

All (Washed) Hands on Deck: How to Help Yourself & Others Right Now with Dr. Mike Wells

Ologies Podcast

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Oh heey, it's your fig tree, just waitin' in the yard to see how many leaves it has to sprout and unfurl before you stop and say, "Oh look! The fig tree has leaves!" - Alie Ward, back with a bonus episode of Ologies. Did I think I was making this episode 2 days ago? No? No. But sometimes you see a tweet and you say, "Boy howdy, let's get this human on the horn." Pass the mic and spread the word. So, the March 10th Virology episode was recorded on March 5th... A LOT has happened in the last few weeks, I don't know if you've noticed. So, I added an update before the intro to that episode but I'm going to read it here too. Virologist Dr. Shannon Bennett wrote me on March 17th and let me know:

Daily new confirmed cases are growing in number exponentially here in the US, and that is in light of one of the lowest per-capita testing rates worldwide by country; 26 tests per million people, as of March 10th. That means that even though we all recognize that confirmed cases are just the tip of the iceberg of the actual infections, in the US our iceberg is particularly submerged. In short, it's time to take social distancing seriously and flatten the curve.

So that was an update from Dr. Shannon Bennett of the virology episode. In light of the lack of testing, especially comparatively, plenty of us here in great old America are asking: Where are the tests? [*repeated, whispering*] How can we get the tests?

One guy, a neurobiologist and postdoctoral fellow at Harvard's Department of Stem Cell and Regenerative Biology and the Broad Institute said, "Well, shoot! We have so many ologists out there. Let's just see who wants to help!" (I'm paraphrasing.) And he put together a Google Form, just as a private citizen working completely independently, not as an employee of Harvard or The Broad, and within hours had an army of scientists who are ready to combat SARS CoV-2, the virus that causes COVID-19, which we covered in Virology (in case that confuses you - I get it). So, if only we can use the strengths we have and come together, we'll be in a much better place.

Rather than just retweeting the URL to the Google Form, I thought we'd make an episode out there! For anyone who wants to help but just doesn't know what to do and for anyone out there who could use some advice on taking care of their own mental health during this weird time, which we probably all could use. So as Disasterologist Dr. Sam Montano said in her episode, "People are much more pro-social in a crisis than we expect them to be." That's great news! And in Mr. Rogers' words: [*"Always look for the helpers."*] So let's chat with the dude with the Google Form about how to get involved, and hopefully signal boosting this will help get this database into the hands of Government agencies that will use it and put it into action.

This is a bonus episode, it's ad free, but a donation was still made to the LA Food Bank, and I would not be able to do those things or make the donations to causes each week without the folks at Patreon.com/Ologies. While I was at it, I asked patrons how people have been helping them, how they are helping family and friends, and maybe strangers, and for some of their self-help suggestions, which I am all ears for! And just a heads up, this episode has fewer asides than usual, just for a much quicker turnaround, and it's more of a raw conversation than most episodes. Also, the first 10 minutes or so I ask this ologist a BUNCH of questions about his backstory because he's really

amazing, and relatable, and inspiring, and it's just really interesting. And I want us all to remember that scientists, and neighbors, and healthcare workers, and grocery stockers are all people with these incredible stories. The more we remember that, the less alone we feel.

If you need some updates on this illness, and a healthy dose of hope, you have come to the right place. So hunker down, get cozy, and prepare to feel inspired by the folks out there who have our backs, including de-facto community organizer (working from an extra desk in his apartment) and professional neurobiologist, Dr. Michael F. Wells.

Alie Ward: So, hi, thanks for talking to me!

Dr. Michael F. Wells: Sure, of course!

Alie: You've had a busy couple of days...

Mike: Yes, I've not slept much. I was supposed to be doing other work, as a scientist, but I've been focusing on this pretty much nonstop since Wednesday.

Alie: Can you tell me a little bit about what your work at Harvard entails, usually?

