Int: We probably need to start with some introductions because we have a lot of new faces here. We will go round a quick round of introductions. And then onto the agenda today. We had the session a little while ago now, a couple of months ago where we presented some initial ideas around the ME-NET project, and our stakeholders gave us some excellent feedback. We then went back to our design and development company to ask if we can we make some changes to the project. We looked at some different avenues for taking design and development forward. So I've got quite a bit to present to you today. So the design company gave me multiple options for direction. It is a lot of content. What I will do is present it to you today, and then I might send you a follow up e-mail which will enable you to give some more specific feedback, via a survey, otherwise we'll be here all day. We've got some new content to discuss today as well looking at the content from last time. I said in the e-mail that this is around self-reporting, this is a component of the application. I think we'll start with a little rip around and a brief get to know you. I asked last time what you thought when you thought of methane, you don't need to do that again, unless this is your first time in the group. If you've already told us what you think of methane, you don't need to tell us again but if it's your first time attending one of these sessions. I will ask you to tell us who you are, who you represent, and what you think of when you think of methane; just a couple of sentences each, and we will start with AM? Introduce yourself very briefly, where you from what you represent.

Res1: My name is AMS, assistant director for prevention and early intervention in public health at Lincolnshire County Council.

Int: Thank you, C?

Res2: Morning I am CH, I work for a charity called Everyone, that is around enabling citizens to take part in lots of things including research. In terms of methane, what do I think of? I think of three things, I think of cow’s bottoms! I think of my asthma, and I think of traffic.

Int: Fantastic, thank you. S, I know you are with us last time so if you just want to introduce yourself for people who might not know you?

Res3: Hi, I’m SC, I work with children and young people, programme manager for Lincolnshire integrated care board, and asthma is one of my programmes work.

Int: L?

Res4: Hi, I am L, assistant psychologist in the community mental health team from LPFT.

Int: L?

Res5: Hi I am LD, I am the children's respiratory nurse based in Lincolnshire.

Int: E?

Res6: Hello, I am EH, I am a professor of climate science and metrology in the geography department at the University of Lincoln, and I'm interested in that pollution and I'm really excited to be working with you all on this ME-NET project.

Int: I should mention that E was one of the team who came with us to Welcome Trust, when we went for this award. I think now that we have DH?

Res7: I'm professor of respiratory medicine at the University of Exeter, I have worked with C for many years now. I worked at the Met Offices forecasting group where we worked to develop an early warning app for people with COPD looking at adverse weather conditions and what they could do in the winter to respond to that. I'm also on the board of directors of GOLD which is the global initiative for chronic obstructive lung disease, working very closely with lots of respiratory people in low and middle income countries looking at their respiratory health. C asked me to join the group.

Int: Thank you so much for attending D, as this is your first time with his, this is an application that we are developing for the UK, but also for Ghana, we have a separate stakeholder group, in fact we now have two stakeholder groups for Accra and Sekondi Takoradi. Fantastic to have your input. KH?

Res8: Morning, KH, I am the chief intelligence and analytics Officer for the Lincolnshire health and care system working for the ICB.

Int: S?

Res9: I am a senior lecturer in epidemiology at the Holyoke Medical school. I was invited into this through C, who I worked with when I initially started my training around the area of air pollution and asthma in particular, I remained in that area for quite sometime now. I also have another interest to share here because I am from Ghana, and I do have quite a lot of interest in global health and then exposure studies in low and middle income countries, including my own country Ghana.

Int: It's fantastic to have you with us. C, thank you for inviting everybody.

Res10: I am CS, I'm the senior health research scientist at the Met Office, and I've been working in this area for over 16 years now.

Int: Next on my list is J?

Res11: Hello, I’m JA, and I I'm a senior lecturer in computer science at the university of Lincoln.

Int: J?

Res12: I am JA, I work at the university of Lincoln and I especially supporting the research team, that's why I'm here. I am from Ghana as well.

Int: Fantastic. N?

Res13: I am NR, I'm from the County Council come out but I also lead the Coastal Communities Alliance that fits into the old party parliamentary group on coastal communities. So we're just here to look how we can share this best practice around other coastal communities around the country.

Int: N?

Res14: Good morning, my name is N, and I am a clinical psychologist and also co lead the psychological health and well-being research group at the University of Lincoln.

Int: R?

Res15: Hi I'm R, I'm an associate professor at the university of Lincoln in the School of Creative Arts.

Int: R and D?

Res16: I’m RG, I was here last time so I won't go into the details, but I am a resident in the area.

Int: D?

Res17: I was invited to participate in what they call a police check report 20 years ago today, that report that the residents attended 20 years ago discovered that residents of Park ward hello expected reduced life expectancy of around 20 years compared to people living 4 miles away.

Int: And R that's a big interest inequality. Very pleased So happy here today. R?

Res18: I am RB, I am a public contributor affiliated to the University of Lincoln. Methane, it is cows, but I do worry about them, they seem to get the blame.

Int: They do indeed. G?

Res19: Morning everyone my name is GS, and I'm the research and evaluation manager at East Midlands ambulance service NHS Trust.

Int: And finally, V?

Res20: I wondered why I would be on the list. I am baby, I am part of the sustainability team at Lincolnshire County Council. I have recently run a project to the secondary schools across the country looking at air pollution and their local campaigning and education sharing impact that schoolchildren can make. So I'm coming here to represent young people a little bit as well, but come from a climate change perspective alongside that.

Int: Thank you so much for those introductions. We will move on. This is just a little bit of admin I suppose, I sent around an e-mail little while ago with a little survey, I wanted to explain a bit about why I sent that forward. I sent an e-mail which is capturing completely anonymously what I like to refer to as our positionality. And I asked you to consider how the issues of mental health and respiratory health respiratory impact with your life. And part of the reason that we asked that, we are co developing some design options of reporting, and would like to have an understanding of where everyone is coming from. We don't know who's responding to the survey but we're just looking to capture the different perspectives that we bring. So we've asked for your personal lived experience, what your perspective can bring to this exercise, of making choices or feeding into design elements of the application because your experience gives you a unique perspective. So if you haven't had an urgency to do it yet, there is a link there, and you can use your phone for the QR code or there is a link that you can copy and paste from, and you can do that quite briefly while we're going through these slides. This is a second meeting around the ME-NET application.

<Displays Methan Early Warning Network Slide>

Int: So I thought I'd just start with a very brief refresher of the functions that we are discussing today.

<Displays Main Feature (Refresher) slide>

1. Register a user profile including health conditions, demographic characteristics;
2. Set alerts, up in for push functions, for ozone in your area to receive recommendations for Health Protection;
3. Receive prompts to self-report daily respiratory and mental health outcomes health outcomes including text/visual scales (e.g. Emotion wheels);
4. Advanced option for setting bespoke thresholds for alerts (e.g. If particularly susceptible to us from attacks might lower threshold for Health Protection recommendations.)

<Displays Your Suggestions Slide>

* Education Model: start with simple picture based image we've touch animation guiding user attention to links between health, sources of pollutants and environmental/metallurgical condition - > fed back to CK;
* Outcome: CK will adopt an ‘agile’ approach, users are guided through a simple module with options for ‘find out more’ boxes with backs, and additional links to ‘find even more’ – 3 tiered.
* Self-reporting health and well-being:
* Outcome: we will give users the option of both numeric and picture based reporting, but we need your help to Co design and trial the visual material!

