

## Interview with Organization 04

*This transcript has been anonymized to not have the organization 04 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: Rik Johnsen [RJ]

7/12/2021, Microsoft Teams, 18.00

[NK]: Okay, I might have to change the language, or no. OK, How are you doing today?

[RJ]: Doing well, thanks. How about you?

[NK]: Yeah, good. It's already dark here. This is the end of the day for me, but.

[RJ]: Right?

[NK]: It's nice that you could have a talk with me.

[RJ]: Yeah, definitely happy to do it.

[NK]: Yeah, and I think I sent you the interview protocol as well.

[RJ]: Yes.

[NK]: Yeah, so that's just depicts the main topics we're going to talk about today. Uh, so I wanted to walk through the like the general profile and information.

[RJ]: Great.

[NK]: Just to give me a reference frame on how to interpret all the answers I get from the different kinds of companies that I interview.

[RJ]: OK.

[NK]: Because did you read it by any chance? Like the profile? Yeah yeah yeah.

[RJ]: I skimmed through it. I did read it. Not in depth.

[NK]: Yeah, no, that's OK. That's OK. Uhm, because we walked through the medical technology. You currently have like the CPAP and the ventilators?

[RJ]: Correct?

[NK]: And then you do both neonatal and adult ventilators?

[RJ]: Yes.

[NK]: So that's [neonatal product] and [adult product], and I think the CPAP is that also for both as well, or is the CPAP only for neonatals?

[RJ]: It's for both yeah.

[NK]: Right, and then, the intended users. Are those both doctors and nurses, or does it really not matter to you guys or?

[RJ]: It does. It would be doctors, nurses and then a more limited usage of the equipment with midwives and community healthworkers. So we would not train a midwife or community health worker to do some more advanced things that you can do with the ventilators because they need other training to be able to do this, the training that we would provide. Do you know what intubation is?

[NK]: Yeah.

[RJ]: Yeah, so we would not train a midwife or a community health worker on intubation, but we would a doctor or a nurse.

[NK]: Yeah, and then, uh, I couldn't really depict in how many countries you are currently active. Because I saw a project don't Cambodia and cut projects for Madagascar I think, but I don't know if you're already ....

[RJ]: So we have done equipment and training in Cambodia and Zambia and Madagascar. We have equipment in or almost in Uganda, Zimbabwe and Mozambique. But we have not yet done training because of customs and COVID and all that good stuff.

[NK]: Yeah, I can imagine, yeah. And then you were founded in 2016.

[RJ]: Yep, yes.

[NK]: That's correct. And I could find on your website that there's 9 persons active in [organization 04] itself. Or is it more?

[RJ]: Yeah, so there are simply varying degrees. There are full time, part time and volunteers. And there's about 9 of us active in those capacities.

[NK]: And yeah, I have here number of offices, but I think you guys might have 1?

[RJ]: Just one, that's right.

[NK]: Yeah just one. And I couldn't find anything on your revenue. I don't know if you have revenue already?

[RJ]: Uh, so we do. We've not yet filed are 990 for the year that our revenue is going to be, I would say we're gonna do probably around 1,000,000 for the year in product sales and donations and grants, product sales, donations and grants around 1,000,000.

[NK]: Then if yeah, your role is to vice President of growth and partnerships.

[RJ]: Yeah.

[NK]: That's right, yeah. And then, uh, just for my kind of frame of knowledge. And what's your experience like in the field of low resource settings specifically?

[RJ]: Yeah, so I've been working in Africa for a little over 15 years now. Uh, so I've lived and worked in DR Congo and Ghana, so I lived in both of those countries. And then I've worked in various countries, many countries throughout Africa, West East and South Southern Africa. I've also done some work in China, but that was years ago and I wouldn't really call that a low resource setting anymore, so.

[NK]: Yeah, it's a different, maybe a little bit difficult to scale, China is so big and I think it has very different levels of resource throughout the country.

[RJ]: Yeah, yeah exactly. They were really poor areas of China. But yeah, mostly Africa for me.

[00:05:15]

[NK]: Yeah, and if you would like you, can you maybe introduce [organization 04] for me in like 5 minutes or something? Just about what you do and your goals and your...

[RJ]: So every year there are about 1,000,000 newborns that are born, struggling to breathe. For various reasons and.. That those million newborns, these particular newborns die every year, so about a million deaths from what's called birth asphyxia. And about 95% of those are preventable. If you have a ventilator, CPAP and training to be able to use the ventilator and CPAP. And obviously the equipment has to be in the right places as well. If you have all your ventilators in one hospital, and newborns are being born out in country hospitals, then it's not going to do them any good, so. So that's what our focus is on, is addressing that particular need. Most of these deaths occur in low resource countries.

And if you look at infant mortality rates from, or even neonatal birth asphyxia rates in Africa versus Holland or Netherlands or versus the United States, we still have babies born with birth asphyxia we're not immune to that, but we have fewer born for various reasons, and those that die from birth asphyxia, the rate is extremely low in the United States and in Europe.

[NK]: Yeah.

