



## **Giving What We Can: Skype with Alix Zwane and Karen Levy (Evidence Action) on Tuesday 22/10/13**

***Rob: Could you tell us a little about yourself and your organisation?***

**Alix:** I am the executive director of an organisation called Evidence Action. It's a new intervention explicitly dedicated to massive scale-up of evidence-based intervention. We have identified and feel strongly that there is a real gap in the development space, between pilots and the generation of evidence - increasingly so in the last ten or fifteen years - and institutionalised programmes like GAVI or something like that. In this gap, our vision is that Evidence Action will be a leader, and will be truly committed to impact and scale across multiple sectors.

The programmes that we are beginning with are dispensers for safe water, which is what we're going to talk about here today, and school-based deworming, which you have previously recommended as an investment for your members. When you recommended school based deworming it had a different institutional home, which was Deworm the World, and Innovations for Poverty Action. As I'm sure your research has indicated, Dispensers for Safe Water has also until recently been housed in Innovations for Poverty Action. These two programmes have grown: our deworming work has reached thirty seven million people last year, and chlorine dispensers have reached a million people. It's increasingly clear that the right institutional place for these things is not in an organisation that's dedicated to generating research, but they need to be in an organisation that takes things to very large scale. Hence the creation of Evidence Action, and the transition of these programmes from our sister organisation IPA, to here.

Getting Dispensers for Safe Water under Evidence Action will poise DSW to go from reaching a million people today to our vision of twenty five million people by 2018. On the deworming side, we're hoping to be reaching one hundred million children by the end of that year. So that's the big picture of who I am institutionally. Personally who I am, I have been involved in some way with chlorine dispensers since about 2005 or 2006, and when I thought I was going to be a professor, I was one of the early research professors. I then decided to go into recovery (I'm a recovering academic), and my career now sits more on the donor side of the fence, and work primarily on evaluation and strategy. So I have a bit of a mixture of a background. So the sort of questions that I will be able to answer will be at a strategic, and a business plan level.

***Rob: Does the money donated via the 'donate to this project' go exclusively to the Chlorine Dispensers for Safe Water?***

**Alix:** That is a great basic question. Yes, it does go to ringfenced accounts that are explicitly and solely for Dispensers for Safe Water. We are actually in the process of setting up a donation page on the Evidence Action website, which should hopefully be live by the first of November. When this happens we will turn that button off at IPA and direct people to Evidence Action. But the rules of the game will be the same. It will be possible to donate to Evidence Action but direct this specifically to the Dispensers for Safe Water programme. We're working on a bit of language that will go up that will say to the donor, this is how your donation will be used.

**Rob:** *You've recently had quite a bit of good fortune, probably deserved, getting a very large grant from the Bill and Melinda Gates Foundation and USAID- something in the region of five million dollars?*

**Alix:** Five million dollars from USAID that is correct, and about two million dollars from the Gates Foundation, that grant is essentially complete however (the money has been spent). We have still three more years to go with our resources from USAID.

Shall I tell you a bit about our funding gap?

Our business plan is that we have a goal of reaching twenty five million people by the end of 2018. To stay on the expansion path to do that, we need to raise about \$6- \$6.5 million for 2014, 2015 operation. We're in conversations right now with some other funders, but this is the gap that we need to close.

So it's fair to say that we do need money right now and it's fair to say that we have absorbed the capacity to spend that money right now, because we've used some of the funding from the Gates Foundation and USAID to cover some of our fixed costs.

It took us 3 to 4 years to reach our first million people while we incurred these fixed costs, and we estimate it will take us about eighteen months to reach the next million. So we have been expanding at an exponential kind-of pace.

**Karen:** I just want to add something: I think the numbers that Alix are sharing with you are not an accident. They were outlined very specifically, because the more people we reach, the more cost-effectiveness goes up. The goals in terms of coverage figures and the resources required to do so are very specifically designed to get us to a point where the programme becomes sustainable, from carbon revenue, so part of what we're learning about scaling and part of how the scaling is designed here is that we're taking advantage of the increased cost-effectiveness that comes from operating at scale. So every additional resource has more and more leverage, towards that goal.