Int: In our first meeting we asked you to identify unintended negative consequences and make suggestions that could enhance our ME-NET platform. You said ‘a picture tells 1000 words’

<Displays Co-Design Following your Feedback slide>

Int: There is a lot, I will send a follow up e-mail to capture your feedback.

<Displays Design sketches>

Int: I mentioned that we went back to our design and development team, and they gave us a lot of content, I'm going to now present that content and please feel free to take any notes. The way I like to think about these things, is to give it a numeric value in your head, on the scale of one to ten, how useful do you think it is. I'm actually going to present two different versions, and after I presented the two versions, I will ask you in the function in Teams, to raise a hand when I say version one or two, so I can get a sense of how many people have a preference for either version because at this point in the design process they need to make a decision about what direction they are going to take this. I have listened to everything you've had to say so far but we still have some design options. So J went away and analysed all of our transcripts from these meetings. I also analysed the themes that came out from the surveys that you did last time about unintended consequences, things that could go wrong, and I then attempted with my very limited arts based skills, I attempted to capture some of your suggestions. <Displays sketches> These are my dodgy little sketches of my interpretation of the recommendations that you guys have made. The top one I have - Here’s my health and how it's impacted processes on the ground. Here are some health recommendations. I gave our design team some examples of what I thought it might be a meaningful representation – Here is person, here is ozone, here is person coughing, here our cars and here are different sources of methane. Here is a health recommendation, consider shutting the window. I actually gave them pages and pages of major scrawling away. Then they went away and came up with some versions of what they thought would be mildly more professional than why have scrawled capturing some of those dynamics.

<Displays Educations Module #1 slide>

Int: This is the first module that they presented to me, and basically do you go down a more illustrative route with a bit more details and features of people, or do you go through a more design route which is a bit more outlines. Something to consider here, and they gave this to me only a few days ago actually, I had a look at all of it and I thought this is pretty western centric imagery. I'm very aware of how eurocentric I suppose some of the imagery is here. Something we need to take our Ghanaian team is what do we need to do to make it more universal? That was an initial observation that I had.

<Displays Air pollution and Health slide>

Int: This is starting with the more illustrative version how it would work in the app is you zoom through, how it would work on the web device would be that you scroll down a page and different images emerge, this is a more static version of that.

<Displays Air Pollution can impact your health and well-being slide>

<Displays Ozone in the air can make it hard to breathe slide>

<Displays Where Ozone it come from? Slide>

<Displays Ozone is produced when sunlight mixes with emissions from factories, cars, houses and agriculture Slide>

<Displays Methane is an important emission that contributes to the formation of ozone in the air that we breathe Slide>

<Displays Methane in the air comes from oil production, indoor cookers, waste processing and cows Slide>

<Displays How can I protect my health? Slide>

< Displays There lots of things you can do to protect your health on days when ozone levels might make it hard to breathe Slide>

<Displays – Close the window, consider later exercise today, exercise lighter in the morning, exercise in the morning rather than the afternoon, use your preventative inhaler today, pack your blue inhaler if you're going out. Slide>

<Displays – Find out More. Slide>

Int: So that is just one example, all of the recommendations would be highlighted coming up. So find out more and then we have a HS link here, this is an opportunity I suppose to what the Find out more should look like. DH?

Res7: Just to comment on the earlier meetings, there's no mention about temperature, one of the paradoxes with ozone is that it is a worse problem when it is nice and sunny and a pleasant day, such as the need to be something in there that ozone is a worse problem when it's sunny and a pleasant day?

Int: Yes, there absolutely does. That is something that I will feedback, and that was something that I suggested last time. There are ways to go here. One of the health recommendations that I had in the that I would have here would be to exercise in the cooler parts of the day.

Res7: That may not be true. Ozone levels are generally higher on periods of good sunny weather, so it doesn't matter what time of day it is, when it's nice bright and sunny is when the problem is worse, which is a paradox that most people don't know or understand.

Int: So do you mean radiation rather than temperature?

Res7: But it's both, temperature contributes to the catalytic formation of ozone, but also the sunlight is involved in that process, bright sunny days are when your ozone levels of worse anyway, and it interacts. So temperature will interact and cause worse respiratory health in countries, they are multiplicative. It's just making it a little bit more complex, and the educational bit pointing out that just because it looks like a nice bright sunny day, it doesn't mean the air quality is good; which is something that most people I don't think understand.

Int: That's really useful, thank you. When I send round the slide, I would have a little survey to ask if you can improve on this, and it will be really great to capture some of what you would say as a health recommendation. I said in the morning rather than the afternoon, but that doesn't mean anything.

Res7: Avoid going out completely is the answer or avoid exercise on those days.

Int: Outdoors?

Res7: Well possibly indoors as well, we don't know, but certainly outdoors.

Int: Thank you very much, that's really important to think about. When I send around that survey if there's anything more specific, any more specific suggestions around that. That is the basics of the first educational module, keep that version in mind. This is the second version.

<Displays - Educational Module #2 slide>

<Displays - Air pollution and Health slide>

<Displays - Air Pollution can impact your health and well-being slide>

<Displays - Ozone in the air can make it hard to breathe slide>

<Displays - Where Ozone it come from? slide>

<Displays - Methane in the air comes from oil production, indoor cookers, waste processing and cows slide>

<Displays - Methane is an important emission that contributes to the formation of ozone in the air that we breathe slide>

<Displays - Ozone is produced when sunlight mixes with emissions from factories, cars, houses and agriculture slide>

<Displays - How can I protect my health? slide>

< Displays There lots of things you can do to protect your health on days when ozone levels might make it hard to breathe slide>

<Displays – Close the window, consider later exercise today, exercise lighter in the morning, exercise in the morning rather than the afternoon, use your preventative inhaler today, pack your blue inhaler if you're going out. slide>

<Displays – Find out more slide>

Int: It's basically the same information. This probably be more opportunity to be universal with one of these options best is the other bit.

<Displays – Time to vote slide> Hands up for #1, #2, why?

Int: Can you please raise your hand if you prefer the first option? Seven raised hands. Please raise your hands for the second option. That was about 10 people. So I will invite you now just to raise your hand if you would like to speak, as opposed to voting this time, to tell us why you have that perspective, if you still have a raised hand at this point, I would assume it's because you want to say something. The first raised hand that we've got is R?

Res15: I couldn't vote for the thing I wanted to vote for, I had to kind of weigh it up, which is on the left-hand side the image of the person coughing, and on the right hand side the infographics of the things, I couldn't vote for that. The reason I would have voted for that, the left hand one for the person coughing, it makes it human. I think that's an important aspect of it. But interestingly, maybe it's just me, on the right-hand side with the infographics, I think it made it more accessible, something about the cow that and the scale of the cooker next to this great big industrial thing, I didn't know quite what that was but I know the nodding donkey signifies oil. I think from an inceptive perspective, if I had to tell one on the left and the bottom one on the right, I would actually understand what was being talked about. Humans on the left and then those infographics to know exactly what we are indicating. I couldn't vote for it, in the end the infographics won, I didn't have the option to put the two together.