Mike: Yes, so I'm a post-doctoral researcher, which means I already have my PhD, but I don't yet have my own lab, and so I work for a guy named Kevin Eggan at Harvard in the Stem Cell Department. And so, what I do is I take human stem cells and I convert them to human brain cells in a dish. [*Alie whispers: "wow"*] Yeah! You might wonder where those stem cells came from? We can actually harvest... take cells, say, from your blood or your hair. Some have started taking it from urine. [*Alie exclaims: "oh!" Dr. Wells chuckles*] We can convert those cells into stem cells, and then we can take those cells and make them into many, many different cell types, so that we can study diseases in the cell types that are actually impacted by that disease. The disease I've been studying for the past four years or so has been the Zika virus infection. I take stem cells and I make them into fetal brain cells, or at least cells that resemble fetal brain cells...

Aside: Mike recently made a discovery about how one's genetic background influences your susceptibility to Zika infection. Like, no big deal, just did that. I recently re-potted a plant I've kept alive for a year, so, [*smug sigh*] I get it. But prior to his work at Harvard he got his Bachelor's of Biology at Notre Dame and his PhD from Duke in Neurobiology, working with mouse models, studying the genetics of ADHD and autism. So, we're all just a bunch of lumpy brains helping other lumpy brains, sometimes via mice.

Mike: Just like, what are the mechanisms from the gene that leads to the disordered behaviors? And you actually see some of these behaviors in a mouse. Of course, it's a mouse model, it's not perfect, and that's partially why, when I moved to Harvard for my post-doc in 2015 that I switched to studying human cells in a dish. I was much more interested in studying the human condition, and I also became quite severely allergic to mice over the course of the... yeah. So, if you work with mice for eight hours a day for six years, they will get their revenge on you if you don't properly cover your mouth and make sure you're not inhaling all the irritants that they release. [*"I can taste it."*] So yeah, I can still work with mice, it just has to be quite limited interaction with them.

Alie: Oh my gosh. Now, did you have a microscope when you were a kid? When did you start getting into science?

Mike: Uh, that's a very good question. There's a book, the first book on my bookshelf, top of the bookshelf, far left. It's called *The Value of Believing In Yourself*, and it's written by a guy whose name I believe is Spencer Johnson. He wrote this book about Louis Pasteur, and it's the first book that I remember ever reading. It's about how Louis Pasteur created the treatment for rabies. Now, if you get rabies it's no longer a death sentence because of Louis Pasteur's discovery. I remember being five or six years old and just thinking, oh wow, this one guy in a lab dramatically changed the course of human history by eliminating this disease from the list of things that could wipe us out if it spreads.

That influenced me at a pretty young age. You know, I didn't really come from a family that had a lot, and so it was mainly through books that I developed this interest in science. By the time I was in high school I was more interested in biology and trying to understand how the human body works. And I thought I was going to go to college to prepare for medical school, but I quickly realized that I can't see someone having their blood drawn, and even... talking about it you can hear my voice slowing down, and I'm trying not to pass out... And I realized that if I can't see a blood draw, I probably shouldn't go into a field in which that is something you will see commonly. Even if you're not doing it yourself, you will see it.

So, I remember I went home for Thanksgiving break while I was a sophomore at the University of Notre Dame and that's when I realized that I don't want to be a medical doctor. I went home, and on my bed was a *National Geographic* magazine, and on the cover was a guy with all these electrodes on his head. I was like, "Okay, I'll do that. I'll be a neuroscientist!" [Alie laughs.] That's pretty much all the thought that I put into it. It was just something that... I just saw a picture and I was like, "Okay, I'll do that." So, I think you're seeing a theme here? That I'm easily influenced by media.

Alie: [laughs] Who knew that sci-comm could change minds in so few steps?

Mike: It is a very, very powerful medium, and I can't stress enough how important it is for people growing up in low income houses, like how I grew up. I didn't know a scientist until I got to college, and even then I didn't quite understand what they were doing. A lot of people growing up the way I did are just not exposed to these things, and don't even know, one, that it's an option, and two, what the job entails. And if they did know those two things, they don't necessarily know the third factor, which is how to get into this system. You know, academia is very competitive and there's a lot of internal challenges you have, just feeling like you belong.

