NTDS_41_1

Key:

I: Interviewer
R: Respondent

I: Okay, so to start with do you want to quickly introduce yourself and your background and how you got involved into MEDMI and then we move on to talking about the expectations of MEDMI and the trajectory you have now.

R: Okay. Yes. So I'm Shakoor Hajat. I'm a senior lecturer at the London School of Hygiene and Tropical Medicine. I have a background in epidemiology, more specifically environmental epidemiology. So my research career has exclusively been about assessing environmental health impacts, specifically air pollution and more recently climate variability, and also climate change impacts on public health. That's primarily how I got involved with MEDMI, which is, as you know, an initiative to bring together health, environmental, social datasets to be able to assess associations more rigorously using data that hasn't previously been linked. So my involvement is initially about using some of the work we do to demonstrate how data could be combined and how new hypotheses could be tested, using the resources that MEDMI is looking to provide.

So initially the idea was that certainly by the end of the project that we would have many databases of MEDMI, which researchers, such as myself would be able to access with appropriate safeguards, and be able to link with environmental exposures. That hasn't been forthcoming so far, because we've had some limitations about getting approval to use health data. So while my colleagues at Public Health England have been making plans to get access to mortality data, and that's now been provided, we've got permission to provide mortality data on the MEDMI platform. As you know, this is quite far into the project now. We're approaching the end of the project, and so most of the work I've done has not really been via the MEDMI platform, but it's rather to conduct health, environmental studies, similar to what I've done in the past, just to demonstrate how data can be used and how potentially these kind of studies could be improved if we have access to more data with better linkages.

I: Initially the idea was that MEDMI platform would have played a stronger role into enabling your work?

R: Yes. That was really the goal of the project. I think it still could be that at some stage, but I think there has been difficulties getting health data primarily and trying to get permission to put data on a platform. Obviously that kind of triggers alarm bells for data providers, quite rightly because they're very concerned about confidentiality and so on. So it's kind of a slow process, I think, trying to get permissions. We were hoping that Public Health England to some extent would be able to bypass some of these restrictions because of what they do; they have a unique access to data, so they can access health data that researchers wouldn't be able to do in the same way. So, in the past, as researchers, when we've wanted to use data such as say mortality, we've made an application to the Office for National Statistics and then request the

fields that we want, and if we want data at a fine spatial resolution then there are additional considerations that they have.

So the whole process can take quite long, probably 12 months between making an application and receiving the data.

I: This is ONS?

R: Yes, this is if we go through the ONS. Public Health England also have access to that data. It comes via the ONS, but I think they receive it on a regular basis. So the approvals are already in-built, so hopefully they can short circuit some of the obstacles that we would have as researchers. Because Public Health England has gone through a bit of a reshuffle recently, so I think there were complications again about who has access to the data, who should be approached to get access. On a different project, we have a PhD student who has a joint position between the London School and Public Health England. She's using mortality data for her PhD. So she's obtained that through Public Health England. When she began, about two years ago, she made the request. At that time it just wasn't very obvious who should be approached, or what the mechanism was for requesting data. It's all been obtained now, but again it took quite a long time.

I: So then what was the process for you to discover? Was that pinging people and see what they point to?

R: Yes. The student is fortunate in that she has co-supervisors at Public Health England as well. So they were able to give her specific names, so, 'Contact this person. Contact that person.' Sometimes that didn't lead anywhere, and then contacted somebody else, so it was a bit of a trial and error process, but eventually, because she persisted, she now has the data. It wasn't a very transparent process for her. Maybe it's different now. I think because it was very early in the new structure of Public Health England, I think that's why maybe she had problems. Maybe it's an easier process now.

I: For MEDMI I understand a factor was also that MEDMI was intended to make the data available, so host them.

R: Yes.

I: So for the student it's perhaps easier because I assume that maybe she needs the data for her own research.

R: Yes, exactly that. It's for her own research, and when she made the application and certainly when we make applications through ONS, as part of the application we name all the individuals that will have access to the original data. We have to give provisions that the data will be stored on a secure server here. Thankfully we have all that in place. So once we've made the application, even though it can be a long process, there's usually not a complication in that they don't query anything about our security here. We do need to specify the specific projects that the data will be used for, and the individuals that will have access to the data. So, yes, you're right, with MEDMI, because there was this additional intention to make the data available to researchers, that I think is not something that I'd encountered before, and so there was always going to be considerations which I think we've still not fully resolved.