[RJ]: Uh, and that's not the case in Africa and other developing markets. So that's our focus when we look at the markets, there is not a problem with the technology as far as, ventilators don't exist. They do exist, but if you go to a lot of these low resource settings, you'll see the hospitals have ventilators and, the statistics change and vary that I've seen, upwards of 70% of all medical devices in low resource settings are not used. Either they're broken or there you know they can't get training to be able to know how to use the equipment. So these are some of the core issues that we focus on, but our focus specifically is around birth asphyxia in newborns.

And so we look at OK. Well, we know we need to build a ventilator that is fit for purpose. One that is easy to use, affordable and easy to maintain. So if it does break down and it's easy to repair with a local technician. So, our ventilators were designed with that specific use case.

And then we know that there, it's not enough to develop the technology you have to train the doctors and health care workers on respiratory therapy specifically for neonatal, which is different from respiratory therapy for an adult. So we have a team and a program, a training protocol that we implement whenever we are delivering these ventilators, or when we're partnering with governments and nonprofits to work on reduction of neonatal mortality. So that's our intervention, its technology, its training, and it's getting both of those in the right places as well.

[NK]: Do you guys do training for these kinds of materials, but not with your own equipment.

[RJ]: We do, and so I'm actually talking with an organization right now in Pakistan, called Aga Khan and that is one of the things that they're wanting. They want to purchase some of our ventilators, but a lot of the locations already have ventilators and we're happy to go in and train their teams on anyone's ventilator. We don't care.

[NK]: That's cool, yeah.

[RJ]: Yeah.

[NK]: Okay thanks, yeah 'cause yeah, it's basically touching upon the points why I'm doing the research as well like the 70% mark and also just the maintenance and the training that it's that it's important.

[RJ]: Yes, yeah.

[00:09:31]

[NK]: So it's interesting for me because yeah, the first area that I wanted to discuss is the maintenance of the products. And as you stated you tried, you've tried to design your product is being easy to maintain, but is that is that your whole strategy or what? What is your strategy surrounding the whole field of maintenance, and how did you guys decide that that was going to be the way to go?

[RJ]: Yeah, uhm, one of the biggest things that we've seen in the marketplace is medical devices are designed with a user in the US or, developed countries if you will, Europe, US or Japan wherever with them in mind. And so this idea that you have doctors that are highly trained. In fact, in most of these areas you actually have respiratory therapists that that's their only job. They're just respiratory therapists, and so they can become well versed, well knowledged in these higher end ventilators which I should add we love. We think the ventilators are great we have no problem with the with these high end ventilators.

The problem that arises is the use case changes when you get into, we'll just speak Zambia for right now, so in Zambia they do not have dedicated respiratory therapists. They have doctors and they have nurses. And NICU nurses are also rare. They do have them, but that's not as common either to have a NICU nurse and so. So you're already dealing in an environment where your hospital staff. Are not as highly trained and they are more generalists rather than specialists.

[NK]: Yep.

[RJ]: K, so you have you have a really good ventilator that's been designed for a specialist and you can finetune them. You can have all kinds of sensors and these are wonderful things. We love them. I'm glad I have them in my hospital down the road.

OK, uhm, but when you're working in an environment where you don't have specialists, you have generalists. They don't have the time to become an expert at all the latest bells and whistles and buttons and touch screens on every new medical device coming in the door. And use something that's easy. That's quick, easy to use.

[NK]: Uh-huh.

[RJ]: And so we use that design philosophy when we designed our ventilators, something that could be used by a just a general nurse or even a midwife or community health work even. There aren't... Imagine you go into a rural hospital or rural clinic in Zambia and all you have is a midwife or a nurse that's manning that hospital and there's a mother giving birth and the baby is born with breathing problems. Well, if there's this really fancy ventilator there that no one knows how to use.

[NK]: Yeah.

[RJ]: You know that's not gonna do anyone any good, but if there's a ventilator there that just has some knobs that you turn with numbers and dials, you know there's no computer interface, it's just knobs and dials that's much easier to use and to train on. So that's the design philosophy.

[NK]: And yeah, but for maintenance I know from experience that easy to use is not necessarily always easy to maintain in like the technical sense of the word.

[RJ]: Right? Yep.

[00:13:02]

[NK]: So then, did you guys also make it very robust in the sense that it would also be easy to perform maintenance on or?

[RJ]: Yeah, absolutely. So again, if you look at a lot of ventilators, what they'll have is that they will have the really big touchscreen, a really big LCD touchscreen. Uh, and it's interesting because when you talk about something that's easy to use, well, easy to use for which culture? Because a touch screen is very familiar to you and I, we have our smartphones and we're very familiar with this type of interface. If I'm dealing with a midwife in rural Zambia who has a flip phone.

[NK]: Uh-huh.

[RJ]: And maybe she's not as familiar with smartphones than a touch screen interface is going to be incomprehensible. K, so it's really important that we define easy to use based on well, who is the user. And so our use case was very much designed around. Well, we want ours to be not only easy to use in a hospital, in an urban area, but also easy to use for a midwife out in rural area who may not be familiar with a high end touchscreen interface.

