

Interview with Organization 1

This transcript has been anonymized to not have the organization 01 and the interviewees identity be known. Also any information regarding other companies that is not regarded of importance for this research has been deleted or anonymized.

Interviewer: Nienke van der Kooij [NK]

Interviewee: Anna Meier [AM]

01/12/2021, Microsoft Teams, 09.00

[NK]: Yeah, I think. Okay, I sent you the interview protocol beforehand I think.

[AM]: Yes, I've got that in front of me now.

[NK]: I just wanted to go through the general information really quickly, just to see if I have the information, so I can kind of put the answers of the different companies and different people I speak to in some kind of context.

[AM]: Uh-huh.

[NK]: Is everything that I put there correct or do I miss something?

[AM]: The general profile for the *[organization 01]*,

[NK]: Yeah, that's the one I got from your website I think.

[AM]: This is about as accurate I think as we can get.

So a private ancillary fund just means that in Australia it means that it's private donations. So the founders private wealth into a foundation, and they can only distribute that those amounts to other registered charities. We work, but I am also a board member, it is difficult, because I am also a board member of an NGO that can distribute overseas, so I wear quite a few hats in the work that we do around medical equipment.

[NK]: Yeah, yeah, OK.

[AM]: It's a private ancillary fund is just a technical taxation word, as you know, you could just use charity.

[NK]: Yeah, but it's a nice distinction though, since I did not really know what it meant.

[AM]: It's a tax thing.

[NK]: So do you only have an office in Australia or also some in Africa as well?

[AM]: We are small. In Australia we have the two founders *[personal information]* And then there's me, I came on initially to do accounts work but now I generally do equipment and program work. We have a programs director, and then I have someone who works with me on the side, which is in the medical equipment which is basically logistics and procurement. We also have a finance manager that manages a range of things including this foundation. The foundation is the main program. So you could say that we have 6 staff, but they're not all paid, even though they're all working full time, really.

[NK]: Yeah, and do you have any field experience going to Africa too?

[AM]: Yeah, so we try to get to Africa two to three times a year, but that's been difficult ofcourse. So there has been no travel for the last 18 months. But generally we do try and do a minimum of two week trips and capture about two countries in that trip.

[NK]: Yeah, I can imagine that has been difficult. My colleagues were in Malawi last week and just managed to get back because you had to get back from Malawi as soon as possible due to the Omikron.

[AM]: What were they doing in Malawi?

[NK]: That's because the company I'm doing this work for, *[company for which this research was done]*, are developing a neonatal monitor for in low resource settings. They are working together with a hospital and university and Malawi as their first test site, so they went again for some field work.

[AM]: Which hospital in Malawi, do you know?

[NK]: I don't know. I think one of the bigger cities because of the partnership with the university.

[AM]: Yeah, we have a lot of networks in Malawi for our work.

[00:04:00]

[AM]: For our work, which might come up again later.

So basically I want to kind of give you a debrief on the *[organization 01]*. We are primarily interested in health programs. We're interested in direct outputs now. We always have our eye on what development is, but as a small foundation we think that we have impact in being agile and doing things now rather than working on things that the multilaterals and bilateral funding works on, in terms of broader development.

And so in terms of medical equipment, that means we've found a range of things that we can see will increase the efficiency of certain of our partner facilities that we come across, without too much training. For example, a vital signs monitor with a nurse that knows how to use a vital signs monitor can increase the efficiency of the outpatients department.

[NK]: Yeah.

[AM]: And that's kind of our formula to slot equipment in that we know is as robust and as suitable for context as you can get without being overly expensive. So that's the program that we run. The founders generally have traveled for about 1/3 of the year, because most of our programs are in Asia. So they do most of their travel in Asia, and then *[name]* and I will be traveling maybe one to two months every year, visit our programs, check in with our partners, meet people.

[NK]: Yeah.

[AM]: And one of the ways that we in the foundation how we go about things is we base a lot of our work on relationships. Which means that you do need to travel quite a bit, but I've got young children so I can't travel more than that. So we do a lot of calls. I probably do a call every morning and every night with US partners, or Africa, or Europe.

[NK]: So you try to bring them medical technology that's robust and it doesn't really need any training? The reason I am doing this research is because that's being said quite a lot, but it's

also a given fact that about 70% of the technology that you would use in a high resource setting is not really usable over there, or seems to fail.