One thing is that MEDMI... because the data effectively would be on a platform, which anybody could access, any researcher anywhere in the world could access, there's questions about, 'Okay, well these data are provided by effectively British tax payers' money, so should that data be available just for people in the UK? But if it's on the internet then effectively it's available to everybody.' So these kind of considerations that we've never really had in the past because we've always requested data for very specific defined projects and for named people.

I: So these kind of other layers, did it emerge more after the first steps, first access it for myself and then access it for the others, or was that altogether when you started talking about data and stuff, this was..?

R: Well, my perception is a lot of this was discussed once the project started, and maybe a lot of this could have been established before the project started. I wasn't heavily involved in the initial development of the project. So I'm not fully sure about to what extent this was discussed beforehand. [redacted] From my point of view, it hasn't restricted me because for me it was very clear from quite early on that what I would be doing would be still very similar to what I've done in the past, which is working on very defined projects using datasets that I already have access to, so it hasn't really been a case of using the platform or waiting until the platform can make the data available, because for my purposes it's just easier to access the health data, the exposure data directly, and analyse it that way.

9I think it's fair to say that I can do that because the kind of studies that I'm traditionally doing are quite reductive. They generally will have one health outcome, one exposure, maybe a few confounders, but we're maybe not looking at how datasets could be used in a more combined way. So if I was a researcher doing more expansive studies that required thinking about more general linkages then I probably couldn't do what I do without having access to what the platform hopefully will be able to provide.

I: Right, the platform then would become necessary?

R: Yes, exactly. I think it's a big 'if' still, because at this stage what's available on the platform I think there's no additional advantage of using the platform to do analysis or to get the data, because it's still not as expansive as the intention was or hopefully will be at some stage.

I: So there was initially the expectation was of using the platform to do more expansive research?

R: Yes. Even if it doesn't happen under MEDMI, as you know there might be a MEDMI 2, or there are other projects which the MEDMI platform could be utilised for. So I think the potential is still there.

I: Also I've learnt that in the sense of for example the project one that you were involved in, you could continue in terms of research goals because you had access to some of the data from before.

R: Yes.

I: As you said, you could use the tools that you normally use.

R: Absolutely, yes. Pretty much everything I've done on demonstration project one hasn't been dependent on what's on the platform. The exposure data generally, even though there's a lot of exposure data on the platform now, most of that is in the public domain, it's available anyway for researchers. So we've always used a website developed by NERC, the BADC website, The British Atmospheric Data Centre. So they have a lot of environmental weather factors, a lot of other environmental exposures. Much of it comes via the Met Office, but that data's already on a website and freely available to download. From the health perspective, because generally we are doing time series studies more than any other kind of studies, where we're collapsing the data, we're aggregating it to a daily count, so we're not using individual level information anymore. So there have never been too many problems using data for that.

Most common example would be we'd be analysing say daily fluctuations in temperature and daily mortality in London, or another government region. So it's a very broad aggregation. We don't do much in the way of spatial analysis. So we don't really need much information about postcodes of patients and so on. If we did that kind of analysis then I would think there are additional complications, and that's where MEDMI really could maybe be more useful for us, because they might have already put the safeguards in place where they can make this data available. I think we're still having that discussion in that. I'm not quite sure what ONS have promised to provide on the MEDMI platform, but I'd be surprised if they're allowing full postcode information to be made available on the platform. I don't think that would be the case.

I: So it would have to be masked maybe or anonymised in some way.

R: Exactly, yes.

I: Trying to recall the timeline of the project, at what point did you start changing your expectation and trying to see, 'Okay, we can now (ph 0.17.56) *de-couple* say the development of the infrastructure and the website from the demo project, so that I can go on the research and the demo project with what I have and that will develop the associated work on the platform on two parallel tracks'?

R: Quite early on, I think, because once the project started it was clear that for a lot of the health data we were starting from the beginning, where it was still the case that we hadn't approached data providers, or had the discussions with data providers, and just from my own experience I knew that if we are starting from that position, if you make an application, even if everything goes through fine, it will still be the best part of 12 months before you might actually get the data. That's if everything is straightforward. So I knew fairly early on that for my purposes I probably wouldn't be using the platform. Initially we spent quite a bit of time on developing a web browser as well as part of the MEDMI platform, which does some of the analysis, which calls in some of the data that is on the platform, and does the analysis. A colleague of mine, Kerry, I don't know if you've spoken with him?

