

Wellcome Genome Campus | 1-19_scaling_up_in_pandemic_video_1_v2 (Original)

So good morning, we are here today with Harper VanSteenhouse the site director of the lighthouse testing lab in Glasgow. Hi, Harper. Can you explain to your audience what are the lighthouse testing labs and what is their role?

Yeah, absolutely. Thanks for inviting me to share a little bit of the story that we've lived through over the last couple of years. The early days of the pandemic, the UK government decided to set up centralised testing at three or four, eventually, lighthouse testing sites, distributed regionally across the country. And so each of these were set up very quickly in coordinated fashion to run COVID, PCR based testing, for the community. People that needed to get testing, either because they had symptoms, or because there were at risk populations. Or for in fact the home testing, where you could request kits be sent to you, you do the swab and send it back. So those are the main projects that we did.

We've also used these labs to run some of the vaccine trials, and generate some data, as well as survey data for the Office of National Statistics, and these sorts of things. But it really is the workhorse of the government's testing capabilities.

Can you tell us a bit about your role in the lighthouse testing labs?

Yeah, so I joined a really great team. They had already set up a lot of the capabilities for testing when I joined about a month in. I, in normal times, run a company in the same building where the lighthouse lab in Glasgow would set up. So I knew all of the people working on it at the university, who sponsors and runs the lab. And so I joined a site director to take sort of the next phase to build the scale. So we were running a few thousand samples a day, and then we continued building the lab scaling up to the point now where it's at 105,000 samples a day capacity.

So you did mention a diversity of skills there. But at a higher level, what partnerships do you think were important to set up these national labs?

Yeah, it was a really interesting and fulfilling time, because everybody knew what the mission was. We're all very motivated. And so I think you get, really, an unusual level of collaboration. The groups are pretty collaborative, normally, but this was really special. So the government was involved, very deeply, in terms of setting policy, figuring out what they needed to have done. Which for me is a little bit awkward, because I'm used to being involved in those things, or even leading those decisions. And then making sure that I was setting up the lab and leading the lab group to be nimble enough to react to whatever was happening, whatever policy decisions needed to be made, in the landscape.

I mean we had no idea what was going to happen. And so those interactions were really key. I won't say they were easy early on, but we learned how to work with each other, and it became quite efficient. The university, obviously, is a massive player in all of this. And so we had, really, the strengths of the university in terms of running a large organisation. So for me, I mostly work in sort of startup-- startup land if you will. And so 800 people is kind of a lot, but to the university 800 employees is nothing.

And so they have the HR, the hiring, the advertising, the employee aspects, as well as all the legal requirements that we have to go through really locked down. So they brought a lot of that to the table that I could just depend on it being done well. And then I could just work on the science in the operation, frankly. And that's how we communicated constantly, daily, seven days a week, through all of this. But we all knew where our strengths lay and where each other's strengths were, so we could let the others contribute where need be.

And so same thing happened on the science. We've got some people that are really good with robots, some people that are really good with PCR, some people are really good on the IT side, and everybody really contributed an added where they could.

How does the infrastructure look like in a lighthouse lab to achieve these numbers.

Well this is something that's changed quite a bit over time. We started out just with a handful of post-docs and with pipettes. And doing what I recognise as PCR, from my academic days also. But you can't do that and scale up, and so we have quite a few liquid handling robots that really speed this up. In addition to making things go faster. It's really critical to have the traceability that the logs coming off of the robot provides, the stability.

Remember, we've got people working through the night, for day shifts, but still this is a long journey that we're on. And so anything we can do to help our technicians and scientists, so that they can use their brains for what they're designed for. And then let the robot do a lot of the repetitive tasks. So we don't unnecessarily wear out our scientists, quite frankly, is key. Then there's just a massive number of RNA extraction, automation instruments, and even more PCR machines. And so any time you get that many-- I mean, I've never seen anything like it, in terms of this quantity and capability of a lab.

And so then you start thinking about the secondary concerns, which is cooling those rooms down. And we have 100 PCR machines, that's 100 bulbs making a lot of heat and Peltier cyclers that are generating a lot of heat. And so we have to be really careful, those sorts of things. There's power demands that become very non-obvious, but very critical at that point. And then you also have to think about just physical infrastructure in terms of moving things around. So people are constantly moving, but we need to keep a safe environment.

So having trolleys that have guardrails on them so that nothing can get spilled. And then even the sort of more mundane, which is staff break rooms, and making sure we've got biscuits, and coffee, and things to make people feel comfortable through their day also. Because it's still a workplace, at the same time as being a world leading lab, and so there's a whole bunch of things. In early days, we had to think much more about security. There were questions about national security, even, when you consolidate this much of your national infrastructure, and very few sites. We had to think about all these sorts of things and make sure that really nothing was left to chance, because of how critical the labs were.

What were the major challenges faced while scaling up?

The biggest problems early on was getting our hands on consumables reliably. At the beginning, I mean, we think back, it seems like a million years ago people had a hard time getting their hands on toilet roll. We needed to get our hands on PCR reagents, 96 well plates that would fit in all of our PCR machines, and we had to find the PCR machines very quickly. This was a massive group effort. The army, actually, came in to help with a lot of moved instruments from labs, academic labs, or industrial labs that donated instruments in early days to get us started.

Then once we have the physical pieces that we needed to run the stuff, really people, was the key. You can't do any of this without a lot of really good, really sharp people. In early days, we depended very strongly on the academic community that was recently on pause, because they were not allowed to go into the lab. But very highly trained, ready to go into action. And they helped build the process really from the beginning.

So what were the main impacts of large scale testing of community samples?

Well, I mean I like to think that we had a massive impact, in terms of both quality of life, and the safety, and health of the nation. I hope that's not too grandiose. But having a world leading capability, even when it wasn't strictly needed or even used, but having that capacity, having the ability to be ready for whatever happened, I think, was really key in terms of minimising the impacts to people. It's been impactful for everybody.

But if people don't know they have the virus, or especially, asymptomatic transmission that we're very worried about early on, especially. Being able to keep an eye on these things, and make sure that in a bad situation we managed to kind of make the best of it as a community. I think-- I hope that's how people see these labs and the benefit that we provided.

Thank you, Harper. For sharing with us your insights into a unique scaling of experience.