[AM]: I agree.

[NK]: As far as it not needing any maintenance, do you sometimes come across technologies that you do ...

[AM]: No not maintenance, training.

[NK]: Oh, so only training.

[AM]: Yeah, so there's a lot we have learned in the course of 10 years and what we try to do is to find products that are as user friendly as we can get, without again becoming like the big expensive Philips equipment or things like that which are just really cost prohibitive. And the balance is that if they have as little consumables as possible and as little likelihood to have faults that need local servicing, this has been the model we have looked at. But we do partner with quite a big network of biomedical engineers to provide that service. We generally send spare parts.

[NK]: Uh-huh.

[AM]: We don't do reverse logistics, but if something breaks we tend to be able to help resolve it either by the dispatch of a spare part, and I think I should step back to just explain a little bit more about how we do this program.

So, *[organization 01]* funds the work that I do, but what we do is we partner with Rotary International who here in Australia are called the Rotary Australia And what they do is they, ehm, we find partners who have some gaps, like, let's say vital signs monitors in outpatients. The nurses know how to use them, they just need them. You know they're using at the moment. They're using a fingertip oximeter, or they're using maybe an AA battery blood pressure monitor.

And we say, well, we've got a vital signs monitor that we can donate to you. It has a rechargeable battery. It has both of those things built in, it's quite robust. So what we do is Rotary Australia purchases that equipment but to purchase equipment is difficult, getting the best bulk deals.

So essentially, we have a company now called *[import and distribution company of organization 01]*. We import and distribute. We are a medical equipment sales company. We don't manufacture ourselves, but essentially by buying it we take on the warranty in a way. So any warranty claims we handle, but there is no such thing really, in Africa.

[NK]: Uh-huh.

[AM]: There is very little, unless there is local brand representation, reverse logistics that actually happen.

Think about all the oxygen concentrators that are going out through UNICEF and through the WHO for the COVID response. They might have a warranty, but there is no way that any of those are actually going to ever get serviced, or ever have a warranty claim that is successful because of the reverse logistics needed to take them back to whomever distributed them.

So what we do is tend to say, we can't solve that spare parts and the servicing with what we do. But because on the foundation side we maintain the relationship, we follow through anyway. So we still follow through so the equipment is maintained. So we've got a unique situation like that.

[00:10:04]

[NK]: Yeah. So, that's kind of the first field I wanted to discuss. Like your strategy for maintenance would then be the network of biomedical engineers in combination with your upheld relationships that do it? That you know what's going wrong the moment it is going wrong.

[AM]: Yes, so we maintain communications on the foundation side to troubleshoot, and then when we need a high level support or if there's a product that needs preventive maintenance, like an oxygen concentrator, then we work in with other organizations who have biomedical resources, and we partner with them to figure out solutions or to give advice. But there is not always a solution.

There is Papua New Guinea for example. That's a very difficult country. There's, say, 10 million people. I don't know if that's quite right, it could be 7m. The country is completely divided by mountain range. They're still very tribal. The health system is dysfunctional, some hospitals, the only way they're going to have equipment is an oxygen concentrator, and there is just not going to be capacity for servicing that concentrator in that hospital in that remote village. It's just not going to happen, but what we do is we check in and we invite them to ask questions.

[NK]: Uh-huh.

[AM]: And we make sure that they have an oxygen analyzer, so that they can test their equipment. So at the very least, they know whether the equipment is working correctly. If they have a problem, we get them to send photos. We come back to them so, but not all situations are like that one in Papua New Guinea. There may be situations, let's say in Malawi, that a hospital that we've dealt with, the person who was the director leaves, and then we don't get any reply emails.

[NK]: Yeah.

[AM]: Or we invite them to report back to us to keep in contact, and we never hear from them. Even though they've got our details, so sometimes it will fall through, but that is also the way in low resource settings, so you know that's the way even with the service contract. In the low resource setting, it might be broken and no one tells the people who have the service contract.

[NK]: And these things, was this always like this with the knowledge from experience from your parents over the years? That they knew there were no reverse logistics so they tried to do this partnerships early or is this something that you guys learned over the years was the best strategy to go on?