I: Yes.

R: He's been leading on developing that. What he's managed to produce is really good because it's able to do the kind of analysis that previously you may have needed to do in more dedicated statistical packages. It was a lot of Kerry's time and a lot of his programming skills to get that stage, and it's only one kind of analysis. We were hoping that we could put in different types of study designs, and so when all these data are potentially going to be made available on the platform, you'll likely need different kind of methodological approaches to analyse them, because you might be doing something that's more spatial rather than temporal. At this stage, the only kind of study design we have is a time series study, which is just looking at temporal variations. So if we wanted to look at linkages on a spatial scale, then we can't do that on the browser. We're not going to get to a stage where we can do that under MEDMI 1, because it just takes a lot of time to develop that.

I: In this case, in respect to the functionalities that will constitute the final form of the web application and stuff, what factors shaped the kind of features, what in the end the infrastructure will be capable of doing?

R: Well, there were a lot of factors that guided us when we were developing the browser. Certain factors, such as we wanted to be able to make it the browser could be expanded by other users, so if we made it transparent enough and flexible enough anybody with programming skills could add additional features. I think that is a strength of it.

I: By writing or pasting a piece of code into a browser?

R: Yes, exactly. We used Python code to run these analyses, and Python's freely available, so anybody could write additional Python code and add to it. So that I think could potentially be a useful feature of it. We were restricted in what we could do because we weren't sure what kind of data we might have. So we developed the browser using an example dataset, just a dataset that we'd used previously and we'd already published results on. This was just looking at daily time series data, so again it was daily mortality in London, daily temperature in London over a number of years. So we developed the browser to analyse that. If say somebody wanted to look at spatial linkages, then there's nothing that... you couldn't really build on what's there, you would be starting completely again from scratch and developing another set of programmes to do that.

I: Do you think it would have been possible to... if you had all the datasets in place at the start, to have also other features or other models? You said, 'We were restricted in what we could do because we were working with data that has got certain features.'

R: Yes. I mean potentially. Kerry might be able to comment better on that, but I think as a programmer he might have been able to see ways in which the programme could have been sufficiently flexible to be able to adapt so that we could incorporate different kind of study designs and build on what's already there, rather than having kind of working just in one direction. Then if wanted to add another kind of study design we'd just kind of have to start from the beginning again once we've got that data and we can see what we can do with it. I think if we had a lot of that data from the beginning maybe we could just see how we could have made the programme sufficiently flexible so that

we could add those additional kind of study designs without having to go right back to the beginning, if we could just amend what was already there.
So I think it would have been more efficient to do that, but maybe I'm being naive. Maybe a programmer might tell you that it still would have been difficult to do that. That's what I was hoping that we could get to a stage where the script could be amended by anyone, effectively, and develop different kind of study designs once some kind of core script is already in place.

I: So as you were developing this application, were there specific points in the development of features or designs where you actually thought, 'Okay, let's see actually what is the status of the situation is with regards to accessing the data so that we can do something like this, or something like that,' and then you said, 'Okay, it's not ready, so let's continue with this,' and stuff.

R: That's a good point. From my perspective there probably wasn't that much in the way of consideration because the way that Kerry and I were working, we would get together occasionally. I would do the analysis I usually do using Stata, using a different statistical package. Then Kerry would try to replicate that using Python code, which he can then convert into what the browser can convey. So my focus was on just seeing how well we could translate what I can do in Stata into the browser. We did that quite successfully in that we were able to reproduce the analysis and reproduce the results that we could do in Stata, but Kerry probably had other considerations, such as... In Stata, the data would have just been in a spreadsheet form where we've got all the variables just in one data file.

Whereas Kerry would be thinking that for future if we do ultimately want to look at how different datasets could be linked together, we need to keep all these variables separate, we can't just have them all in an individual dataset, because you're then restricted to just analysing the ones that there are, whereas if each variable is in an individual file, then potentially if more and more files are introduced then they could still be combined. So I think Kerry had those kind of considerations as we were developing. From my perspective, it wasn't something that I was kind of focusing on.

I: In terms of continuity, there was also this... I think at least from the manager's perspective this kind of problem at some point that Kerry left and then it was not possible to hire an appropriate substitution, so then he came back as a consultant and stuff. Did this impact the work on the project that you were overseeing? Did it make things more difficult to follow up?