Int: That's really useful, thank you. N?

Res14: R articulated what I was going to say. The other thing that I was going to add though, I wonder if the data intensity of whatever images you are using is also something to consider. If you're talking about in some rural areas, the signal that people might have, I guess it might get loaded onto some people's phones so that the assets are all stored locally on the device, or if they are downloading things in real time when they have a signal. You might also be thinking about what is more intensive that could be prohibitive I guess if it's photo real images.

Int: It's a really good point and what we're looking at is combinations of things, what is embedded in the app versus what links to a website. There are agile options. I can't explain it because I don't understand the tech side of it properly, but apparently there are options you can do with your phone is like – Hello, I have more data therefore I can do more things, versus – Hello, I don't have more data, I can only do minimal things. And it interacts with the software in that way. But yes, that is a really good point that we should take back. K?

Res8: I agree on the infographics, certainly the person on the front as well, and the actual infographics on the second one. On the original one that people who weren't on the call won't have seen, we had a lot of data and information all on the slides, so it was quite busy and quite difficult to pick up the main messages. So I think the one on the left is really good for the simplicity, the reason that I voted for the one on the right is because you have been able to provide the additional information in a way that doesn't create noise. You can look at the additional information if you want to, or you can just get the overview from the pictures that you are being shown, so that's a really good balance actually. I think the ability to provide that additional information and narrative as you to provide some context because I think that D raised a really important point about exactly what this means for people with respiratory issues - When should they be going out? How should they be going out? What are the other things that they should consider? Who are we talking to because the circumstances are different every single time? You are providing different advice to different people. I think being able to provide that context is really important because, yes, you could say that in certain circumstances people should stay in the house and shouldn't leave the house, what we don't want to do is encourage people to stay in the house and not leave the house who really on balance would get better impact by going out and exercising despite the fact that there is ozone. I just think we need to balance some of those public health messages, and we should have the evidence available that allows us to draw that balance from the right sort of people. I think without having to make any of those messages too complicated, you can use some of the ability to provide that narrative to give some of the context that people can make informed choices.

Int: Thank you, that's really useful. We probably need to have some further chats on this about what those public health messages should look like. I suppose this is about helping people understand their health so they can make sensible decisions, rather than scaring people into never leaving the house again; which I think was raised as an unintended consequence in the last meeting as well. I think S is our last hand?

Res3: I'm sort of backwards and forwards on this one, I keep changing my mind. I get the comments about the human factor with the top image on the left, with the children and young people’s hat on, I'm just wondering where the image on the right has a wider scope in terms of age groups, whereas for younger people, I'm not sure whether the photo image would resonate as well as just the shadow image. For me, for children and young people, I'm not entirely sure this is going to grasp their attention, if you see what I'm getting at?

Int: I do, yes; whereas things like the inhaler going in the backpack is a bit more explicit?

Res3: Yes.

Int: It's sounding very much like it is a combination of the two here, with the very explicit image of the human being coughing and then a bit more…K?

Res8: I want a second go! S Just reminded me of something that I thought when you were talking earlier about how do you make it sufficiently generic and transferable that it’s right for everybody. I think in some cases, possibly you can't, so it might be useful to consider having versions said people can download or use the version that is most suitable to them. Because you can't necessarily globally transferable, and you can't necessarily get something that is transferable to children in the same way the day is for adults. You probably need to think a little bit about who is the audience for this. The audience is parents and adults, then you would go with one route, if another audience is the children themselves, then it might be that they need a different version. I don't think it would be a huge push to make two or three versions so that people can download the one that is most appropriate to them.

Int: That seems to be what other people are saying so C has said – Can’t we have a first slide tailored for different folks, and then the right-hand graphics for all. N has said that he agrees that thinking about inclusiveness of photo images as if going with these, perhaps with personalization. C has agreed with this.

Res15: Is everybody aware that the mother whose child was declared died of traffic pollution, a few years ago in London, the government has just apologised and compensated the mother, the daughter has died of asthma at nine years old. I think was the first person in the country if not for the world to have air pollution on the death certificate as a cause of death. I think just last week the government apologised for that.

Int: Thank you, I didn't know that. S?

Res9: So the issue that I wanted to help emphasise, was the context, particularly the fact that you're going to be conducting this study in a number of locations; even if it's within the same country, probably different regions, and it will be good to get a local perspective before you rule out images. When your colleagues were giving the emphasis on it, I could relate it to a situation where the WHO have tried to eradicate diarrhoea in a community by printing photographs of the house fly, flashed it over the community, people came out and looked at it and said – We don't seem to have this problem here because our flies aren't as big as what you have on your posters. It is an issue that you probably would want to consider when you want to rule out images for people to interpret, that it stays well within the context of recognition. We shouldn't hesitate to focus on communities, and be specific to communities, rather than maybe to rule out something around different locations, which may not work very well.

Int: Thank you that's a good thought process for us. C?

Res10: I just wanted to first thank D and S for joining. I'll say keep me right with my own ideas, with your expertise, but one of the reasons why I chose the left hand rather than the right hand set, like in terms of the local context in Lincolnshire I guess, and in the UK generally, we don't actually have these oil producing rigs, so the imagery for an oil production rig is not something that is recognisable in the UK landscape. I was thinking something more like the oil refineries that you get in Lincolnshire would be more appropriate. The other thing is that when you get a cloud of methane, it is an invisible gas, I wondered if there was something misleading and actually depicting it, people might be expecting to see something that is a hazard for their health, when actually it's not visible, I don't know how that works in terms of actually warning people.

Int: Yes, that's a tough one actually, how do you represent visually something that you can't see? Really good point we don't want to be scientifically misleading that's a really good point we don't want to be scientifically misleading, so we have to be really good think about that. C has said that we do have nodding donkeys in Lincolnshire. I had thought that we have, but I could be wrong about that. It might be about what's in the public knowledge as well, and what people relate to as opposed to what is technically there. But these are all things to think about. K has maybe the bubbles without the smoke, I was just thinking about at the same time. The bubbles are kind of like here is something in the air versus the smoke, which is about visual emissions. C, does that make sense with where you were going with that, maybe bubbles rather than having smoke?

Res10: Yes, that would indicate a different air composition without it being visible.

Int: D?

Res7: Quickly following on from that, the paradox about temperature, there is also the paradox - this is pollution that you cannot see. I think people are used to seeing pollution as, you know, dirty air, if you go to somewhere like India, the air looks terrible. Here it doesn't. So I think emphasising that this is an invisible pollutant as well should be part of the key message and the imagery maybe needs to reflect that. Just an overall thought, you talked about photographic imaging, could it not be done in more of a cartoon format that would be applicable to all age groups, more attractive. To me, both of these look quite technical. You are trying to reach an audience that doesn't know anything about it. So something like a Simpsons type cartoon thing on it.