[AM]: We started the program with the understanding that we would only look at equipment that didn't need maintenance, but everything needs maintenance of course. For example, a pulse oximeter. You can say it needs maintenance, but in effect, you never see them actually go and get refurbished. They generally get replaced.

[NK]: Like equipment you can use till it's not usable anymore and then you just replace it instead of?

[AM]: In a sense, yes. So that's the same with, that's I think that there is a big challenge for pulse oximeters with the lithium ion batteries, because the whole process of replacing a lithium ion battery in a pulse oximeter is so difficult. And I don't think any of the main major manufacturers have really grappled with how to do that, and I don't think customers yet are ever doing something where they're refurbishing, so using that as an example, that might be something what we added to the range quite early.

[NK]: Uh-huh.

[AM]: Another thing, which was a key-piece now of our portfolio, was a portable ultrasound, which is a laptop style ultrasound that can be carried over the border in Myanmar to go into the ethnic minorities to do scans. It can be taken by a midwife on the back of a bike. Something that was just robust enough to go to different locations. Now for that one, the probes are likely to deteriorate after some time. And the reverse logistics with that is just simply for us and just explain our context before we get into, you know, other things. Just to say, when the probe breaks, if it's broken from overuse, then it gets replaced and we can help try to repair it, but often this is the same for many facilities, often it's because the crystals have been dislodged from, you know, being banged or whatever, and in that situation it actually doesn't make any sense to send it back to China for repairs and get it back.

[NK]: OK, so you need to be able to distinguish between it being broken but fixable and

[AM]: Yeah, and also having the understanding that like for a motherboard of an ultrasound, we do have spare motherboards that we would then send via even post sometimes works. And we post them out, or we courier them out and then we'd talk it through with the electrical engineer, because most often it's not a biomedical engineer, it's an electrician or it's some mechanic. But if it's an electrical board then we have a greater chance of success of replacing that. But if it's the ultrasound probe, if it's the wires on the probe, potentially, if you've got a good electrician and they should be able to resolve that locally, because it's just wires. If it's the crystals, no. It doesn't happen. And it wouldn't happen in most ultrasound situations, unless it's a really high end ultrasound and they have local service facility.

[00:15:53]

[NK]: Yeah OK, and so, is this something you kind of learned throughout the years through experiences you had with different kinds of materials? Which strategy would be best per material I guess then then?

[AM]: Yeah, Yeah absolutely. So for example, we don't touch anything to do with labs. We would not touch anything to do with labs. That's just ridiculous because that does not fit anything in our program, and even though we could see a great need in some of our partner locations that we could fulfill in theory. But we know that it's not sustainable for the equipment so we can't, we don't do it. We focus on what we can do well.

[NK]: I've left that part completely out of scope for my research as well, cause it's a whole other field of experience, and of medical technology. Different people, different technologies that you need for that. So I can imagine.

And ehm, yeah, I think that's everything on maintenance. I think. If you have any additions to the field of maintenance?

[AM]: Oh, OK, I did not even realize we're up to that.

[NK]: Yeah, it kind of flowed naturally. This is meant to go like this with the semi structured interviews, so it does not matter how the story goes, as long as we touch upon the points of interest.

[AM]: So, one of the strategies for the maintenance regarding our technology and how this has changed over time. It's been really difficult in the past as a foundation, like taking off the medical equipment distributor hat in a way, and talking about from our foundation point of view, we want to be able to partner to build up biomedical capacity. In many places that we partner with. But it's a really difficult thing to do. It's a little bit like saying that analogy would be that you want an obstetrician for a rural hospital in Liberia. So you'd send the doctor to the UK to get the obstetrics training they come back, and then they leave.

And so quite often, that was our experience with, that we heard about say up till 10 years ago with Biomedics as well. That you might get someone that's really good. You'd get them qualified, and then they would leave. And that's not that's of course they would. Of course they would, you know everyone has their right to go find a better professional life. And so that's been a difficulty for us, because we've often wanted to work in the biomedical space, but not understood how we could do that.

What we've done instead is to partner with an organization that is starting to hire biomedical apprentices. So essentially someone who may be a mechanic, or maybe an electrician, maybe it's just someone smart to act as the apprentice and be mentored through their network of biomedics. Now this only really works for private, not for profit organizations because it does not work in a government situation.

[NK]: No.