**Alix:** When people chlorinate their water as a means of improving its microbiological safety, they will do that instead of the alternative technology that is available to them such as boiling water or burning wood. The rules of the game under the Kyoto protocol allow you to burn carbon credits if

you can show that the programme you do causes this change to occur, or basically leapfrogs people over boiling water into chlorination. We as a third party, are auditors essentially, to verify our monitoring data around people who have access to and are using dispensers, and there are set rules of the game set up by the international community about how to turn that data into certified carbon credits which can be sold on the market.

There are two markets where carbon credits are currently sold. One is a voluntary market and that's mostly companies who are interested in talking about how they're carbon neutral for CSR reasons, and then there's a compliance market, under EU rules that countries in the EU have to all achieve some kind of a target. So it's pretty well known that prices in that compliance market, in the EU have collapsed over the past five years or so, because of the market downturn, and for a variety of reasons, and so prices in that market right now are in the region of one to two dollars for an emissions reductions unit. Prices in the voluntary market are higher: sometimes you can get five dollars, sometimes seven dollars, but that's a market of limited size. We could very quickly run out, if you will, of buyers in the voluntary market. So in our business model we assume that a lot of our emissions reductions will be sold on the compliance market at the current very low prices, and so we model that on average the price that we will receive for our emissions reductions is about two dollars and fifteen cents. So we're modelling, and projecting that the world will not improve in terms of carbon prices. So I think we're pretty realistic and pretty conservative.

Even at that low price, because dispensers themselves are so cheap, and chlorine is cheap, and adoption rates are pretty high, as we expand coverage we get closer and closer to financial sustainability. And so when we say that we can be financially sustainable In 2018, surveying 25 million people, that's assuming we're getting two dollars and fifteen cents for each of these emissions reductions, and that's to cover maintenance of the dispensers, replacement of the dispensers every five years, and our corporate or management costs. So it's our real costs; it's our sort of fully loaded costs that we will be able to cover.

Basically when I tell you it's my fully loaded costs, that covers all of my costs, including things like my salary that help us run our business.

We will face a strategic choice in 2018, of do we expand further, and then we go back into the world of needing patient capital to help us get ready to do that, or do we want to increase the surface level provided to the twenty five million people by doing something else with them?

***Rob: How do you choose who to work with and confirm they are doing a good job?***

**Alix:** There are two answers to that question. One answer is, because monitoring is central to our business model, the challenge of how much M and E (Monitoring and Evaluation) should we do, that an NGO might often face is not a big problem for us. We have to do a lot of monitoring because that's

how we get certified that we're really generating the carbon emissions reductions that we say that we are. So one thing that I like about this programme is that the monitoring is very actionable. We do monitoring because we make decisions on that basis and we make money on that basis. So a lot of the checking on programme quality just occurs as checking on our basic business. So that's answer number one.

Answer number two is; we do a lot of this work so far ourselves, so we employ hundreds of people in Kenya who are circuit riders to refill chlorine dispensers, who are field officers etc, so there really is quality control as a result of that these people work for us.

We do partner with other organisations too when we see a case for reducing our cost of doing business, for example one of the organisations we partner with really closely is called One Acre Fund, and again, we monitor the work that they're doing.

We continue to look for partners to work with because it will further reduce our costs and get us to sustainability that much faster.

***Rob: Can you let us know a bit more about the monitoring process- exactly what are you measuring on these projects to confirm credits and to check that the programme's working?***

Firstly, the question of the dispenser itself. Is the dispenser working and is it full of chlorine? That's absolutely critical to our business- we have found that if we let those dispensers be empty for even a couple of days, there is a real drop off in adoption, that it is very hard to pick up again. So we take very seriously the job of keeping the dispensers full of chlorine. This is primarily through mobile phone based communication with promoters in the community, so we send messages checking if they're making the refills and they can also proactively send us messages saying things are broke or they need to be refilled. We have pretty good data on these outage rates- they are of the order of less than five percent.

