest blood manufacturing centre in the United Kingdom – and in fact Europe – flooded, requiring the redistribution of thousands of blood products to other sites (Morgan et al. 2015). In brief, what is the importance of such a manufacturing centre?

RR: About 50 per cent of England's blood goes through that centre. Around 65 per cent of testing goes through that centre. There are a number of single points of failure as well. For example, it is the home of the British Bone Marrow Registry. It is where all of our cord blood is kept. It is where the International Blood Group Reference Laboratory sits. Pretty much every element of our organization, other than organs, is affected if that site is unavailable.

SS: I understand 12,000 blood products were evacuated in about six hours. What is involved in such a large-scale mobilization?

RR: This was unprecedented. We had no centre before this that was even close to this size. So, this was outside of the organization's practical experience. Having said that, one of the advantages that we had is that Filton does not actually serve many hospitals. Only about nine. So most of the traffic that goes through Filton is actually to move blood from its manufacturing site to other stock holding units. So, they packed up blood to go to other stock holding units. There was a reprovisioning plan: 'provision at this site has gone down, we need to provision from a different site'. But there were one or two consolidations that happened in the previous couple of months, and that reprovisioning plan had not kept pace. So some of this was done using the basis of that reprovisioning plan, but some of it had to be done on the fly.

The other centres not only had to accept the blood that was being moved, but also the manufacturing workload. And then – and these are the things that people forget – it also had to accept the blood that donor teams were bringing to site. For some of our sites that was a significant change, because we had lost the testing

site and we had lost the manufacturing site, as well as losing a stock holding unit. All of that work had to be redistributed. In the end, we did not lose a single unit of blood, but we did lose quite a lot of consumables like testing kits.

SS: Mobilities scholar Mimi Sheller (2013) uses the term “islanding” to describe the stranding or isolation of populations in the context of disaster. Does this concept resonate?

RR: What you are aiming for is that – should any disaster hit within a reasonable scope – your customers do not notice that you had a problem. The way we achieve that is to put services reasonably close to people, and then we deal with the fallout of that internally. So we move blood internally, making sure that the blood is at a place relatively close to a hospital to reduce that final transport time between order and requirement. We have 15 stock holding units that provide hospitals with what they need. We try to keep those units no more than two hours away from any hospital in the country.

We have had situations where bits of the organization have been cut off for various reasons. In terms of transport or siting, there is a hospital in Barrow-in-Furness [in the North West] that, because of the way the land lies, is not an accessible place. We maintain the Lancaster Blood Centre almost entirely to ensure that it is not an isolated centre – or “blood islanded.”

In terms of a communication, we had our network replaced by Vodafone at one point. They did it site by site, starting with the oldest sites first. That left us, at one point, with Filton (the newest site) being the only one on the old network. At this point a digger cut through a cable that was not near any of our centres. That enormously confused the entire network, except for Filton, which was still on the old network. So Filton kept on running, but everywhere else went down. Filton ended up doing a load of things, like validation, by distance.

SS: Sociologist Beck (1992) concludes that contemporary, human-made risks, such as climate change, exceed rational assessment. What is your take on anticipating risk?

RR: From a business continuity point of view, although we look very carefully at risk we do not actually plan for any risk at all. We plan for impact. And so, for example, with Filton, we have not planned for a flood. We are not planning for a fire. We are not planning for power failure. Instead, we plan to lose the building. And what are we going to do when that happens? Fundamentally, what we do is we pack everything in a box and we take it somewhere else.

In business continuity, although we are interested in risk, it is a way of getting us to what the impacts are. So it actually annoys me that we have a pandemic flu plan. We have to have one. I do not like having one, because as far as I am concerned I do not care if people have pandemic flu, because it could be small pox or it could be blue monkey fever. What are we going to do when there is lots of illness about? What the illness is, is not relevant. And even then, I would not necessarily say I am that concerned about illness. The question really is, what happens when we run out of donors? What happens when our staff cannot turn up? If our staff cannot turn up, it does not matter if it is because they are ill or they are caring for other people. They might have won the lottery. It might be a really good news story, but I still have not got

any staff. We need to look at what the basic impacts are. Your theoretician, I think, is quite right.

SS: What were your thoughts when I, as a social scientist interested in vital mobilities, sent you an email suggesting collaboration?

RR: I suppose my initial reaction was, “Has this come to the right person?” We have not had a history of being contacted by academics. But it makes sense for two reasons. One, getting the faces of my team out there to talk about our work is important. Two, we work in an organization where academic credibility is essential.

I am a scientist. I worked in blood for 15 years at the lab bench before I worked here. I think about blood as this is it: bish, bash, bosh. However, there was an element in me that went “Actually, that should be quite interesting,” because I have never thought about working with social scientists before. Also, your request happened to come at a point where there was particular consideration about matters that had not occurred to me before. How do people interact with our organization in an emergency, like Manchester? I realized that there is a social aspect to our work. People are not working entirely on a laboratory bench basis; the public interacts with us emotionally.

SS: What do you hope or envision social science might bring to your work?

RR: This is simple stuff like, for example, who is supposed to tell us when an emergency happens? Theoretically, it is supposed to be NHS England. I do not think NHS England have ever told us about an incident. We find out from other, often unexpected, means. In the case of the Manchester bombing, the phone call came from the Duty Hospital Services Manager, who was notified because the person at the Liverpool site happened to be watching Sky News and phoned saying, “There is something on the telly you ought to see. I think we have a major incident going on.” The point is to understand that some of these interactions, such as the reaction of the general public. I recently heard a news clip about the Bataclan attack: “The people of Paris did not want to lie down. In fact, the following day they queued up to give blood.” Yeah, that is what people do. And then I suddenly thought, hang on, maybe it is not what people *think* people do. After Manchester, we had that problem here: we had more blood donors than capacity. I think we need to learn how to harness some of that information. We need to stop dealing with people as banks of blood and patients, hoping that they will do what we tell them. We need to have a deeper understanding so that we behave differently, so that we are more open. I know that is not a particularly lofty ambition, but I think it is so far away from where we are now that it would be a helpful place to aim for.

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