Int: That was originally what I had hoped for, and I suppose this is my naivete in understanding about the time and costs of design. So this is a prototype project. We are applying for some bigger funds to hopefully continue this sort of work with the design and development company, but I certainly wasn't aware of the time involved even in simply presenting this sort of content in the way that it's in. So where we're at now, I should mention, is a balance of the resource is that we have of what the design and development company can do, rather than what we might think of as an ideal, you know, an ideal outcome. C has said – danger in cartoons, he could dumb down the message. K has said - We need the right amount of bubbles for each source depending on the impact or the same across all, so it doesn't mislead. That's really interesting point. So should there be more coming from the bits in the image where we know that there are likely to be more inputs of methane. Should we be having less from a microwave, more from an oil refinery, that sort of thing. R?

Res15: Just based on someone who knows nothing, I don't know anything about methane and all those things, I've come to this without a background of knowledge, what I would say from what I read from these images, particularly from seeing the other ones, I do read that it is invisible: those images say to me that this is invisible. Is not coloured, it is not brown, the fact that it's white and see through. I don't look at a cow with some white gas coming out of his bum, and think – Is that stuff you can see? I know that that is invisible. So my reading of it is that actually I think it works really well. I take from it that it is invisible, and I understand that. I think the cartoon route, as C mentioned, does potentially dumb down the message and make it seem less serious and less impactful. Maybe I'm being influenced somewhat by what we were looking at last time, and actually been quite impressed at the extent that it has changed and improved.

Int: Thank you, that's great feedback and I will pass it back to Common Knowledge. Something to think about is whether everybody would view this as being invisible, if there's anything we can do heighten that. S also highlights the fact that the amount of' ozone symbols, does that represent the amount of ozone. How scientifically accurate are we being, this is something we probably have to consider. S?

Res3: I don't know whether we are getting too wrapped up in some of the scientific element of it here, thinking more widely of who this app is for, rather than the people sat on the call. I think we actually have to reach out to those people; I know for some people sat on this call, that they have asthma and they're going to have personal experience, but I don't think it's a wide enough group. I think we need to explore that personalization area rather than us saying that it needs to be scientifically accurate. I don't think most people which really bother about how many bubbles there are coming out of the cow’s bum as opposed to the oven, I think we need to go out to the wider population who would actually use the app If we really want to know what they're going to think.

Int: Thank you, it might be that some of those ‘find out more’ bits have the opportunity for the scientific stuff, whereas this is about a general message. Thank you R as well, we need to ask the public what they understand. So this is all the next steps to take. Anybody who does have opportunities for this, I did try to capture this in a follow up e-mail last time about – Are their communities of practice, or community groups we can go to with this content? R?

Res18: Just another comment about the bubbles that I made, I would probably actually look at that image, and say – Oh my goodness, all that when I do the cooking. It's going to be different things to different people. So again, it needs a wider public audience I think. I'm sure you'll get a lot of different sponsors.

Int: I think there are some opportunities to do this, and I love to follow it up certainly between now and the next stakeholder meeting, we could even put some content together in a simple survey format and ask people what they think and feel about it. Or even have some community groups that we can go along to and present some material and see what people think. I think that would be really useful. So we'll move along to the next batch of stuff because Common Knowledge have done a lot of stuff for us. But that was really helpful, thank you for everybody's insights on that one.

<Displays Map Development slide>

Int: They have also gone away and done some developments on the map function. For those who were in the meeting last time, part of the remit of this project is that on your phone you will be able to see a map, you will be able to zoom in on the region of the choice where you are living, you will be able to access some map functions. So part of this is about helping people understand by visualising the relationship between methane, ozone and temperature and health outcomes. So we are working with the ICB around some future ways of representing aggregate health conditions geospatially. We are also working with EMAS data at the moment. So what we have now in the prototype that I'm about to show you is really just a reference to the EMAS data. But in the future, we might have ICB data in there as well. So the idea is that you as the user can click on features to say – I want to see on the map but the ozone levels are today, or I want to click on the map and see over time other methane levels have changed. So you might be able to scan through the years and the map changes. We also want to show how that could intersect with help outcomes. We've had some conversations about how you might do that. This is what our design and about the team have come up with. Actually, I had add opportunity to feedback before they presented me with the final components of this. So I'll talk you through a little bit of that.

<Displays map Data slide>

Int: So this is a lot to look at. Again, I will be sending all of this round. The image on the far left, this was their suggestion, and I think it's really cool, if we have archival data listen think like methane for a region, you press play, or you can drag. You can drag the cursor and see overtime how the levels of change through an area. So this is one way of displaying methane. For those of us aware displaying the complexities of where we get the thing data from and its reliability and everything, that's a conversation for another time that if anyone is interested. I've been attending a lot of air quality conferences. I've been connecting with the European remote sensing community. I have been interacting with various satellite companies. I have been doing a lot of work in that space. But for now, we're going to use Sentinal satellite data. There is a satellite that captures methane data. For now, we are going with the aggregate data which we can basically only use on the yearly basis, but that's fine for now. So this is what that would look like. To the far right, originally the design company had health outcomes down there, and instead of vulnerability, they had relative risk. We decided that relative risk would not be a term that people would understand, it is quite ambiguous. But for people who want to understand the relationship between health and the environmental conditions, this is an index that we have worked with before which is per population, what is the rate of X. In this case we have here with reference to EMAS, the ambulance data, so we're talking about acute or chronic flare ups where people end up calling an ambulance. We're just using this in the prototype because that's the data that we have to be able to show in aggregate way on a map to help people understand, but we could be doing this in anyway. I appreciate this is way more science based. We are struggling a little bit to represent how outcomes along with environmental condition in a way that won't be ‘super sciency’. It is a bit of a difficult one. It might be that this is a function. - You could use one in five. Yes, one in five could be much more useful than using 0.8. Absolutely. We could actually be doing it that way. C?

Res10: There are a couple of things troubling me with this slide. The first one is the colour scale on the maps that you have, essentially white areas which are not shown in the actual colour scale in the middle of. So I'm not entirely sure what these white areas represent. The other thing is that there's a metric there – 180 DU, I was wondering what purpose that metric was there for, weather is supposed to be surface ozone, but it's obviously stressing stratospheric ozone from the units, but whether it's representation of how much UV is actually coming through to the surface?

Int: That's a really good question. I received these slides a handful of days ago, and the first thing that I picked up on was relative risk is probably not useful, let's talk about the health profile for an area. I will admit that I had a knockaround to saying – What is this ozone DU? This is not on-ground ozone. So we probably need to also talk about that. Again, there are some complexities around this and maybe it's a conversation for another time, again getting my head around the data sets available for forecasting for the UK compared to Ghana as well has been really challenging, and we need something that is consistent and accurate as it can be, this is a work in progress. Thank you for pointing that out. That was one of the ones I hadn't got around to go back to the design team and saying – What is this? That was also a good point that C makes about scales and making sure that the colour schemes represent a useful representation that is understandable, but this is what they have given us so far. D Have said could the health risk be better illustrated by having 100 people outlines. That is such a good idea. I was sitting here thinking I was a data scientist, and I don't know how to do things outside of numbers, that's such a good idea. K?

Res8: I was just about to say something similar actually with 10 people. We have 10 little images of people, what we normally do with our infographics is have 10 outlines, and then just shared in across the amount. Even if it just amounts to somebody being 1/3 coloured in, it's just the scale of it. I think that makes a lot more sense. Maybe 10 rather than 5 is actually easier to calculate for people because it doesn't matter what rate you use for population, whether it's thousands or whatever.