[AM]: So I still haven't really come to grips with what a good program could look like from a private philanthropy perspective. For a public, biomedical program.

[00:19:08]

[AM]: But we have found something that we think works really well on this other side, and so that's great because what we do now is that we try and add an apprentice into the programs for the facilities that we partner with and that means they get the mentorship of a biomedical engineer. For example, in Somaliland from what I'm told there are no biomedical engineers. There is no one formally qualified in Somaliland to do that. If they are there, they are unknown to most people, so that's one of the locations that we've suggested would work well to have this program for one of the private, not for profit, facilities.

[NK]: And then those are your partners for maintenance? Like the biomedical engineers?

[AM]: Those biomedical engineers? Yep.

One of the things for the strategy, let me get more into the maintenance strategy. WhatsApp has revolutionized some maintenance strategies, but ultrasound training as well. Midwife training on ultrasound is another side, but group messaging has really upped the game for a lot of our partners.

In Mali we did an oxygen concentrator donation where we donated to the Ministry of Health for their district hospitals. And what we also did is, we did training. A five day refresher training for the heads of the biomedical departments for each of the six regions. So we did a centralized training. The six region heads came in and then we did a five day refresher with them and then we distilled that down into a facility level. There's 50 facilities under those kind of 6 regions, where a central maintenance was then cascaded trained down so that the local janitor, engineer, whoever that was, could do the cleaning up of filters, checking of purity, checking pressure and make sure that there was no issue with the power. All of those, you know, preventive maintenance.

One of the best things out of doing this centralized training, and then the tiered training, is the WhatsApp group is still active. This is a year later. The WhatsApp group, people message: 'I've got a problem with this who can, and what do you think?' Someone takes a photo of a tube that they've got a problem with, or they take a photo of the battery they have a problem with.

[NK]: So is this WhatsApp group of like the upper tier or like with you guys?

[AM]: So it's not with us. We as a funder, we often act anonymously because we are such a small team that if everyone knew and if we got questions from everyone, we never get our work done. So it's a team group, peer to peer. And as I understand it, everyone is on the same WhatsApp group. So what I imagine is that the senior biomedes don't really look at it because there will be some who are more government, and they are more bureaucratic, and they probably don't look at that change too much that's in their WhatsApp. But I think the ones at the facility certainly would, and there will be one or two people who respond who's in between and so this is, you know, this is a wonderful outcome. That's the best outcome. Like you, I could have paid for the training, just to get the WhatsApp group, because that is the capacity building that we haven't been able to do formally through like a formal program with government, but it did come about as an offshoot of a covert program.

[NK]: It's also building with their own strengths as a unity to be able to take care of themselves.

[AM]: Yes.

[NK]: Very cool, yeah.

[AM]: It's very cool.

[NK]: Yeah.

[00:23:24]

[AM]: And so and then, on top of that, and I guess this is the other thing. I'm just kind of talking about the maintenance, the kind that it's not a revolution that's ten years old, but their ability for that these electricians are now using eBay, they're using Alibaba. They're using these platforms to order spare parts directly for themselves. The biggest barrier, of course, is that they rarely have money because it's not like the bureaucracy of a public system is going to release \$10 to Joe the maintenance guy to buy a tube to fix the oxygen concentrator even though that's exactly what they need. So there's barriers there, but there's also you can see that there, there's a great uptake of using that technology.

And the other thing that I'm noticing on the maintenance side is that there is a really nice professional kind of...

I have to say I think there's much more than five years ago. A professional awareness as professional societies of biomedics about their role and their status, their importance, and even if the hospitals haven't caught on in some cases, there's much. It's really interesting to see that to see it in LinkedIn to see it on the various, especially the technology that's being used during COVID to do digital delivery of training and it's just been really interesting to watch.

[NK]: Do you think, as far as my training part of the research. Because you have mentioned that you've done like the COVID oximetry training, okay not oximetry, but the oxygen.

[AM]: The oxygen concentrator maintenance.

[00:25:09]

[NK]: Have you done any user trainings, as to not really on the preventive maintenance side, but more on the user side?

[AM]: Or the clinical user?

[NK]: Yeah, the clinical users. So if you donate the materials that you...