**Karen:** The system that we have in place to even find out about those when they happen allows us to respond to them very quickly, so it's an automated system with mobile phones that connect directly to a cloud based system for our field officers to service the dispensers on very rapid feedback timeline.

***Rob: Have you done any measurements of illness rates in the areas where you have the dispensers? Like looking at hospital records to see if occurrences of diarrhoea change?***

**Alix:** We particularly have not looked at health outcomes for two reasons: firstly the Gates Foundation has given about fifteen million dollars to IPA and ICDDR, to do a very large randomised control trial, of different water sanitation and hygiene interventions, and their effects on child illness.

There are projects in Kenya, Bangladesh, there is a project in Zimbabwe, and the intervention being studied in Kenya is Chlorine dispensers. So that's being done in a very large, very serious RCT. We have not collected health data in part because that study is going on.

However that's not the only reason. We are a programme operating at scale. We have no control group or counterfactual. I wouldn't know how to interpret that data coming through the programme, because there are lots of other things happening. I'd not be able to ascribe any health outcomes I saw to our programme.

The third reason is that there is actually quite a lot of good existing epidemiological data on the impacts of drinking chlorine treated water on diarrhoea. There are reductions in the order of 29% in a review by Colford and Arnold (2007), is the one I like personally the best. So we measure adoption, and we have a very good handle on adoption rates. And that really drives our business: are people using chlorine? Then we can extrapolate on existing meta-analyses, to think about how cost-effective is this programme in terms of dollar per DALY.

***When will the RCT come out?***

**Alix:** Between 2017 and 2019.

But I would encourage you not to say that we need health evidence on dispensers: we have health evidence on chlorine, and we are currently measuring adoption. The two of those things together give you meaningful information.

***Rob: Yeah, so are there any weak points - we know that chlorine disinfects the water, we know that people are using the chlorine dispensers - are there any weak points in the causal chain you might be worried about?***

**Alix:** There are two things to think about: When there is chlorine in your drinking water there is also a chlorine residual, which provides residual protection, so that's one of the nice things about chlorine as opposed to a water filter. There is a little bit of chlorine left over in the water, after the initial treatment, so that if my fingers touch the water, there is still enough chlorine in there to treat any faecal matter that may come off of my fingers. However that residual protection declines over time. It's potentially possible that if people treated their water at the dispenser, and its been held long enough before someone drinks it, it will be contaminated again. So that's certainly within the range of possibilities.

There's been some effort to look at the data in Kenya, in particular at when people keep water in their home, how long does it take for the water to degrade. Is this potential weak point issue number one or is it issue number ten in the grand scheme of things here? So some of that research that looks at that has mostly been published by Daniele Lantagne, if you wanted to have a look.

Those papers say that it's not perfect- nothing is, but by and large people are not holding their water

for more than twenty four hours before they're putting additional water from the Jerry can into it. So while sometimes chlorine levels dip down below the level recommended by the US EPA (Environmental Protection Agency), we are not getting back into seriously contaminated water again.

**Rob:** *But you'd be surprised if that was affecting the cost-effectiveness by more than 10-20% in total?*

**Alix:** I don't think that it's a major flaw.

**Rob:** *The next question is very related; do you think there are any weaknesses in generalising from the RCTs and the studies that have been done to the specific circumstances you're rolling out? In particular, for example there might be lower rates of illness in the areas that you're going to compared to where the tests were done, so fewer instances of diarrhoea are being prevented per dollar.*

**Alix:** External validity is always a concern. It's a concern with all research, not just RCTs. That's sort of point one. So following from that, it's the perfect enemy of the good in terms of evidence based intervention. Number three, sorry to wax philosophical with you, is that part of where the water sector is going right now is this idea of 'everyone, forever'; that water services are a public service, and it's the government's obligation to provide that service to people, for everyone, forever. One of the ways I think about chlorine dispensers, in our blanket areas is to be part of everyone forever; the services provided as part of a global commitment to safe drinking water, period, and with the variety of benefits incurred by that. In the water sector, people are really pushing back against measuring health impact- they're simply saying 'is this service provided all the time for everybody?' and that's what we're really going for. So part of how to think about this is with that public service, utility mindset.