Uh, so that's one aspect. So when we talk about maintenance. If you look at an interface with a touch screen, what you'll see is a lot of software involved. And a lot of what are called PCB boards, basically just computer boards inside OK.

[NK]: Yeah.

[RJ]: If the software is not working, that's really difficult to fix, or you know you can't easily train a local technician in a rural hospital on software maintenance. So you usually have to have some expert trained in the capital city, which is expensive. They've got to then travel out and you know all of a sudden it costs start adding on. OK, so software is actually a problem.

When you get down to these places, the other issue around that is these PCB boards. They're great in that they allow all this functionality, which is wonderful, but if a PCB board isn't working, you can't just replace a piece of the PCB board, you've got to pull the whole PCB board out and stick a new one in.

That requires a high level technician, a specialized technician, to be able to do that. OK, so we designed ours saying we're not going to use big touch screens and we're not going to use a lot of software, and we're not gonna use PCB boards as our main component within the ventilator. So if you open up our ventilator, what you see inside is a bunch of knobs, a bunch of tubes you see a lot of mechanical devices that are in there, so physical devices that are making the ventilation and the CPAP work.

Uh, you know we use pressure gauges rather than a digital pressure gauge. We have an actual pressure gauge with an analog control on it. Yeah, so the design philosophy there is it's componentized so if a component breaks I can just ship you a new component and a local technician could crack open the case, pull the component out and stick a new one in, attach it and away you go.

[00:16:28]

[NK]: And what is your experience with that strategy? Been like in the time that your product has been running.

[RJ]: Yeah, so it's been running for a little over a year now and we don't know 'cause we never had any break yet. Uh, we assume that's going to be common because we're dealing with physical components that are high... They're developed, we call them automobile standards in the United States. It just means it's a high level of precision on the components, and so they're designed to last for 10 plus years. So we don't expect them to break for at least five years were assuming we hope they'll go 10 years, yeah.

[NK]: You never know. Yeah true, cause did you do any? Did you say that like they should be replaceable by a local technician? And have you done any research into like local, like the level of knowledge that these local technicians have and if they would actually have the skills to do this?

[RJ]: Yeah, so I haven't, we haven't done specific research with [organization 04], but my experience in the last 15 years in Africa I worked with a lot of local technicians on the power and battery side. That's really where a lot of my focus has been. So I interacted with a lot of technicians in multiple countries. I've never found it difficult to find a technician who could easily find their way around, you know, a device like a ventilator. There are some really savvy local guys that just.

[NK]: So yeah, I've heard.

[RJ]: Yeah, the culture is very do it yourself and so.

[NK]: Yeah, I know, yeah.

[RJ]: You know, we really have built this to a level where if we can find one of these local engineer kind of do-it-yourself engineers, they'll be able to fix the ventilator and we do that when we go into a country and work with a partner. Part of our training is actually training up a local technician on how to maintain the ventilators.

[NK]: Yeah, because I can imagine that it does take some preventive maintenance as well. Or does it? Did you design it to...

[RJ]: Yeah, no, it's the only component that's gonna break, that's gonna stop working, there's a battery pack inside of them. So they can be run without electricity, you know, source to mains. Those batteries will definitely die out within about four to five years. That's just the lifespan of a battery these days and so. That piece we know will need to be replaced in about four to five years.

[00:19:18]

[NK]: Yeah and then now. Yeah, it sounds sounds good. I have some. It sounds good yeah? And then because to be able to make an estimate of how long something will work over there, is

it that you estimated it on the basis of knowledge that you gained in the US? Or did you do like some ground testing there to see if it?

[RJ]: Yeah, so you know, we haven't been ground testing just because we haven't had, you know.

[NK]: Yeah, you don't have the time. Yeah, you haven't had the time span. Yeah, yeah.

[RJ]: We haven't had the time. But from experience you know this is very anecdotal. There's no study around this, but having worked with electronics, building batteries, building solar solutions, in Africa for 15 years, everything breaks in Africa. I don't care what it is, it will break. And so, we hope our devices go 10 years. I don't know why they wouldn't. We've designed them so they would, but I'm not going to be shocked if in four years I get a call saying some part broke.

Just the way they're used. They're used with poor electricity, humidity fluctuations, sand in certain areas, dirt in certain areas, our ventilators are portable. Most ventilators if you look at a US situation, it's on a cart and it stays in the hospital and it goes between maybe a couple rooms on one floor, maybe two floors. In Africa we can imagine these are going to be picked up. They're going to be carried to another hospital. They're going to be in cars on back of motorcycles, being jarred and bumped around, you know?

[NK]: Yeah.

[RJ]: There's only so much we can do, in those use cases.

[NK]: Yeah true yeah. I can totally imagine. Uhm because, now I'm like, uh, I'm very interested in seeing what would happen with you guys the next four years, what you will see. Because I've heard stories already from previous interviews stating that people try to maintain their materials by maybe ordering some spare parts online at like Alibaba and then just trying to fix things themselves.

[RJ]: Right? Absolutely.

[NK]: You're probably gonna come across a multitude of those things.

[RJ]: Oh yeah.

[00:21:29]

[NK]: Is it, uh, just because you stated in a little bit on that you train, but you do train someone like a technician or something specifically for the maintenance part?