[AM]: Yeah, so generally we donate, where the implementing partner can do the clinical user training. So in some instances, what that is is asked going through with them to say, OK, well, maybe we're donating directly to a facility and they say no, we know how to use this. And then we check, ok, do you know how to use it? How did it go? And that might be for one facility and for another facility they might have a biomedical engineer and we will ask them: 'Have you conducted user training?'

Have you got a quick reference card that you've designed in the right language? So that's one of the things that we find really useful with our biomedical apprenticeship partnership and one of the best things is to create user language guides.

This big [shows about a hand-wide format]

Laminate them, stick them on the equipment.

Because you're gonna have staff turnover with user training anyway. There's a lot of things, but having a quick user guide and laminated and stuck there, it's not going anywhere, it's really useful.

[NK]: Yeah, because it is mentioned quite a lot in literature that you need training for it being implemented correctly, to create a lifespan of a product that's a bit longer than what you get if you do not train your staff.

[AM]: Yes, I agree.

[NK]: But with you guys, do you always check then if the training has been done if you don't do it yourselves?

[AM]: We try it, but then it's all, it's also really hard, there's best practice and then there is just some facilities who are just too busy. They're just not going to do it. Because if you, for the biggest hospital in Malawi, in theory we could say: we want you to do training. But to do that training, we would have to pay a per diem to the nurses for them to come to the training, and then they wouldn't be doing their clinical duties anyway, while they're getting their money to learn a piece of equipment where we think they know how to use it anyway.

So there's a little bit of pragmatism that I think needs to come along with that, and I kind of say that from my perspective, of, when there's big programs, for example, through WHO, say nest360 and this is kind of, you know, I'm just using them as an example, not because it's them at all, but it's a big program. It's got funds. They are going to pay a per diem and they're gonna put that to one side, but not everyone has that money and that scope.

[NK]: Yep.

[AM]: So it's just one of those things that as a small integrated agile really interested funder, we generally got that kind of privilege to be able to say you guys need to do some user training, and you guys we think you're okay.

[NK]: This may also be the knowledge you gather over the years that you tend to know because if you do have those partnerships and speak to them quite often, you probably know the level of knowledge that's within that hospital or the equipment they've already gotten before. I can imagine, it would be. Experience gives you kind of the right to be able to say OK, maybe you should do some training and maybe you don't.

[AM]: Yeah, I mean a good example is we're ordering some equipment for a NICU in Cambodia at the moment, and we have been in partnership with that NICU and with the supplier servicing that NICU or that the suppliers in Vietnam. Actually they've got a direct relationship, but we do the funding of the equipment and we generally let them. We monitor it but if they've got problems they contact each other directly. It's fine.

They were ordering, they were starting a new satellite facility which involves 10 CPAPs, so that's quite a lot of CPAPs. So we were talking about what number of spare parts do they need to keep them going for X amount of years. And then we said to our partner, from that point on, you need to budget for your spare parts yourself, because you know the donor isn't always here. This is part of the agreement to accept a donation. This is all fine. They got that. But in the process of that, you've got the supplier saying, oh yes, you need this many. And you've got the customer over here, the NICU, saying, we want five spare oxygen sensors for each CPAP.

And then the supplier saying OK. And I'm in the middle as the fund and saying OK, that's about 10% of the whole budget. Let's just look into that. I said, is there a life span on this spare part? Now this is a bit funny, because the supplier hadn't said, oh yeah these have only a certain shelf life. Not because they did not want to, but just they forgot to. And on the other side the guys in Cambodia ofcourse were thinking we will just put it on shelf and leave it there. And I'm thinking, well, it will probably disappear and no one will find it in three years anyway. I don't know what their inventory system is like for spare parts, but you know, we've got an ongoing relationship. This isn't a usual situation, and so in the course of that we find out oh OK, well in theory.

[NK]: Yeah.

[AM]: The spare part should be from the time you open, has a lifespan of 12 to 24 months. But because there is such a high failure rate of these components, the factory opens to check that it's not faulty before they dispatch. This changes the lifespan. But it's only if you have these kinds of in depth conversations about spare part needs and you actually have a number of parties. It's not being filtered back and forth that everyone involved in the conversation is where you can get the best results.

[NK]: Uh-huh.