Int: Yes, D, I love your idea, but I don't think we'll get 100 people on this tiny phone app.

Res7: I agree with the point about 10, but the point about 100 is that it puts it in perspective. If you have got 100, and you've only got 10 coloured in, you see that most people are not affected. I just think it's a perception thing. Maybe 50 or something then. I think larger than 10 I would suggest, because it implies that most people are going to be infected.

Int: Yes, and if you're talking about respiratory health and acute disease. Part of what we were asked to do about this, the Welcome Trust is really interested in disaggregating between chronic and acute. So when it comes to mental health, that means things like anxiety and depression, move disorders, versus psychosis, behavioural disturbance. And with respiratory, that means differences between infections and contagious disease and flare up of asthma.

Res7: So you could use different colours for immediate effects and long term effects. Have people bright red for immediate, and for people blue for longer term effects or something like that.

Int: Welcome N, do you want to just briefly say who you are to everyone, we're in the middle of all sorts of things?

Res21: I am so sorry that I am late. I am NN. I am an air quality scientist at the Met Office, I'm currently looking to oversee basically lots of progress with the SPF clean air research programme. We have sponsored quite a range of work, air quality related work, right from emissions and pollutants, right through to their concentrations of exposure both indoor and outdoor. But because we're trying to do this thing very holistically, we've roped in a lot of other people who don't normally get involved in developing solutions. So everyone from the third sector policy people, you know so we're trying to look at this properly in the round to make it far more holistic which is making it more difficult of course, but hopefully it will mean that the solutions we develop will be a bit more sustainable.

Int: Thank you for that introduction. So we were going through the visuals for the phone app that we are co-producing together some of the suggestions from the designer development company about how to represent health profiles and vulnerability. We've just had some really excellent suggestions from our colleagues about - Can we do this in a visual way rather than vulnerability in a numeric way that a lot of people wouldn't understand. I really like the idea of having a certain number of little people. D was saying that we need 100 people, S was actually saying 10 people would be enough. We're just sort of thinking how do you represent, if you have a certain number of people coloured in to show how many are affected, but how do you do that in a way that doesn't misrepresent. D was concerned that if you had two out of 10 coloured, that looks like quite a lot, whereas if you have 20% of 100, it doesn't look like as much.

Res21: I'm very interested in that at the moment because as you know, we've already created air quality data portal, one of the things that we're grappling with at the moment is how to represent matters exactly like this. Its fine representing concentrations but when you start linking it with health, this is where it starts to become a bit tricky, you have to be very careful what you convey.

Int: N, you have an expert group of healthcare professionals on the phone today who can advise on these sorts of things, and our community, we've got some community members here today who can give input from community sides, children's sides, all sorts. This is a great sort of environment to be brainstorming: how do we actually do this in a way that is inclusive? For me, when I look at an image like that, I love it, because I am a data scientist and I like numbers. But what does that mean to everybody else? So these are the sorts of questions that we are addressing here. The next slide is similar, just showing a different area.

<Shows different area slides>

Int: So this was the interesting one. I literally ripped this up from ambulance data about 48 hours ago. K - I think it depends on the size of the outcome thought you are depicting, if the risk is 2%, it's better represented on 50 to 100 people then 1 foot of a group of 10. Yes, one Foot of a group of 10 would look a little weird! That is a very good point. There may be a design solution to showing 100 people who are very small but then we have to think about accessibility and visual impairment and all sorts of other things. So I think it's a watch this space and let's continue looking and talking about this. E, sorry if some of this doesn't particularly read well, for the purpose of demonstration, this was an example of the agile design, so you might have the maps, but I think the idea was to learn more about data here. So it might be that you have for the methane – Learn more about here. And it links to more information – This is methane, this is what it's about. Learn more about methane emissions here. And then when you click on the For further is taking you to a website, it could be an academic article, it could be a combination of the two. The same for health profiles. A little bit about our data and why we're using ambulance data. At this point it’s data that we have been working with. They have prepared this because this is the data that we have been working with, in reality, we probably can't use that data in Ghana, because we don't have that data. This is another challenge of working across data rich or data scarce environments, is that I’ve said to our design development company, that I don't think we're going to be able to use the same metrics across everywhere, and what we're going to have to do is establish the best health data that we can to represent for different regions. In the UK, we are incredibly spoilt for choice when it comes to high quality data. So at this point we can work with EMAS data. Down the track, we might be working with ICB data, in a similar sort of aggregate way, and people can see hello area and over time how outcomes have changed in relation to environmental conditions. This again is work in progress but we're hoping by the end of the prototype that we have something that shows – Here is ozone changing over time. Here is methane changing over time. You can click on an area and get a health profile. It gives you a summary and synthesis of environmental condition, temperature and ozone and health outcomes. That's sort of where we're at with that approach at the moment.

<Displays thoughts/comments/concerns slide>

Int: I feel like we've been talking through this as we have been going but if there are any. Like I said I'll send this round for everybody to look at. I have all these images as a PDF. I will send it around with the survey option for people who want to give more detail and feedback, or even wants a separate conversation on how this stuff is done. Certainly N, if you are looking at doing similar things, from this we will create transcripts and share them with everyone, so you'll have all of our ideas, everything that's come out of these meetings as well. Just before we move on, are there any other comments that people have initially about those maps, or have we covered everything so far?

Res21: I want to ask a quick question with regards to the health impacts, how one works out say exposure to a particular concentration? The reason why I ask, one of our clean air programme projects has developed an exposure modelling system, and obviously if you're looking at exposure, it's no good looking at what goes on outside a closed environment, so it takes into consideration both indoor and outdoor pollutants to give an all-round exposure, or indication of exposure. The question that I'd like to ask this group is, with that kind of information, what would the health people do with that information? If we said over a particular period of time, a particular metric or whatever, our exposure to Nox or ozone or whatever it is, if we take into consideration both indoor and outdoor, how would you use that information? Would that be useful?

Int: D?

Res7: I spent a lot of time working with the Met Office forecasting for COPD, it's very difficult to do that in practice because your aggregate exposure is not what an individual’s exposure will be. We were talking earlier about if somebody chooses not to go out today, and they stay inside, that might be a very positive response to the environmental conditions but negates the predictive value of the environmental condition because they are not being exposed to it. Without wanting to over complicate that graphic, we were just talking about it, that may be in that graphic that you have two scenarios, if you stay inside today this is your risk, if you go out today then this is your risk, so that could help people make a choice of what they do rather than us either predicting the effects, or being directive about how they should respond.

Res21: That's really interesting. I think I might send this to the group afterwards as well explanation updates, it's called the Dymex, it's one of these agent based modelling approaches, so they've gone through and worked out by socioeconomic, by age group, by a whole different type of ways of categorising people, the proportion of time that people spend in the house, or other closed environments whether it be schools or offices or cars for example. One of the things we're looking to do now is to validate it properly because it's all well and good using agent-based approaches to estimate a certain percentage of the population in a particular area, how much time you spend in any one of these micro environments, to validate it will be very good.

Res7: I think those models are fantastic at a population level for epidemiology and global policy, for an individual patient, what matters to them, I might be out 100% today, I'll be in 100%, I am aged 45. The aggregation is useful to look at population impacts, but not necessarily personal.