[RJ]: We do.

Yeah, so we partner closely with the Ministry of Health and with a local NGO that has staff on the ground. So if a ventilator breaks then we have a local technician usually in the capital city who either can go and fix it or can get on the phone with you know their local repairment if it's if it's way out in rural Zambia somewhere then our local guy, in Lusaka the capital, can get on the phone with a local technician there and walk them through it.

The equipment is not complicated, so they're easy to figure out. Oh, there's something called the solenoid, for example, you can hear the solenoid clicking. If it stops working, you know the solenoids not working and it's not going to be hard for someone to talk them through. OK, unscrew these 4 screws, pull that out, put a new one in, plug the two things in, and there you go. You know it. It's designed to be that easy to fix.

[NK]: Uh-huh. Yeah. And is that a technician? That's also good. You say it's portable, but does it need to be installed then at the at the location? Or is it just facts and ready to go when you send it out from...

[RJ]: You know it's ready to go, you just plug it in and start going. Yep.

[NK]: And do you? Do you produce it in the US or in?

[RJ]: Yes, it's manufactured in the United States.

[NK]: Okay I think that's it on maintenance. Maybe if you have anything left to say? I mean, since I don't know.

[RJ]: So we definitely are looking at some software solutions that that there's a company out of Alaska called 60 Hertz, and they're focused on designing a smartphone application that can be used to track all products in a country... ehm, alert users on, you know even how to use the products, maybe a checklist that they could go through when they're when they're using it for the first time or each time, maintenance schedules, if there are any. So we're looking at software solutions like that as well, and my guess is we probably we'll something out like that next year or the year after.

Once we have an installation in Zambia of you know hundreds of units then I think it makes sense for us to start looking at a software solution for us, The Ministry of Health and the local NGOs to monitor all that equipment and do maintenance. I think software solutions like that could be really big for Africa. No one is really doing that on a on a countrywide scale. I mean imagine if you are the Ministry of Health and you're wanting to track all medical devices, so not just ventilators but everything you have in all of your hospitals.

[NK]: So I think that would be very difficult.

[RJ]: Yeah, It's a nightmare right now and so having a software solution like this could be a, I think a real game changer and not only save them money because you'd be able to set up maintenance schedules and make sure your equipment is being maintained on schedule, but save lives because you'll know, oh, this piece isn't working. We need to get a new ventilator out to this hospital in this district.

[NK]: Yeah, sounds like a dream that yeah.

[RJ]: Yeah, so that's where we're moving too, but we're not there yet.

[NK]: Because that would be then for maybe not necessarily preventive maintenance, but just for checking in every couple of, I think months, I don't know ,years, just to see if everything is correctly working just to prevent it from breaking basically right.

[RJ]: Yeah.

Exactly, and the nice thing is, is this software dashboard ties back to us the manufacturer so we can see what's going on with all of our ventilators and we can be proactive about that, and so imagine if Zambia the government of Zambia, had this dashboard of all their medical devices and then all the manufacturers that they purchased from have access to this and could be proactive as well. I think, I think that's a game changer. I hope 60 Hertz is is able to partner with these organizations to make that happen.



[NK]: I hope they would. That would be very cool to see, but I can also imagine that the hospital itself doesn't really know even what kind of materials they have in house. Like, uh, exactly every model or every make or everything that they have. I don't know. That would be quite an inventory thing to do for a whole country as well.

[00:26:22]

[NK]: And then I think moving on to training because besides the technician you have the end user like the doctors, nurses, midwives and everyone that basically comes in touch with your... Uh device and, what what's your strategy on that and why basically?

[RJ]: Yeah, so we do. We use a train the trainer model. And it stands anywhere from eight months to 18 months. It depends on how many people we're training how many locations. So, the fundamental model is once the ventilators are in place, we have a team of respiratory therapists that we fly in-country and we go to a central location. The doctors and nurses and midwives and whoever they come to that central location. We work with the local NGO partner who knows the Ministry of Health as well. So we work with both the Ministry of Health and the local NGO partner who have relationships with these hospital systems. They, from those hospital systems say OK, well, we know where the needs are. We know where these ventilators need to go. And so what we're going to do is we're going to, theoretically, we're going to take one or two people from those locations, and they're going to become our master trainers.

[NK]: Uh-huh.

[RJ]: So they are going to come into the capital city, for example, the central location. We come in and we work with these master trainers and we train them not only on how to use our ventilators but also general respiratory therapy. So there are protocols you can do without a ventilator that they should know how to do. And so we teach a full comprehensive respiratory therapy program.

[NK]: Yeah.

[RJ]: We do that over a couple of days. And then they go back out and the idea is that they have a staff of nurses and midwives that they're working with. They are then going to share that training with this group. That's the idea. What we found is it takes usually three in person visits. And we also do virtual training as well. So in between our in-person visits we have virtual training that we'll do with anyone these master trainers or with their staff. Uh, and then we are currently developing a series of videos. We have some videos right now but we're expanding on them.

[NK]: Yeah.