[AM]: And again, I would say this for an example in a very interesting example, for an oxygen plant repair program in Malawi. So, an oxygen plant was broken. *[organization 01]* funded a program that looked at all of the oxygen plants in Malawi and assessed them, physically assessed them. A biomedical engineer went in and said this is working. This is working, but it's gonna break soon. This is what needs to be done. They did a national report. We then offered to fund the repairs for one plant. It turned out someone else had funded the repairs. That's great, but they did not know anything about that. They don't work in oxygen or in biomedical things, so they funded the amount and then it's done.

But the communication fell through between the Ministry of Health got the funder over here to do the funding and then the Ministry of Health said right. I guess that's done, and the founder said, I guess that's done. When we went there, it wasn't done. There were extra things that had not been identified earlier that had broken and were gonna cause the plant to malfunction, but it was very difficult to get that to go back here, because the supplier who's just done the work was only briefed on a certain amount, and so the only way to resolve that. I know this is not sexy, it's not what you are looking for, but the best way to resolve it is classic communication and have a phone call. We had a phone call with ten stakeholders, so it did mean 2:00am for someone in Sydney.

[NK]: Yeah.

[AM]: Most people don't live in Sydney, so it's fine. And we had invited the Ministry of Health but they did not come. We invited the other funder, the supplier, a biomedical consultant and then we invited someone who has local experience, who has practical understanding, that's grass roots. And then we invited the engineer from the hospital and jumped on the phone and we said what is happening? What's the problem? Where are we at? Who's supposed to do what? Who's gonna fund it?

Now the funding thing that's a bit easy to call the meeting like that if you are the funder, it's much harder to do when anyone else is. A biomedical engineer should be able to do that. That's what a biomedical engineer should have been empowered to do. And so we're just stepping in for the biomedical engineer, because they don't have the respect and the network that we do.

[NK]: Yeah, but I think it's a good example. It gives kind of a clear picture of how things... But it's always things you read about it in literature that it goes wrong or why, but it doesn't necessarily specify where or how or...

[AM]: No, and this is really interesting, that the supplier who a lot of people beat up on medical equipment suppliers because of, you know they. They're not doing their service contract or they did not fix it when they were paid to fix it. And that wasn't true in this case. They did exactly the repairs that were specified. They reported the day they got there. They found more and this is what it would cost to do it. They keep following up, they're the only ones in this whole group that are ethical for profit. And if I can get say one thing for you to say in your thesis:

Ethical for profits are so much more effective than not for profits.

[NK]: I think that's a good thing. The company I work for is going to be for profit. I think most companies to be included are going to be for profit.

[AM]: [Company 02] is the best example of an ethical for profit.

[NK]: I'm very looking forward to talking with [Company 02]. I'm going to talk to [TJ] at 1:30, so in a few hours.

[AM]: Oh, you have not talked to him yet. He is a very good person, and this is one of the things so you know the bureaucracy of not for profit world can impede efficiency and effectiveness of not for profits who are working across medical equipment. It's just a design flaw.

[00:35:44]

[NK]: OK, so to touch upon the last subject I wanted to talk about. The organizational change, which is quite a broad subject in a sense that I wanted to find out how companies, if their product really tries to change behavior or really has a big impact on a hospital how that would work. I think maybe this is the medical equipment side you're on, is not really on behavior changes. But I heard you talk about consumables, and spare parts we have touched upon already. But consumables I have read it might be a problem.

[AM]: Uh-huh.

[NK]: Because, in the western world, like in high-income countries, you know that every patient gets their own consumables which is not the case for Africa, because it would be very high cost to have everyone have their own consumables. So how do you handle that?

[AM]: So there are formulas that you can use to disinfect nasal cannulas if you have access to the bleach and you have the formula, there are three different recipes. One is cornstarch, one gum starch, and one is something else to make your own ultrasound gel. If you're in a situation where you're using so much of it that it's cost prohibitive or you're in a situation that you just can't access it.

All of these solutions are great, if you've got the resources, the human resources, to actually innovate to do that. And that's really a difficult thing because a lot of resource poor settings also have poor education. And don't you know, problem solving is not necessarily something that comes as second nature. They're taught didactically. So it's a difficult thing so that's not always going to be the case that they can use these, but they're things that, for example, there's ways to get around the consumables.