Int: N comments here around initial data gathering, and something he can have in a health profile for example, is self-reporting to say how much time you spend indoors, outdoors. I'm aware that S wants to follow up?

Res9: I think this has been partially mentioned by D, the measures that we get in the models that we try to create for populations, in this case for individuals. I was going to make an earlier comment about data, particularly the one you talked about, the fact that we can probably develop something here, but it might not be applicable to Ghana because of data issues. I was wondering if your counterpart there may not be able to benefit from the modelling approach using the local data because I know within the UK system data is everywhere: you can literally log into one particular facility, obtain data and use it for a lot of things. In Ghana, data is being collected but in silos, how we decide to conduct a project like this, it is still possible to find a way of maybe accessing specific datasets within certain areas. So for example, the Ghana Health Service, the government has something called District Health Management System – DHMS. When you go into that data, you realise it's not very helpful, so researchers tend to go back to their clinics and then to hospitals to literally digitally collect the data variables that you are interested in. So if you develop a model here where you knew that socioeconomic indicators may be geographical, location, and maybe some other demographic factors are useful in predicting an outcome, you can also hunt for some of those variables from the local data systems and then more or less validating the models. But knowing that you would have to devote or allocate some time to collect the data.

Int: S, it would be great to have a separate conversation with you because we've gone through a lot to try to access this data, and it's gone round in circles to a certain degree, tell me maybe talk about that another time, because I'd like to get your insights on that? I'd like to move on. I had some activities planned. And then our design team said that they had done all this stuff. The final thing I want to discuss today. We have all those maps and we have the educational content that we progressed really well and how to make that accessible, we still have a long way to go with some of the issues around design elements and everything, and also N and D, maybe we could follow up another time about the indoor and outdoor air quality thing if that's OK, because we've got another project we're we are looking at indoor sensors. The final thing, and it's very similar, is hard to you ask people to self-report their health in a way that is accessible, that is robust to different health literacy backgrounds. I've been thinking a lot about things like universality of images. N?

Res21: I want to say that quite a few years ago, myself and a friend of mine, started what was the forerunner to the COPD service that C and others have been doing so well within the Met Office. We started an initiative called Forecasting the Nation's Health, as we grandly named it. The idea was to just look at hospital, ambulance basically health returns from a range of different health sources. We threw them all together using various computer algorithms, and we came up with algorithms that could forecast the workload that hospitals could expect over the winter. And we trialled it back in one particular winter, back in 98 or so, we had four hospitals sign up to it, and one of them we went with our predictions of what we would expect the impact, of in particular, a sudden cold spell would happen respiratory problems and other cardiovascular problems etc. They went with it, and they found that they saved something like £400,000 over a three-week. Eventual aim with this. If you imagine having the impact workload on a particular hospital, and you have a look at that hospital catchment area, and if within that you could using GIS techniques etc, have an idea were people of a certain age lived and/or the quality of housing, and quite a few other factors, the idea was whether or not we could circumnavigate the need for some of these people are going to go down with these problems, and actually for the hospital to send people out to those premises rather than allow them to come in to hospital. I wonder if that's something that has already been done, or is this something that you're also considering within this forum?

Int: Again, I will e-mail you and D because we're putting in another bid that is around exactly what you just said, working with a housing company ACUS. Some of the challenges that we have identified through this, and it will probably be quite useful for you as well, considering how you represent health visually is the self-assessment. If we send out an alert to somebody, to say - Look ozone in your area, forecast to be potentially problematic today. And then if we later ping them with the notification to say - How have you been today? Tell us about your day? We are asking them to self-report. And there are more sorts of academic ways of doing this that are quite quantitative and numeric, and some people, particularly say if you are a carer, my actually want that quantifiable data and you might opt into the report using these more academic measures of respiratory health, say from a new member who I'm trying to manage their asthma flare ups, and I want an evidence base to take to a doctor. We have had some communities say that actually it would be great to have that evidence base because then I have numeric data. But for some people, that might not be appropriate, and they might want something very, very rapid that they respond to. So visual self-assessment. N?

Res21: We found that when going out to people, if you said that the ultimate aim was to somehow give them personalised feedback, that we found was quite good encouragement for them to actually give us the sort of information that that they wanted. It might not be appropriate in this case.

Int: It's a difficult one, it can't be personalised, in the sense that it's not a health professional giving feedback because this is an app, it's not linked to a health service. But what it can do, if you self-report over a period, you are then able to graphically see that this is what ozone and temperature were for these days, and this is what I self-reported. So it's enabling people to see thresholds that the person that they are caring for starts to have negative health outcomes. So in that sense, we're looking at options where you could make this more bespoke to your observations of your own health. So maybe actually I'm not that sensitive to ozone, so I probably don't need to be told not to leave the house or have that recommended to me unless it's very, very high concentrations versus you might say you have a child who's very, very sensitive, and you say that actually you would appreciate that guidance at lower ozone concentrations. We are looking at there being a bespoke element, but the question is how do you get to that point? How do you get to that point at generating that data? The idea that we came up with, and this is following feedback from the last meeting is the use of visual analogue scales. So these are scales and I put some resource is there around what these are.

<Displays Visual Self-assessment slide>

* Used to measure experiences that are typically difficult to measure conventionally e.g. pain;
* Involve a 100 millimetre horizontal continuum from none to extreme state.
* Tend to be the most reliable for measuring change in an individual rather than comparing between individuals.

<Displays Co-Design slide>

* We will present some content, including variations on validated measures, and some novel measures;
* Give you the opportunity to vote on options and give you more detailed feedback;
* This process will inform the visual self-assessment tools embedded in the ME-NET platform!

Int: Commonly used for pain and well-being, scales exist for happiness and sadness, anxiety, confusion, boredom and excitement. Some validated picture-based scales for symptoms of psychosis. No validating picture-based scales for respiratory systems. I have found a widget company that produces some validated pictures symptoms of psychosis. If you want to differentiate between moods of happiness and sadness, the fact the air quality has on more behavioural, more extreme mental health presentations, that becomes more challenging. What I found is that we don't have validated scales from respiratory systems, there are pictures of respiratory systems, but we don't have validated scales in the same way that we have the things like pain and wellbeing. I'm looking into - can we work with a widget company to potentially deal with respiratory scales, that could be used in children for example, rather than just – Are you coughing, are you not coughing? The scales that are like me today versus me yesterday that might be helpful for capturing the respiratory health of people in a very, very simple way. So this is what an analogue visual scale looks like.

<Displays visual analogue scales slide>

Int: And these are the most common versions. N and I had a really good chat about the benefits and limitations of both approaches. And actually, is it that the most useful approach is to go from neutral to emotion, rather than from happy to sad. Because happy to sad doesn't allow for no emotion, which is actually quite important when it comes to some presentations with mental health. So I'm wondering from our perspective, if we can do that little hand raising exercise again, vertical or horizontal? Can I see a raise of hands for a preference of a vertical representation? So a couple for vertical. What about a raise of hands for horizontal? So that's an overwhelming 13. That's interesting, why?