R: Yes. I think it did make things more difficult, just from the perspective of Kerry's time on it was limited. He was pretty much leading on it in that he was familiar with Python code, which I wasn't at the start. He was developing the interface for the browser. He had to have a certain level of statistical knowledge because the statistical models I was doing in Stata, we were then trying to see how well these could be done in Python. So he had to be quite familiar quite quickly with running statistical models as well. So he had all those skills, and so when he left it would be very difficult to find somebody with all of those skills. If we could have found someone then maybe we may have been able to get further than we have with the browser. We were lucky that Kerry was still involved, so he was still able to work on it, and we got to a stage where the browser is finalised up to a point where it will do an analysis.

It's not as flexible as I hoped right at the beginning, but that was just because of practicalities, where once we lost Kerry's time it was going to be difficult.

I: I think that some of the skills that were important that Kerry had, as you seem to say, were the skills that he developed in the project. Is that correct?

R: Yes.

I: Like modelling statistical analysis in Python, there's probably not very many certifications to be involved in that kind of project.

R: Yes, absolutely. It would have been difficult to find that all in one package. Kerry I think is a very quick learner, so he was able to get to a stage where he could deal with that, and if he had any queries then he was asking me, but that worked quite effectively because he had enough knowledge to be able to do quite a lot of it, and then if he had individual queries then he would just email me and I'd hopefully be able to resolve it, and he'd be able to carry on. So, yes, the fact that he didn't have that from the beginning could potentially have been a problem, but because he picked it up very quickly I think it didn't turn out to be a very limiting factor.

I: Now as the project approaches its end, what kind of aims and hopes do you have for its legacy and its future, of the data that is available there, of the tools of the browser and stuff? Do you plan to use them, or do you hope people will use them?

R: I'm pessimistic. I think the browser is very good at doing one thing right now, but if we wanted it to be able to do more, different kinds of analysis on data at different resolutions, whether that's spatial or temporal, it would be a case of having somebody like Kerry developing all that again. It's not at a stage where what's there right now could be adapted to make it more flexible. So it is limited.

I: So to be extendable it would have to be re-built?

R: I think so. If that was a priority for MEDMI, then it would be a case of re-building, but I think what's there right now could be potentially useful as a teaching tool, because when we developed the browser we always had in mind that it may not... we were hoping that researchers will use it, but it would also be useful for people in government, stakeholders, people who may not be familiar with doing analysis, and familiar with the underlying epidemiological methods that are used, but we provide enough information and we make certain assumptions about the model which the end user, if they're not particular familiar with they don't need to worry about. So we kind of designed it so that people who are not experienced doing these kind of studies could still use it, hopefully.

Then there is always a danger that there might be... if at some stage we did get to a point where we've got all these datasets, and people could link datasets and find a correlation, as epidemiologists we're always wary of the fact that you might see a correlation between two variables, but that doesn't exactly mean it's causation. So people might find spurious associations and link this with that, whereas if they're more familiar with the methods and they

do a more robust analysis, then they might find that there's no link at all. So there was always that danger.

I: So in some way then the application wraps things up nicely for initial step. Then doesn't help you to further your analysis stuff?

R: Yes, that's right.

(End of recording)

NTDS_41_2

R: Health protection research unit, which the University of Exeter are partners of as well. So this is a five-year project on environmental change and health. So this is one of the kind of projects where MEDMI potentially could have fed-into, if there'd been more data on MEDMI and more flexibility with the browser, then these activities on the HPRU potentially could have been used. In fact, the MEDMI might have been referred to when the application was written, when the proposal was written for HPRU. I think because it was important to show added value, and so we were saying that, 'Yes, we could build on the kind of activities that MEDMI are doing.'

I: Of course, yes. So you were saying it can be useful as a teaching tool, obviously then if one finds the correlation then you would need to step back and use other tools to...

R: Yes, exactly. So it would be very important to flag up for non-experienced users that, 'Okay, you might see that there's a peak in asthma as the same time as there's a peak in pollen, but that just might be coincidental, so you have to use more rigorous methods to look at associations more robustly,' and so, yes, then you'd kind of flag it up and then maybe direct them towards, 'Okay, you could do this kind of analysis to try to make sure that the association you've found is likely to be a causal one.' I don't think we got to that kind of stage, so at the moment I think it's useful as a teaching tool to teach one kind of study design. That's all really.