The other way to get that. What we find really important is that, for example, we would never partner with the laboratory equipment, where there is no local consumable available. So that would limit then to only getting someone who's like local service supply and that jacks the price up. Which is unfortunate, so I bet our outlet vice with those partners is that you have to pay that price. You can't have a piece of equipment that does not work, because you may as well have no equipment.

So you know we find it, another way, or outsource your labs.

[NK]: Yeah, cause do you work with them? Because I think for some machines like the sensors and stuff are also part of the consumables and maybe not the sensors with right? Like if I get an ECG machines the stickers and.

[AM]: Yeah, the ECG, that's one. That's an interesting one for us. We have access to a really robust patient monitor that uses the ECG leads and there is a way that you can add on suction. You

know the round suction clamps and to have them function with the machine, but it then doesn't give you the heart rate I think it is. Because on most of these patient monitors.

Let me get this right, there's the heart rate and the pulse rate. And so the pulse rate will come from the fingertip oximeter. Though the SPO2 that will come from here, but the heart rate will come from the ECG. I don't know how it works in practice, so what we've found is that the question that we ask any facility that says we need a 6 parameter patient monitor is what is your supply chain availability for the disposable electrodes. If you don't have disposable electrodes, you do not need this because you're not going to use that parameter and the other parameter. There's two parameters that go off the ECG electrodes and the third parameter is a thermometer, and you don't need a thermometer because you've got a mercury thermometer and you don't need an electrical thermometer on here that needs a disposable tip when you've got a solution that's more practical in a resource poor setting.

[NK]: So it's partly just analyzing what they need before they... yeah.

[AM]: Yeah, and that's something that would be great for, and I think that most you know, most people designing for resource poor settings are asking that question, asking those questions. I don't think I've come across anyone that is not asking, trying to find out before they give equipment whether it suits the context who are designing for context.

[NK]: Right, yeah. No...

[AM]: Well except for GE and the VE scan, The GE ultrasound scan was terrible.

[NK]: I don't know if I have heard about that, but I think ultrasound is a big thing right now.

[AM]: Yeah we're working on a couple of really great ultrasound programs that we are super excited about, which is essentially task shifting. The same with biomed, you know, and that analogy with the obstetrician, you won't have enough radiologists to perform the level of scans that are mandated in most countries. So what you can do and what we're working on with the university of Malawi, actually the Kamuzu college of nursing who are part of the university of Malawi is for their midwives. They are being trained in how to use an ultrasound. They are not going to be radiologists. They do not diagnose, but what they can do is say, your placenta is there or not. Plus, is it placenta previa or is it at the back? Yes, no, refer.

[NK]: No, yeah.

[AM]: And it's just six questions. Yes, no, refer. And they can't do anything beyond that. And then what it means is that the referrals that are going to the facility are more likely to be high risk. So it won't lessen the radiologists workload at all. Because the workload will still be there, but it will mean that the people coming to their radiologists are more likely to be high risk.

[NK]: I've read about that, cool.

[AM]: I'm glad you've read about that, because that's very new and we started the program.

[NK]: Yeah, the task shifting part, not necessarily midwife and task shifting. But task shifting using ultrasound.

[AM]: Ah that is so cool, can you send it to me?

[NK]: Yes, I can try to find it in my literature review somewhere.

[AM]: It's really hard isn't it? I'm sure it's somewhere.

[NK]: No, I think it's in my included articles somewhere.

[00:42:43]

[NK]: I think one overarching question for me is, I've chosen the fields of like maintenance, training and organizational changes. Because, when looking at some implementation frameworks and looking at high resource versus low resource these were three fields that seem to be jumping out as being problem fields some of the times.

And do you think, there's an overarching kind of way they connect, in your opinion?

[AM]: You just lost me just a little bit, can you go through that again?

[NK]: Yeah, like the training, maintenance, and organizational side of things.

[AM]: Well, it's all interconnected. I mean, and it's yeah the biomed that should be in touch with clinicians. So it's a biomed should be involved in the lifespan of the equipment and they should be ensuring that that works and updating user training and responsive to the users.

And the users should be, seeing the biomed also as care provider. And so that's why I see that they're very integrated and that's the other thing to see the tool as well as helping to provide care.

[NK]: Uh-huh.

[AM]: So I think that's, uh, and then the organizational side is just a little bit harder because it's harder to kind of, you know, the difference between low resource and different countries and private not for profit, public.