Res9: It's probably a bit of bias, because many of the skills and these kind of measures come up, and we often read them and present them horizontally. But it would be good to actually test and see what community, that a local context would prefer.

Int: So consistency with previous applications. R?

Res15: It just feels more natural to me, it is the way that we read, I wouldn't need to work anything out. But what also put me off, what I don't like is the actual emojis themselves on the left or right, they seem extremely happy or completely lost their mind! I think just a general smile would work better!

Int: This is not what we go with, this is just a show for concept. R?

Res18: I just think the neutral to sad, the vertical one, it could psychologically suggest that you are probably sadder than you are. Because it's just going down visually comment you know it's I'm trying to say?

Int: I thought the same thing and I was wondering if I was the only one that thought that. It's a bit loaded, being higher and lower. N?

Res21: I just thought that the whole left to right sliding scale seem to be more appropriate to the way people think. But then I was thinking about this, the vertical one, when you are down you are sad, and when you're happy you are up. Maybe that also works. Us is just being said, maybe it's biassing, is loading, I don't know. I'm now confused! C has just said from the vertical I would expect neutral to be at the bottom.

Int: That is confusing. J

Res11: I was also biassed, but when I looked at the first image of the top, you are maybe expecting energetic to be at the top, as if you're energised, you're probably going up. So you wouldn't expect energetic to be at the top. That's why I did not go with that one and I went with the bottom one.

Int: So we feel there is some loading in up and down that is a little bit unhelpful and could be confusing, and when you're in a scale going side to side, that is less confusing, that makes a lot of sense, thank you. The next little exercise and there is quite a lot in this content.

<Displays Respiratory systems slide>

1. Shortness of breath
2. Coughing
3. Chest tightness
4. Fatigue

Int: I've been thinking about respiratory systems and what the typical measures are for. This is all I've literally been able to find.

<Displays Respiratory widgets slide>

Int: This is all I've been able to find, which is people. I suppose that the mental health which is more advanced, you have your universality, it's just a line drawing of a person as opposed to a detailed image of a person, but this is the sort of stuff that I've identified exists. What I'm wondering about is can we work with our design and development team, or with the widget company who I have now been in touch with to develop some respiratory widgets that are similar to the kind of widgets that you get with line drawing type things for mental health and well-being. So to my knowledge, this doesn't exist yet. C says there are some crossovers between mental health experiences and respiratory health experiences that needs to be captured here. I think there is an opportunity to develop some widgets that capture some of these experiences that could be used with patients and children and carers; particularly for young children. I’d be interested to know if Apple Health has anything like that for respiratory. We could be pioneering some of this stuff, and if it comes to that and we have an opportunity to work with Widget to do that, maybe I would put out an invitation and say who wants to be involved in that conversation, what does this need to look like? In a way that would be useful for children, for general public, and I think we can commission some of that work. This is basically all I could find was images. So some considerations around this

* Line scale from now on to lots or an image with an option to select yes or no for the day
* More meaningful to measure an amount of coughing or to capture yes or no?
* We might work with a widget company to do that some of these.

<Displays Mental health symptoms slide>

1. Anxiety
2. Depression
3. No effect
4. Intrusive thoughts/sounds
5. Paranoia
6. Hearing/seeing things others can't
7. Energy levels
8. What else?

Int: Some of the widgets that they have are things like <above>. N how do I add a conversation, and I did a whole bunch of sketches around this cover, which is how do you represent intrusive thoughts/sounds? How do you visually represent paranoia? Hearing and seeing things that others can't? This is really challenging.

<Displays Mental health widgets options slide>

* Adapting existing resources for the ME\_NET platform;
* Developing our own widgets (probably not visible now);
* Maybe we can trial how existing widgets are received in the application for self-reporting.

Int: For a time, what we're looking at is this mental health pack which is the symbolic communication tool for psychiatric evaluation. And this is what some of those widgets look like.

<Displays Mental widgets exercise slide>

Int: So I have a little exercise here which is to take a look at some of these widgets and think about your lived experience as well as the people in your life.

* Are these widgets clear?
* Do you think they would be clear to people you know?
* Potential negative consequences?

Int: I will ask you either on your phones or your computers to open up this thing which has three survey items, and this is about how you would interpret the widgets, how this might interpret them and then any unintended consequences? S?

Res9: I may be repeating myself here, they're great images and then you can easily connect what is written underneath with what you are seeing. But if there wasn't anything at all, and you asked me, I probably would have guessed a lot. So my thoughts are that you will still be able to adopt some images from whichever context you are dealing with. I believe if you think about adding some narratives to the imagery that will help people connect faster than just having the image alone and expecting that they pick it up. Have because for some images that people are used to on their phones, most of these icons that we are using on the phones, they've been there for a while, and we've learned them over time. But now we're going to be introducing telling you brand new images which connected particularly clinical issues that we are dealing with. I would go ahead and use it but other bits of narrative to help people connect it. For instance, look at the image oof paranoid, if I were to look at it and say that you can have so many interpretations to it. So if there could be some narrative to follow the images, I think it would help do the trick.

Int: Yes. R has said that she thinks it would have been useful if they weren't labelled so you would be able to give a more objective sense if you understood them?

Res18: Yes, I do.

Int: N?

Res21: I was wondering whether or not with mental health issues, especially if you're looking to tie it with air quality, some of them are affected by things other than poor air quality, so disentangle in the air quality element might be difficult for example, you know, levels of anxiety that are brought on by completely different things, you know? For example, people with autism might have levels of anxiety that are brought on by completely different things, you know? So 1 wonders if the objective is to look for links with air quality, how you might disentangle that signal?

Int: Yes, and whether or not you can even do that. I think it is not you're looking for correlation, you're not looking for causation. How are you going to do that outside of talking to people?

Res9: The Global Burden of Disease Team have done some estimations and they have been able to get some fractional contribution of exposure to different pollutants it is not accurate, but the methodology is there, and you can probably look at it to see if you want to adapt part of it. It helps you estimate a fractional contribution of a specific pollutant to a particular. Just go to the IHME website. If you're interested, you can look at the methodology for estimating the fractional contributions for various pollutants on specific outcomes that may help you pick and choose some of them.

Int: Please do share, that sounds really interesting. R?

Res16: I would just like to say that the analogy that I saw with this out of sight and out of mind in air, our surveys saw this terrible inequality within different parts of the city in Lincoln having a different quality of life because of the impact of poor air quality. The analogy that I saw, that if it was the water that was causing people real damage in one part of the city, it would be headlines in the newspaper, he wouldn't have to discuss scales or the density, it would be an outright outrage in the newspaper, so that the people who live in Park Ward in Lincoln are drinking water that is affecting their health and life expectancy. Because it's air, they seem to want to make it more complicated, if we see people jogging up the High Street, early in the morning clearly unaware of the toxic air that they're breathing, and it’s really because they aren't aware of it, nobody is telling them. I guess the commercial people don't want to put off motorists coming into the city centre. You have these conflicts with people living in one area who don't have a say in the air they breathe, and not really being made aware of the damage that it can cause their health.

Int: It is unfortunate that we do have to have these metrics for catching things because it's not as pronounced an issue as water. R?