I: Do you think you might use it, or it's not maybe of interest for your students?

R: Potentially not for our students, because we're a postgraduate teaching institute, and all the students, if they're taking analytical modules, because all of them use Stata here, it just makes sense for the students to use Stata when they're doing environmental health analysis as well.

I: They are advanced already.

R: Yes, exactly, they are at a fairly advanced level. If somebody was interested in using it without any kind of knowledge at all, then I think potentially it could be useful.

I: Beyond the browser application, at more at the infrastructure level, what do you think could be necessary or it's important to keep in mind to give MEDMI a legacy or a future?

R: Well, more health data. I think that's really what it boils down to. Christophe did a great job getting so much environmental data there, which is great, but it's only useful if we can link it to health data. At the moment we've got this mortality dataset that are used for the browser, and asthma hospital admissions, but that's very defined small datasets. We need other data to I think make MEDMI useful and to have some kind of legacy. There is potential, because under demonstration project one I'm currently doing an analysis looking at GP consultations, and linking that to environmental temperature, so looking to see whether there's an increased risk of a consultation among diabetics on a hot day. It's been interesting because as you'd have had experience with SAIL, so there are issues regarding confidentiality. These are patients on GP databases, so we're very careful about making sure that they're not identifiable.

So what we were doing for this analysis was we were linking the consultations to the Met Office dataset that Christophe provided, which is a gridded dataset of temperature conditions for the whole of the UK on a five kilometre by five kilometre grid. So that's fairly small, so if you're then linking that to a patient from this TPP database, there is potential for that person to be identifiable. So what the data providers insisted is that they did the linkage in-house. So they were provided with the Met Office gridded dataset, and then they linked it to their patients, the postcode of residence of their patients. Then they provided me with the linked information but with all the patient information removed, so we don't know where that specific route point is. I don't need to know where that route point is because I'm just interested in whether there's an association within that route point. Just one more thing on that, this was ResearchOne who provided TPP dataset.

I: TPP is the organisation that did the data linkage?

R: Well, ResearchOne is the organisation. They did the data linkage and the actual dataset that I'm using, the GP one, is called TPP.

I: TPP is the GP database?

R: Yes.

I: ResearchOne is..?

R: The organisation that provides the dataset.

I: The TPP datasets?

R: Yes. They did the linkage. They're aware, because they've been to one of the MEDMI meetings previously, so they're aware that at some point we want to have health data on a platform. They haven't ruled that out. This is not being done with a view to making that data available, but they're open to having that discussion if we find that this analysis is useful. So I think if we can demonstrate that there's virtue in using their data in this way then I think they're more amenable to making some of their data available. Again, those discussions would need to be had about what kind of data could be provided.

I: So they would need to carry on also after the formal end of the project?

R: Yes. Realistically it's not going to happen within the time that we've got left on MEDMI.

I: Potentially then this could become part of the datasets?

R: Yes. If there was scope to do more work, then we could do the same thing with other kinds of data providers and show how their data could be used, without compromising confidentiality. There's potential to have other kind of datasets as well. I think it would be very hard for somebody to agree to do that without them seeing the virtues of the platform and what kind of useful research could be done on it.

I: So in terms of partners, I guess it is important to have partners that are capable of doing this kind of operations, like ResearchOne could actually do the linkage for you.

R: Yes. We could have done the linkage ourselves, but they wanted to do it. I would imagine that's the case with most data providers where they're probably used to linking datasets in-house and then providing anonymised datasets. So I think that kind of model could work in a lot of cases.

I: To the topic that you opened before we started recording earlier, would you like to explain to me a little bit more about that, how you think it's getting a bit more difficult to access that data? As you said previously it used to be not problematic, or the factors that are making this more difficult.

R: Mainly because of increased safeguards that the data providers have. So in the past for instance we've used hospital admissions data, emergency hospital admissions, which we obtained from the HSCIC, which is the Health and Social Care Information Centre. We've made requests in the past and because we've identified what kind of analysis we're going to do with the data and in most cases we were going to collapse it, so we were looking at the daily number of admissions for a government region. That was sufficiently broad for there not to be any kind of confidentiality issues, but I think even now they have stricter safeguards where even when the data is anonymised like that, there might still be restrictions about whether that data can actually be shared or used by people that weren't named on the original proposal. So that's kind of one example, and I think it's driven by concerns about data safeguard. So I would imagine that it's the case with requesting data from other sources as well. I'm sure ONS now as well have stricter safeguards.