I'm actually Salvadoran, my mom is from El Salvador, and I actually never felt like... I mean, you can see in this Skype, I'm not that dark skinned, all my family is much tanner than me, so I never felt like I was being held back because I was a minority. However I did feel that I was being held back because I did not come from a house that had a lot; a lot of money, or power, or however you refer to it. And that becomes very challenging in academia because you are working with people whose parents were biochemists, or mathematicians, and they might come from backgrounds that made it a little easier for them to get to where they are, and to feel comfortable where they are.

And I think that is - you hear this term a lot - imposter syndrome in academia. It comes from people not feeling that they belong because they see the backgrounds of those around them in academia, and I do think that the most powerful way of overcoming that and getting our field beyond that is through early science communication.

Aside: That said, one kids' science show I did for Netflix is called *Brainchild*, and they have free lesson plans and curricula if anyone is homeschooling the kiddos now and needs some resources. You can go to BrainchildShow.com to download them for free. I'll link that in the show notes, in case it helps.

Also, my science show, *Innovation Nation with Mo Rocca* is on Saturday mornings on CBS. And my other show *Did I Mention Invention?* is on Saturdays on the CW. Also, *Mission Unstoppable*, another great science show for kids, particularly girls. I don't work on it but it's very good. Also, my friend Emily Graslie makes great YouTube videos on her channel, *Brain Scoop*. Dr. Joe Hanson hosts *It's Okay to Be Smart* on PBS, I love his stuff. My friend Derek Muller hosts *Veritasium* videos on YouTube. Lepidopterology guest Phil Torres has his *Jungle Diaries* YouTube series.

I'm gonna make a list of links in case you need kid-friendly things to watch, that don't have swear words, which I'm trying very hard to avoid in this episode so that you pass it around to other people and we fix this problem.

Okay, let's get back to Mike! He has a manuscript he needs to be working on right now, but he's working from a small office at home to become this community organizer with this project. And he has a little experience in this, having worked on the Obama campaign in 2008, but he did have to cut the job short halfway through his 6-week stint, because... I'm gonna let him explain.

Mike: I mistakenly thought that I had an unlimited phone plan, and I didn't. [*Price Is Right loser horns*] So, I remember I was in the field office and I got a call from my mom, and she was just like, "Mike, we just got a \$650 bill from Verizon, did you make X number of calls?" And I'm like, "Uh, yeah? But it shouldn't matter, right?" And she's like, "No, we got rid of that option like six months ago." [*Alie: Oh nooo!*] I was trying to save up for grad school at that point, so I had to quit, and I ended up working in a daycare center for the rest of summer, teaching kids science.

Alie: Oh, my gosh. I guess just consider that a donation to the campaign, right?

Mike: Yes, yeah. That was pretty rough.

Alie: Tell me a little bit about what you're organizing. Do you have a name for it yet?

Mike: No, I mean, the form is called COVID-19 Pandemic Scientist Volunteer Form. And essentially, what I have done is this past Wednesday, March 18th, was the last day that my lab was going to be open for the next two months. Again, I'd been studying Zika virus for four years now, so I have all the skills necessary to perform the COVID-19 testing, so I was really hoping that at some point, as places start ramping up their testing capacities, that I would have the opportunity to start working at a facility to just help out in the efforts.

So, I'm pretty active on Twitter and I was seeing that there are these sign-up forms in Seattle and the Bay Area. I later learned that there was one being widely distributed for the New York area, but what I hadn't seen yet was something for Boston, and I hadn't seen

anything that was trying to aggregate all these different sources into one central location. Essentially, what I did was I created a form in which I'm asking for contact information from scientists, asking them if they have experience in certain techniques that are required for testing, and then asking them if they have any sort of reagents, or kits, or equipment that they can donate to these testing facilities.

Aside: Now remember, he just started this on Wednesday, and I talked to him yesterday, which was Friday evening.

Mike: So that was about 50 hours ago, and we now have 3,368 respondents.

Alie: Oh my God!