Res15: Looking at the mental health widgets, I'm not sure how well I articulated this, the one I like is the constant washing, it kind of makes sense to me, it has the arrows around it, I can grasp that, it feels general, let's give me some information, that's what it relates to. I mentioned at first because there are ones that I do have a problem with like when I look at the recovery one, it makes me quite angry really, that for recovery you have a syringe of the line for it on this person that is super happy now that they've given up heroin! What? Equally, the self-harm one, the phobia seems quite ridiculous, I criticise these in the knowledge that I haven't got the solution for it, and maybe these are really difficult things to be able to capture in a widget in this way. There is something about making the widget just kind of capture the information of what this is about and what it is representing, as opposed to putting some kind of emotional judgement into it, these are really complex issues in people's lives, and to capture it in that way, maybe it just doesn't work as a concept. I don't know.

Int: I didn't put the images that I drew myself, I did a bunch of sketches around this or stuff, that I didn't put in because I don't think they are particularly useful, but I had a lot more empathetic graduation of degrees of experience in there, and N and I looked at those, and we thought they were illustrative and detailed. Part of the challenge of this stuff, is the more nuanced you get, the more you get into the zone of – I have just drawn a young white woman, that is going to be useful for people who associate with that image, I've done all this detail around it, which shows the expression and everything, but I need to give it at ethnic, socio, demographic specifications, don't I? And then it's too specific to be relatable. Then I was struggling with how do I make that most symbolic rather than capturing socio demographic characteristics? I'm not a very good at drawing and design isn't my background, but then you're getting into the zone of having to work like with design companies to a certain degree that it's like at this point we don't have the finance for. I appreciate everything you're saying. And also, the fact that a lot of this stuff was commissioned, and the fact that a lot of it probably a few of us are thinking - Ok stuff like the recovery one isn't particularly sensitive or complete or appropriate. So this is all really useful stuff. I've seen N’s suggestion that – Could you replace the syringe with a bottle of medicine? C?

Res10: Besides issues with the imagery, I was wondering if when people were experiencing worsening health, they would actually be put off from engaging with the app for instance, especially if in cases of paranoia or just distrusting or disorientation, they would just you know not trust the app on a lot of other things in one’s life zone. I can't offer a simple solution, but what we did for this year COPD service many years ago was that we had a feedback loop to the GP so that depending on what people put in or not in, at the time it was a telephone service with the sponsors people could give. Depending on their response or lack of responses, you could have the GP follow up with the individual patients as they had a dashboard of who was responding how. And I was wondering if this could be useful obviously in a different form to these widgets, whether the crisis teams and partnership trusts and GP's following patients, could actually get the feedback in the same way.

Int: I think in an ideal world that would be what you would want, maybe in future iterations down the line with an app like this, put the actual pragmatics of doing that, this then becomes an NHS health app, which the ethics alone and the development that you have to do for that, is a whole other work stream that we couldn't build into this one unfortunately. I think down the track, what you can have is a call your GP type thing, and down the truck there might be options for opting in for something like that, but you would have to have patient consent for that. You have to have a consent link for that to be made. But if you give it a couple of years, maybe that could be the direction that we go down, like having something that is a bit more registered with the NHS.

Res10: I'm just wondering if there's a risk of unintended consequences here with the fact that people might just drop off the radar on this app. I'm just wondering if there is some unintended consequences which could have ethical issues, even if it's not an NHS app officially.

Int: I mean there are things we can do like prompt people to help seek, but I think that's probably as far as we can go because people are registering anonymously. Again, a like to GP’s patients is different to having a link to people as users of an app. So it's definitely not a perfect solution, and it might mean that down the track we can building some more protective features, but I hear your concerns and share those concerns. K?

Res8: If there are things that you can't do, then this possibility these things you can do. So you know if people make particular selections or they're in a particular trend for that person - do you need support? And that's where the local stuff comes in because you can click on - Do you need support. You would be able to have something that says - Have you called your GP? Certainly in Lincolnshire and England you would say - Have you called 111, and there is a crisis line available at all times, and there is a crisis line available at all times now on 111. So you would be able to provide that sort of support. I think we've been really good at thinking about how do you get information over to people in the easiest and most transferable way, and imagery is usually really good for that. I'm not sure it's helpful in this case. I think we need to think a little bit about whether imagery is the right way to do it. And I think the specific impacts that have been drawn up for this slide, then they're not all-encompassing. I think we need to think about what should be on here. And if you can't include everything, which I don't think we can, I think we need to categorise them a little bit. Because if someone came onto this and was feeling some of these things: paranoia, distrust, intrusive thoughts, imagination playing tricks; they're all impacts of a similar thing really. Isolation and potentially in distress, you've got selective eating, but you've also got craving. You have constant washing of hands because someone is thinking of obsessive behaviours, and the first thing that you think about when you think of obsessive behaviours is constant washing. So we have constant washing on here. But actually, there's a whole range of obsessive behaviours. So I think if we maybe took this up to a higher level, but if we need to help people understand the more formal or medical terms, they might not be familiar with, you could almost put a couple of examples after it, or a couple of images after it that helped them understand what that formal term means. But I think you could categorise these actually into properly 3 or 4 categories and make it much simply. And if they click the category, to say that they are impacted, you could say negatively or positively and ask them to choose which one. But I think it would also be quite useful to use quite standard terms, because if you do use standard terms and you start to gather really good intelligence out of this, you would be able to then compare that to what's actually happening at a population level with really good intelligence and analytics that we have. So if we use standard terms, that might make some of that a bit easier, but I’m just a bit uncomfortable about some of the things on here. We also need to make sure, I did put into the chat about triggering messages, if somebody is coming on here and saying that they feel mental and they have a negative mental impact, we don't want to show them a picture of self-harm. Things like that can be quite triggering, it can cause impacts. Certainly, in terms of some of the comedy element, the cartoonish elements, not belittling some of the things people have gone through. But I definitely think we could categorise some of this a lot easier and maybe imagery isn't the right way to go.

Int: All of that is really helpful. C – Methane from cookers. L – Agree wider categories. We're not talking about unintended negative consequences around different imagery. For me personally, that makes me want to be very cautious and hold off from making decisions about specific design elements; particularly around the self-reporting mental health and the use of widgets. It might be that this is not the best way to go potentially, particularly with things that have the potential to be triggering, which I don't like the sound of at all. It might be around that standardised terminology, and then if there are images that we could use to help people understand the standardised terminology, I quite like the idea of that. So there might be that there are more standard images of somebody who's happy, someone who is sad, somebody who is anxious. Then when it comes to stuff around psychosis, or more severe mental health, there might be something a bit simpler like confused or scared. That might just be something a bit simpler that we can use to try and get at that, but not in a way that's going to have those negative consequences.

<Displays Next steps slide>

Int: I will definitely send a follow up link to the slides. I will send a little survey for anyone that didn't get say what they wanted to say in this meeting. Also, you can have a look at the content at your leisure, you might have other comments to make. You might want to capture everybody's inputs around this. There are a few people that I might follow up with emails around some other stuff. I think we all bring really unique and personal professional experience to these conversations which is really exciting for me.

<Displays Future Meetings and themes slide>

Int: I really think that, thank you very much for attending today and all your contributions, this has been really helpful and giving me loads to think about, see you next time.

Interview Ends