[RJ]: And so that's kind of our asynchronous training that anyone can watch the videos at any time they're broken up by topic. So if you wanna know how do I wean someone off ventilation? Well, there's a video on weaning off ventilation and they can watch that and remember, oh yeah, these are the things I do, these are the settings that I use, what I'm looking for and then they can remember how to do that. So our first training is kind of train the master trainers.

[NK]: Uh-huh, yeah.

[RJ]: The second training is a couple of months later, we then work with the master trainers to reinforce their training of their local staff, and so that's usually us going out to some of these rural areas or district areas. Basically into the hospitals and working with the trainers and just supporting them. And then the final training is it's a much shorter and it's really just us doing a lot of data gathering. Uh, answering final questions. You know, there's usually, you know you can imagine during a an 8 month to 18 month implementation, people come and go.

And so sometimes there's new people that have come in that, maybe a master trainer even has left, so we need to get a new master trainer going, so we'll do that. But that's kind of the idea. The idea is we want to create this core group of master trainers that that really can handle it all without us.

[NK]: So you deemed those trainers kind of able to keep the program going after those 18 or something months.

[RJ]: Yeah, 8 to 18 months getting on how big the country is. How many people we're training? How many hospitals, how many master trainers we'll need to go through. So usually three visits. Uh, but by the last visit it's really just a, it's really just a finalized visit. Usually the 1st 2 inside the ones where we've really done most of the training.

[00:30:55]

[NK]: Yeah, because, uh, how did? How did you guys decide on doing those trainer on trainer models that if that was the way as you wanted to...

[RJ]: Because. Come just from experience what tends to happen is you'll go in and train a group or people and they leave, so they're no longer at that hospital anymore. And all of a sudden the person that knows how to do respiratory therapy is gone. And now the hospitals in the same effect or state it was before. So we knew we had to, we had to inculcate, uh a knowledge within the healthcare system of the country rather than us being required to constantly come back and train people again and again and again.

[NK]: So do you guys only then take projects from like a whole government so that you take projects that are mainly from a country itself or also... loose projects for maybe clinics or.

[RJ]: Our preferred is to do a broader scope where we're working with the Ministry of Health, but we will train anyone. So there's a smaller NGO group in Sierra Leone that we're talking with and they basically have three hospitals. That's fine, we will just go in and train the three hospitals. You know, we're happy to start wherever we can.

[NK]: Is it then still the trainer on trainer model? Or do you guys then choose to do each hospital individually?

[RJ]: No, so we'll do a trainer on trainer and it might be that we only have to go twice because it's so small.

[NK]: Yeah, and I think... You said that do you do some online training as well and is that then just like a zoom call to... uh, teach them, maybe not on the but is that both, both user training on like the actual use of your products or mainly just kind of lecture-like.

[RJ]: Nope, we will do virtual hands on training with our product, so we had to do this for Madagascar because they closed their borders and we could not get our team in. So we have our ventilators sitting right here and we show them this knob and we have an interpreter on

their end and you know, speaking their language and you know, pointing it to the knob on their side.

[NK]: Yeah, cool, yeah.

[RJ]: It's not... I'll be honest, it's not ideal. The ideal is to be in person. It's much more efficient. And we're able to really create a repour, and to answer, I think more in depth questions. A virtual training works, but it's not ideal.

[NK]: And then, as far as any accreditation after completion of training? Or is it just that, anyone is deemed fit?

[RJ]: We, yeah we certify them. But it's not a recognized certification, so it's our own internal certification. That says, hey, we know this group of 13 doctors have gone through our program and so we as a company have certified them as a manufacturer, yeah?

[NK]: OK, yeah, so it's not really a certification that they keep in mind when...

[RJ]: No, but the government can use it as far as saying OK, well, we know these are master trainers and we know they've completed all the steps that *[organization 04]* has implemented and trained on, and so it's good knowledge for them if they need to send a trainer somewhere they know those people that have gone through the program.

[NK]: Yeah, and is it then contractually so that after the project is done so after you've been there a third time, that if they maybe ask you in a year or in it... if they ask for refresher training, do you guys provide that? Or is it actually not really the...

[RJ]: Nope, we will go back as often as they want us to, uh, the difference would be would need them to pay for it at that point. So all the training that's happening during our initial implementation is all free. We just covered that. It's not free, that's the wrong word. It's covered by donors.

[NK]: Yeah, yeah, it's it's paid for by somebody. So yeah, OK. And and.

[RJ]: Yeah, that's right.

[NK]: So, and you've done this training in Madagascar, Zambia and Cambodia then? Okay cool.

[RJ]: Yes.

[00:35:28]

[NK]: Uhm, do you think? Is there anything that has happened on this on these trainings... uhm, Like the ones that you have completed by now, that have changed the following ones or have already changed your course a little bit.

[RJ]: Definitely yeah. Yeah, we always evolve every time we go. We figure out how to do something better or differently, you know.

[NK]: Yeah, do you maybe have any examples of that? Like things that have affected your strategy when actually doing your first training? Or like your second training?

[RJ]: Uh, in Cambodia we had large group sizes and that didn't work out well. And so we learned from that saying, OK... let me put it this way. It did work out, but it was not ideal because it ended up taking a lot longer than it needed to. And so what we realized is. We started realizing how many people we can train per number of trainers that we send.