There's so much. We work in such a big kind of footprint that it's too hard to kind of make comment on that.

[NK]: I can imagine, because I think, that would be more of a question for companies themselves. Because it is a thing that they should in theory integrate into their strategies. How they would do their consumables, and do spare parts as a company, rather than it comes of course for every hospital, every district, every type of hospital you come across it's probably different. Every country is different, because the way I have heard already from the company I work at currently that every country they visit to do like a hospital scan to see the status of needs in every hospital. It depends really if it is private or public, or anything.

[AM]: Have you looked at lifebox, the organization?

[NK]: No.

[AM]: So that's really the organizational changes you talked about. How does your product influence the daily practices of hospital staff? Like life box essentially was founded, it's a foundation, but also a medical equipment company.

Have you read the safe surgery checklist or have you heard of that? I can't remember the person who did it, but so the safe surgery checklist is the checklist for surgical staff and any suggested go through and say hey, we got these five things.

[NK]: Uh-huh. No.

[AM]: Before we start surgery, it's like the airplane checklist. Let's just go through our checklist. That off the back of the person who wrote the checklists, they started a foundation because pulse oximetry was something that was really missing from a lot of places in Africa, especially, so they started a foundation that procures suitable handheld pulse oximeters for surgery.

But part of what they, their whole reason for being is to implement the safe surgical checklist. So when you talk about organizational change, life box is are really interesting hybrid of an organization that needs to push safe surgery through organizational change, but they you utilizing a medical device to do it?

[on contact information]

[00:47:35]

[AM]: They've now started a program which is not to do with a medical device, but it's called clean cuts. But that's on their foundation side, so I probably wouldn't go into that. But if you look at what they've done with the pulse oximeter to push a hospital, changing the surgeries by using the checklist, it's really interesting. It's one of the best out there.

[NK]: Like the first thing they say is also like a learning platform, which is also very interesting.

[more contact information]

[00:49:46]

[AM]: The brilliance phototherapy lamp. They design it, and then they partner with someone to outsource it. They are at the cutting edge of kind of ethical...

[more on getting into touch with companies]

[AM]: I'm not really sure where they were at. It's not really a thing that the *[organization 01]* does. We're not interested in newly innovative products where it requires an overlay, especially tablets. Our experience of tablet devices, this includes the butterfly ultrasound, which I'm not sure you've seen, but you can look at that. It's much, even though the butterfly ultrasound is the same cost as the ultrasounds we purchased, and it's superior quality, we would not get that.

We would not get that because it needs to interface with a smart device and when you start interfacing with smart devices in a busy hospital it falls apart. Whose device is it gonna be? Is it gonna belong to the hospital? Is it gonna get broken? Who's gonna do the software updates? Every trial that we've done with that technology in our busy large hospitals, let's say public or private non for profit is different, but it doesn't work.

[NK]: So that is very interesting because that's the goal of the company that I do my internship at, they want to interface with a tablet. They've got the goal of tablets interfacing and making it possible to do more with less doctors.

[AM]: Yeah, and that's the way of the, that's the way of the future for sure. That's where you want to design, 'cause that's where will be. But for us, we're not going to fund that, for example, as what we do right now, because it needs to be trialed. It needs to be tested. There needs to be. People get need to get used to it, and so what we'll do in the meantime is make sure that the and this comes full circle back to what we first discuss. We're not going to train the users on how to use a tablet for a piece of equipment if they know how to use it without a tablet.

And then because that's where we say, well, if we don't need to do the user training and that solves that problem and makes them more efficient right now, that's where we're at.

[00:55:19]

[NK]: Very cool yeah. Well, it was very informative talking to you.

[AM]: OK, sorry, I'm just full of opinions.

[NK]: No, that's great. I think that's your prerogative. If like you, you have experience in this field. I do not. So I think everything is interesting.

[AM]: OK, well I welcome any questions. So yeah, good luck with everything.

[NK]: I'll try to find the article and I'll send it to you and I'll send you the transcript as soon as I've anonymized them, because then you can check if they are anonymized enough.

[AM]: Yeah that'll be great. OK, thank you.

[NK]: Yeah, thanks.

[AM]: Ok, lovely to meet you.

[NK]: Yeah, bye bye.

[00:55:56]