Might there be lower health effects were we to really roll this out? As you really want to see if this is truly a cost-effective intervention. We roll out our programmes in two areas of expansion. Partly based specifically on reported diarrhoea rates in the DHS. So when we decided to expand into Uganda, part of the reason that we did so is that diarrhoea is a major problem in Uganda. That is one of the lenses that we use.

I agree completely with you in theory that as we expand and we start thinking about public services and getting to where we are in western Kenya right now, eighty percent of people are within two kilometres of a dispenser. So it really is reaching a meaningful, scaled level of coverage. It does reach people for whom diarrhoea isn't a problem, but that's what scale means. It's not just boutique projects, but a resistant, fully covered system that's going to have in its catchment area some people who need it more and some people who need it less.

Universal roll out reduces costs tremendously, because the main driver of that is going around and refilling dispensers. If you've got just one dispenser by itself, then driving out to refill it, then driving

back is very costly.

I think in the context in which we are working, where diarrhoea is an endemic, broad based challenge, the vast majority of people who are being served are people for whom this is a very high need product. By definition they are people who are still carrying jerry cans to boreholes, to get water. That's just a pretty poor group of people, and by definition, if you're getting your water at a borehole, and you're bringing it home, you are vulnerable to faecal-oral infection as a result of handling and storing that water. So I would actually say that we're nowhere near the position where that trade off becomes salient; we are still just driving down our costs whilst really serving a high need population. Is there some variation in that group? Yes, but by definition, if you're getting water at a borehole, faecal-oral illness is a big risk factor for you.

***Rob: What is the biggest weakness of your organisation?***

**Alix:** There are two things that I'm concerned about: One is that this is a tactical challenge. As we expand, we right size the expansion of our full cost pyramid. At the bottom of our costs are all those people running around filling up dispensers. But that needs to expand at roughly the rate we expand our coverage area. Then there are managers going up above that. We certainly want to keep the costs of this higher level down while we expand. That's often the challenge of any firm, while you grow; that you don't let corporate costs balloon. On the other hand, we have to be careful also that we don't sort of starve the beast, and we don't invest enough in that support structure that we can't support a resilient, high quality programme. So we want to keep that pyramid the right size. So that's a tactical challenge that we face.

Strategically, a challenge is a different take on the targeting question that you were asking about before. This programme doesn't target mothers with young children. It takes the approach of the water sector to the challenge, which is everyone forever. And I like that, I like everyone forever, it's a public service- we're really getting everyone access, and that's great. What about child mortality?- the people who are dying from diarrhoea are little kids, under age two or three. Is it possible to target those people more effectively than dispensers do, and is there a way we can use some of our carbon revenue, and cross-subsidise some a programme targeted at these little kids, because we care about both; we care about the public service, and everyone forever, but we also care about child mortality. So I would love to see our programme experiment with seeing if we can have our cake and eat it too; if we can have a public service and have a targeted effect on mothers and very young children. But that's something we could deploy for experimental purposes. That's something we're very interested in; in understanding whether we can do more about.

***Rob: What is the approximate mortality rate from diarrhoea among the people you're reaching?***

**Alix:** We have done some modelling ourselves to try to estimate our dollars per DALY, and of course we run into the same problems that you do. In the literature there are recommendations of how to do this stuff, and I think we're probably using the exact same rates. There aren't good figures on mortality, because even in places where child mortality is high, it's still a rare event, and so you need

these enormous samples to actually get good experimental data on mortality.