And so if they have more that they need training, we either stay longer and we know that from the outset and we break the groups up into different sizes. Or we just come out multiple times. If we can't do it all at once. So that was one learning. So just the size of their courses and then the attendees.

[NK]: Yeah.

[RJ]: The other learning was we've really had to tailor our training towards the knowledge of the attendees. And so, before we were just trying to communicate to the Ministry of Health, to say, hey, you know, let us know who the people are. And it just wasn't working and so now what we do is we actually send out before we even come into the country, we require that we know who the people are coming to the training. What knowledge level they have and we actually send out now, it's kind of a mini quiz to assess their knowledge levels on different topics that we would be training on. So now when we show up, we have a better idea of, OK, this group of people we might break off and we're going to spend extra time with them because maybe they don't know anything about intubation. And so we're going to train them on intubation. Whereas these other doctors that would just be a waste of their time.

[NK]: Yeah, and besides the... you're going to make videos now you have a little bit already. Do provide them with any like manuals or maybe. I've heard things about classify plasticized cards to just go with the with the material that you provide. So people know in short steps what they need to do, always or.

[RJ]: Yeah, so there are definitely we have a slide deck that we print out and give to them. So that they have all the slides that we've covered in our trainings. We also have if you will these Cheat Sheets. That in respiratory therapy, there are a few things. There's some settings that you make based on weight of the patient and breathing frequencies, and there are certain equations that you use to calculate. And so we give them Cheat Sheets for those equations, and some of the settings as well based on, you know, based on how the patient is presenting.

[00:38:53]

[NK]: Yeah, OK. Yeah, and I think one thing I forgot to ask for maintenance, there's just because uhm you have differences in service contracts or that you buy out a certain amount of maintenance that you guys are required to do over a certain amount of time or what. What do you think your guys? Your policy is going to be. Are you going to provide like lifelong support for your materials or?

[RJ]: Yeah, so we sell the ventilators with a warranty so they come with a one year warranty so we'll just pay for any replacements during that first year. And after that, it's up to the hospitals to purchase any replacement parts. We will ensure that the parts are available, but we're not going to cover that cost.

[NK]: yeah, and that's gonna be... Yeah 'cause, that's also kind of going into like the organizational change category, because one of the things that is being discussed in literature and kind of seems to differ per country in Africa is the management of spare parts.

[RJ]: Yeah.

[NK]: Uh, do you have any contracts or any of your ventilated already being moved into that state so they're out of warranty or like yeah?

[RJ]: No, not yet. Yeah, everything is still under warranty.

[NK]: Yeah, because do you guys deliver any spare parts at like on site already with your ventilators or...

[RJ]: We haven't yet, but our plan is to have at least I don't, I don't remember what we were talking about with it... It differs per country. Uh, with World Vision, I think we're going to have a few ventilators with the spare parts in country just available. But again, if we're going to a smaller and you know, like the Sierra Leone project where it's just a couple of hospitals, I don't know that we would do that. I think, I think what they're looking at is just basically having a ventilator, an extra ventilator on hand.

[NK]: Yeah.

[RJ]: That they can either just use or use for spare parts. And then worst case scenario, if something breaks, we can ship them that part.

[NK]: Yeah, that works as well I think.

[RJ]: Yeah, which is much less expensive.

[NK]: Yeah, I can imagine. Yeah, but I figured some stories already about the whole picture of reverse logistics being quite difficult in Africa, so that warranties and spare parts being sent over there or things having to be shipped back to the manufacturer, it's quite difficult. It can be quite difficult.

[RJ]: I don't know that we'd ever do like a an RMA where they need to ship us a part back. We would just it's under warranty. We're just gonna send him a new part. We might have them take pictures of it, you know, take a video so we can see what's going on and then and verify it and then ship them a new part.

[NK]: Okay, yeah, sounds logical.

[00:41:56]

[NK]: Uh, and then for the behavior change, that kind of comes with some equipment I don't know necessarily if your equipment asks that from medical personnel, but some of the medical innovations that are being done ask for quite big change in the habits and the usual practice of staff. And do you think that your ventilator and your CPAP machine asked others of...? If they do, how did you guys, kind of. Factored that into your strategy of maybe training or...

[RJ]: So it's, It's interesting, it does, but it shouldn't. So I'll explain what I mean by that. If you are a doctor, nurse, or respiratory therapist in a US Hospital or any European hospital, charting is normal. So as you are monitoring your patient, your charting well what's their CO2 levels, what's their O2 levels, what's their respiratory rate. You are charting that every hour.

[NK]: Uh-huh.

[RJ]: They don't do that. They should be doing it. That's like good medical practice, so it's not something that is unique to our ventilators. They're just not charting in general. Which is poor medical practice across the board, and so we're coming in. And you know, when we are working with these doctors, you know, in Mercer we realized they weren't charting anything. And we said, you know, you can't do that. You've got to be charting, especially with a ventilator you have to be charging what you're, you know what? What the progress or decline of your patient is.