I: Is this also related in maybe you are also trying to do research about smaller groups, or is it not? Like there is the potential to still do populational logic but at very small groups that then have got the problem like you were saying, identifying a diabetic in five kilometres.

R: There's a lot of virtue in trying to do analysis where the groups are fairly well-defined, because you want to be able to identify very vulnerable individuals that you might target interventions towards. That hasn't been a driving factor for our work, just because of the nature of the work we do, we are usually looking at quite broad groups. So it might be deaths from all cardiovascular diseases, or deaths from all respiratory diseases, and that's mainly because we know that the kind of exposures that we're interested in; temperature, air pollution, they can have impacts on deaths from many different kinds of

causes. I would imagine that if there are researchers doing different kind of work where you're looking at very defined associations between a very clear disease and a very clear exposure, then you're going to be limited now. I think it would be increasingly limited.

Actually, yes, it's a good point you raised about the TPP data, because when we initially made the request we wanted to look at diabetic patients but we also wanted to look at patients with Parkinson's disease. When the proposal went through their review process, they felt that because Parkinson's disease is quite rare, there is still potential for these patients to be identified. So they declined doing that component. So that's why we're looking at diabetic patients, but we're not looking at Parkinson's disease patients for that reason. For our purposes that's okay because this is really just a demonstration project, so we want to be able to just demonstrate the fullness of the data. If we did really want to find associations between patients with Parkinson's disease and temperature then we couldn't have done it.

I: So there could be this trend in the epidemiology of... the opportunity of looking into smaller groups, and that then can clash.

R: Yes, absolutely. I think for researchers that do that kind of work then it's likely to get increasingly difficult.

I: I think this is an interesting point of reflection, in the sense with these big data systems, there's a lot of expectation and hope for I think public health in general to get more granular and to detect smaller or more (unclear 0.15.02) links.

R: Yes.

I: So then moving into smaller groups to characterise stronger relationships, right? This could actually have to come to terms with then conventions and regulations.

R: Yes, exactly. Big data has a lot to offer, like you say. We can look at associations on a level that previously haven't been, but I'm not very experienced about using datasets in this way, because traditionally what we've done is very traditional epidemiologist reductionist work. That's not the way the real world works. Something like climate change, there's multiple pathways, there are many processes through which it could affect public health, and that might involve other sectors as well, such as agriculture, transport and so on. So if you want to be able to try to look at these kind of patterns, then big data is necessary, linking all these previously unlinked datasets, but yes, I think we are going to run up against issues about, 'Okay, if you're starting to link all these datasets and the overlap between them is quite small, then you're potentially identifying people.' It's been a problem for MEDMI. I think it's been a problem for other kind of initiatives that are similar.

If we can demonstrate how this is useful for public health, why the research needs to be done, then I'm sure that there's ways around this and safeguards can be put in place.

I: Great. Is there any sort of topic or point that you thought during the interview, 'I'm going to touch on that later'? I think we are slightly over

time. It's been extremely helpful as well. I've touched on the various topics and stuff that I wanted to discuss.

R: Just one thing that came to mind is that... just based on the discussions we've had, the questions you've asked, it's probably made me realise something from my experience on MEDMI, in that the project probably wasn't playing to my strengths, because I'm an epidemiologist with a statistical background whose research experience is very much on analysing very defined datasets, looking at very simple associations. I mean simple in the sense that generally looking at only one exposure and one outcome. MEDMI is all about the bigger picture and how processes might be working on a larger scale. The kind of technologies that we need to be able to bring all that information together, it's not something I'm familiar with.

It's not something I don't think a lot of the people on MEDMI are familiar with, because we're quite heavy on the researchers, but there weren't that many resources for people like Kerry and the technologists and the people who know what the limitations are likely to be. Probably ethics as well, we probably weren't primed for knowing beforehand what kind of obstacles we were likely to come across when we would want to develop this platform.

I: It's interesting because you noticed that there was a need to more people with skills like software development, but also the role on ethics or something like that, someone to hold up the flag.

R: Yes. I think so. Especially at the beginning I think it would have been helpful to know what those parameters are. It's a learning process, so we've got to learn from this whole project.

I: Yes. Thanks. This was very useful.

R: No problem. I enjoyed it.

(End of recording)