The one thing I want to flag for you on this is that where this sector is going is that we are increasingly emphasising not only mortality associated with acute diarrhoea, but the long term effects of stunting and cognition of sub-clinical conditions, called environmental enteropathy, that arises in people with repeated infections of diarrhoea. That stuff - I think it's fair to say that epidemiologists in this area are focussing on bigger problems - that stuff is crazy hard to turn into DALYs, and nobody does a good job of that. It's very unsatisfying in terms of getting to a nice apples-to-apples number.

***Rob: What is the progress like on your research into methods of refilling the chlorine?***

**Alix:** We are primarily settled on a service provider method of refilling chlorine. So it's staff of our programmes that respond to the outage methods, that Karen talked about before. We have experimented with this being done by district water officers, particularly there's some hope for that to be done in Uganda, where other NGO partners of the government are really focussing on upping the game of the staff more generally, regarding themselves as people who provide a public service and do not just make infrastructure investments. So we're talking with them about having chlorine refilling being part of what the water officers do as part of their regular job. So that would be great if we were able to do that.

Another area we're flagging there, something that could really change the game for us, and somewhere where we continue to invest research, resources is the question of whether one might be able to use powdered chlorine, as opposed to liquid chlorine in the dispensers. If you were able to do that, you could reduce dramatically the number of times you had to go to it, and we could begin to have this circuit-rider thing be a much smaller part of the business. So we're actively continuing to invest engineering, research resources into figuring out what is the right user interface for that, how that could work in practice.

***Chloe: How do you think chlorine dispensers compare to other interventions such as sanitation and hygiene? Why did you go with this technique?***

**Alix:** I think that the evidence on water quality improvements, and their impacts on diarrhoea is significantly stronger than the impacts on sanitation, on child health impacts, and it's even stronger than the research that exists on hygiene. There are a couple of papers that you might look at to help you think that through.

I think handwashing affects health, and the best paper on that is D Luby's paper: even if you don't use soap, you're just rinsing off your hands and wiping your hands on your sari, it's still enough to generate amazingly biomedically important impact on child health outcomes. The issue is we don't



know anything about how to get people to wash their hands. So the Gates Foundation funded some very big evaluations of an at-scale hand washing campaigns in Peru, Vietnam, and Senegal. These are RCTs, so well identified. They got people to know they should wash their hands, they got people to know how to wash their hands, they did nothing at all for actual handwashing practices. I am not convinced we have any good scalable models for handwashing. Similarly on sanitation; based on the large evaluation of scalable sanitation interventions, in Indonesia in particular. There you see changes in toilet use by people who already have a toilet. You see very little effect in toilet construction, and on average a small biomedically uninteresting impact on diarrhoea. I don't think we have good models for at-scale sanitation interventions in rural areas in particular. On the water side of things, in contrast, I think we understand pretty well that improvements in water quality translate into biomedically important changes in diarrhoeal rates. We don't know about mortality, that's true. We don't know yet about environmental enteropathy- whether these things can actually move the needle on environmental enteropathy or not, which that big trial hopefully will show, but I do think it's pretty clear that water quality is something that improves health.

There's one other intervention, which is water quantity rate; increased access to water which might increase the total litres per person use. In areas where we work, litres per person are far below the twenty litres per day that is the recommended minimum by the WHO. So people are rationing in all kinds of ways the water they use for washing their hands, for washing their face, for washing their clothes, so we do think that constraint has enormous health benefits, and enormous quality of life benefits. There are some very nice papers demonstrating that. Even for people for whom we don't think the constraints translate into health benefits it makes people a heck of a lot happier, to have water; washing your face is nice and being clean is nice and it has nothing to do with health. So I think the kind of interventions like Water for People, those NGOs that are about everyone forever, that are about base rate access, are very high value interventions, and something that lots of organisations would be proud to support. That's not just a health argument for those things, it's also a quality of life and a happiness argument for those programmes. So I think dispensers are a good bet as an intervention, within the portfolio of things that an investor might take on.