And so yes, we printed out charts. They were ecstatic that we actually had charts, and they wanted copies of them. And that was surprising to us. We thought charting would be more normal than it was, and in Cambodia they were charting. So that's why I say it isn't it, isn't? It depends on the location. Zambia they weren't charting anything, so that's a behavioral change, but it really should be a systemic behavioral change. It's not just unique to ventilators.

[NK]: Uhm, it's an important topic to discuss because it's it can be disregarded as something that that's normal, but... uhm, some of the inventions that seemed to be quite normal for high end users are not that normal for them, so they asked quite a lot of the people that you're trying to implement these devices with. Which makes them sometimes fail. Because it just asks too much of them.

[RJ]: For sure, and yeah, I agree. I think, for a ventilator. We're not asking excessive amounts for my opinion. I mean, they weren't even charting, you know, blood pressure, heart rate, just your basic things that you need to be charting. They weren't even doing that, so.

[NK]: Yeah yeah. But then because you guys are aware of it with the things that you've experienced, do you guys do anything to support them with the behavior change that they have to do or just try to train them on the importance of...

[RJ]: So we do two things we do, well, we do three things. We train them on the importance, we provide them with the materials. Hopefully an easy method where it's just a chart sitting next to patient and you can look at the results and write it down OK. The third thing that we're doing is we implement a data gathering system, so we have an individual that we employ in Zambia who goes around monthly to all the hospitals where our ventilators are and records data. Well, the data comes from a lot of these charts, so if they're not charting, we've got a guy there who can go in and you know kind of, say, look, you've got to be charting if you're not charting, you know you're hurting patients, your you know...

[NK]: Yeah.

[RJ]: These are issues we also are. We haven't figured out what it is yet, but we're working on an incentive structure. To incentivize them to chart some of the things we're thinking as a manufacturer, some of the things we're thinking of are so with a ventilator you need a lot of accessories, so like a mask and tubes and all this.

[NK]: yeah the consumables I think are yeah.

[RJ]: Yeah, the consumables you're not supposed to reuse those, but they do because they don't have new ones. So as an incentive, we're trying to think through a prog program that we can implement with the Ministry of Health, where those hospitals that are charting that are gathering this data they get a more constant supply or an extra supply of accessories. I don't know. We don't wanna punish people that, but we need to figure out how to incentivize them. So right now they don't get any accessories.

[NK]: It's psychological as well. If you have an incentive, people are more inclined to change their behavior. It's just a proven fact. I'm yeah, I know the research and...

[RJ]: Yeah, exactly. Yeah, we just don't know what the right incentive structure is. Like obviously in this interview you can, that'll be noted as something, but it's something we're thinking about.

I don't know that we're going to implement it, but we are certainly thinking about some kind of incentive structure.

[NK]: Yeah, yeah, I've heard in another interview about behavior on this topic. It was something about also charting, but then on the maintenance field that they had to do a checklist on something just so that people could check if some parts of their materials were almost failing or how every part of their apparatus was working at the moment and they have some kind of I think. I don't know if it's any tangible awards, but just like you're number one or you get a T shirt or something, I don't really know. I still have to transcribe it, but.

[RJ]: Yeah, yeah, we might do something more. Yeah, more like that rather than medical equipment. We're just we're a manufacturer so our brain automatically goes to that and like, well, maybe we could send them more accessories or something. And it's like well, but do we want to punish people and then not send them accessories? It's like I don't know that that works so.

[00:47:56]

[NK]: Yeah, but yeah, there really has a direct effect on how your yeah like so yeah, talking about consumables. Uhm, because you do need consumables with your ventilators right? And how do you guys do that right now?

[RJ]: Right now it's not being done, so this is something we're working on because we're not an accessories company we're a ventilator company.

But we realized when we go into these places that they don't have any, and so we're working with our local NGO and Ministry of Health Partners to say, OK, well, what's the plan to get accessories out to these locations? It's one thing for us to say and we do, we have access to accessories and we can provide those and we are.

But then the question is distribution, great, so if you buy it just if you buy the accessories from us. How do we know that they're getting to the hospitals that need them? You know what is the system that's in place with the Ministry of Health? To ensure that all these accessories aren't just sitting in a warehouse in Lusaka.

Or I mean, this is part of the problem. Stuff comes and gets all sucked up by the Lusaka hospitals. Because everyone has needs. It's like Lusaka. Lusaka has just as much need as the external hospitals. In fact, they probably have more of a need. But that is part of the problem and so, so if you don't mind, I'm gonna share a tangent with you. I'm gonna share something else that's associated with this whole problem.

[NK]: Oh, yeah. Please do.

[RJ]: One of the biggest problems in these locations is the way that the medical systems are set up. And we witnessed this first hand and actually had, uhm, deep conversations with the Ministry of Health. Around how this would work. What tends to happen is you have rural hospitals that if there's a birth going to happen, they don't want to help the mother deliver in the hospital there. They instantly refer her to a District Hospital. The District Hospital then gets inundated with all of these births, and then the District Hospital says will anything hard we're going to refer up to the primary referral hospital in Lusaka?

[NK]: Yeah.

[RJ]: So I've gone to all these hospitals so then when we visited UTC it's called University Training Hospital. They get so many referrals that they can't handle them all. And so that's a problem, and so one of the, understandably, one of their things that they said to us was, well, we need all the equipment because we're getting all these referrals. We can't handle them all. So we need more equipment here. Yes, I get it. You do. But that's a band aid. The real solution is no, you need to empower the district hospitals in rural hospitals so they don't refer anyone.

And so that's part of the problem that we're also working on is saying. Let's ensure that these accessories and ventilators get out to the District Hospital so they stop referring so many people up to the overwhelmed referral hospitals.

[NK]: yeah then these consumables I think, are they also donated apart from your contract, is it a part of your or like to buy it from?

[RJ]: No, it's part of the purchase, yeah. Now I say no, but obviously there are projects that we'll work on. We haven't yet, but in 2022 we have some donors that are interested in funding whole implementations so it's the same model. The NGOs that we work with. They buy the equipment. Well, what are they buying it with? Donations? It's just we're not doing the donations they are.

[NK]: Uh-huh.

[RJ]: The only thing that shifting is we're actually going to start getting involved in the fund raising process as well for 2022 and secure our own funding from donations to go do implementations.

[NK]: But the are you then? Uh, so the NGOs do pay for the consumables? Like as far as how much they use or do you guys have to fill in the cost right now for being able to deliver all those consumables?

[RJ]: No, they have to pay for it. We can't cover those costs, yeah.

[NK]: And do you have like because what you said already, that they're probably not going to use it once, even if it's made to be used once.

[RJ]: Correct?

[NK]: Do you think that that could have a negative effect on the overall performance of your device?

[RJ]: Yep, definitely.

[NK]: yeah 'cause I think yeah, just listening to it. I would imagine that that would be kind of scary to see that if you provide ventilators to rural and district hospitals and they don't get consumables that your device might break a little bit earlier than you...

[RJ]: Yeah, or even worse, you have poor patient outcomes, deaths because you know if you're reusing a mask and a circuit you can get bacteria within that and then all of a sudden the bacteria is being inhaled by a patient and you create an infection in that patient and end up killing them.

[NK]: Scary things, yeah?



[RJ]: Yeah, so you know, yeah we, these are the realities. They try to clean them as best they can, which is good. But that's why we don't clean them. We don't reuse them because no cleaning protocol is going to be 100% effective.

[00:53:42]

[NK]: Uhm, and as far as these three topics go, like the training, the organizational stuff with, like the consumables, spare parts, behavior change and then the maintenance. In your opinion, how do you think they are interconnected?

[RJ]: I think all three are critical. They have to be connected and I can tell you I have quotes from the Minister of Health in Zambia saying. Uh, I had a lot. I had multiple long conversations with him where he said one of the reasons we like what you guys do is because you don't come in with a training, that's like a couple hours on how to push buttons on the device you actually train respiratory therapy like patient intervention and protocols. Even training beyond the device, and so that's what they're... That's what they need. They don't need a ventilator like we've said, ventilators, you can get a ventilator.

What they need is they need the training with the ventilator. They need a ventilator that's fit for purpose, you know? And the training that goes along with it. And then of course you know the big problem, I think of Africa and low resource settings is. This idea of maintenance everything breaks, so what's the solution to fix it when it breaks.

[NK]: Yeah.

[RJ]: And they were very keen about that as well. The ministries that was, we were peppered with questions around, well, OK, how are we gonna fix this when you guys aren't here?

[NK]: Yeah, but it's not that weird that everything that we're discussing here is something that's on their minds as well. Because I think everything that's being touched upon in literature is just maybe this surface of what's actually happening. So that's yeah, it's interesting to see.

[RJ]: Yeah.

[NK]: Yeah, it was very interesting. Everything that you had to say is it's a different view than companies that I've been in the field and actually have products there for 15 years. It's a very different kind of approach to everything which is interesting for me.

[RJ]: A lot of product companies I don't know who you're referring to and I'm sure a lot of them do really well. I think kind of a general model though has been to just sell product. That's why we have 70% of medical devices that aren't being used, because for 50 years we've just been selling products in the Africa.

[NK]: Yeah, true, yeah. Yeah, I've heard some weird stories is I've interviewed one person that said that he thinks that it part of the problem is also the donated equipment sometimes is already broken before it's sent over there.

[RJ]: Could be, could be. I haven't seen that though.

[NK]: Yeah, he said he stated it as though it was a given fact and I wasn't sure because.

[RJ]: I would disagree with that. Having worked in a lot of hospitals. I've not seen something, of course, I'm sure there are products that are broken when they're donated that that I don't want to say it doesn't exist, but I wouldn't say that that's common.

[NK]: Yeah, I hope not.

[RJ]: Usually what I've seen is you get it, you get something and you don't know how to use it or you get something and then in a couple months it breaks and you have no way to fix it.

[NK]: Yeah, OK, well uhm I'm gonna I don't know in what time frame but I'm gonna transcribe the interview and I'm gonna anonymize it and I'm going to send you the anonymized transcript so you can prove. Read them to see if they're anonymized enough to be taken into the data repository for my thesis.

[things on other contacts]