Mike: Yeah! So... These scientists, we're very eager to help out. A lot of us are at home right now, we have the skills, we just need to be added to the team. And I do want to say something about how this spread so quickly. I need to give credit to a few people. One is my friend Justin Boreta who is in the band Glitch Mob, they're like an EDM group. One is a musician based in LA, her name is Elohim, and another is my friend Michael Angelakos who is the lead singer of the band Passion Pit. What I did was, after I created the form, I texted them and said, I'm about to post something on Twitter, can you please re-tweet it? So it's their audience, they have thousands and thousands of followers.

Then Justin actually reached out to a man by the name of Tim Ferris who has 1.6M followers. So once that happened, he retweeted it, then Drew Carey - a comedian that I have adored since I was a child - retweeted. So it reached a very, very wide audience. And then you, of course, retweeted my efforts a few hours later. It reached a very wide audience in a very short period of time. And I think that's what really helped accelerate this, because once those scientists started filling out the form, they then sent it to other scientists that they know.

Alie: So essentially, your viral form went viral also. Which is wonderful when it's something good, but also a terrifying display of how quickly something can spread.

Mike: How quickly! As I'm watching this form being filled out in real time. It's been exponential. We went from 30 responses in the first 20 minutes to, you know... I think by last night there was about 1,500 and now there's an additional few thousand today, so it is growing exponentially. Obviously, it's going to hit a plateau once all the scientists who have these abilities are reached and they have filled the form if they're willing to. So, it will hit a plateau. Hopefully that doesn't happen until it's reached as wide an audience as possible.

Aside: As of my recording these asides, on Saturday night, he now has 4,763 scientists from 49 states, Puerto Rico, and Guam. And of course I asked him which state was lagging. I see you, 49. And I guessed Idaho. I'm sorry Idaho. But no, are you ready for this? It's... [*whispers conspiratorially*] Wyoming. [*more animatedly*] Wyoming?! Come ooonnn. Someone from Wyoming, just pull up the frikken' caboose. The tinyurl for the google form, by the way, is [TinyURL.com/COVID19SciVolunteers](https://tinyurl.com/COVID19SciVolunteers) and no, you do not have to write that down. It's linked in the show notes, *Wyoming*. [*"Good luck, we're all counting on you."*]

Alie: And now, let's talk a little bit about how testing is done. I mean, you work with Zika so you're familiar with viruses that are zoonotic in origin. How do you even test for COVID-19 and [*exasperated*] why isn't it happening?

Mike: *[laughing]* Soooo, those are two different issues, in my opinion. To answer your first question, the basic test for the presence of a virus is that you get the sample; it could be spit, it could be these nose swabs you're seeing on TikTok that look extremely painful, they're putting that thing way back there. But what they're trying to do is trying to get a sample from your body that either does or does not have the virus. And these are areas that, if you did have the virus, it's likely that the virus would be present. The reason the virus is likely to be in your spit and in the back of your nose is that, for this virus in particular, it tends to infect the respiratory system.

This is an RNA virus. You may be aware of what DNA is, I think most people are aware of what DNA is. Well, RNA is what the DNA becomes when you're trying to make a protein, you have this intermediate step of RNA. This virus is just an RNA virus, that's pretty much what is being transferred from one person to another. It's a piece of RNA that is encapsulated by an envelope. And this is why when you wash your hands you kill the virus, because that envelope gets degraded by soap. RNA does not last a very long time without that envelope, so this is why it's so important to wash your hands.

So, essentially what happens is we then will take that sample, extract the RNA (that's a very key step that I'll get to in a second), we convert it back to DNA, and then we run what's called a polymerase chain reaction. You might have heard of PCR. Someone won a Nobel Prize, in 1993 I believe, for creating this machine that amplifies DNA.

Aside: Okay, so, I wasn't going to look this up. This was supposed to be a minisode. But you know what? We're in this! And frankly, a lot of us have nowhere to be. So I googled who the winner of the 1993 Nobel Prize in Chemistry was, and it turns out that it was the best decision I've made so far in quarantine since buying several tins of smoked trout. So, according to his sadly recent 2019 obituary in the LA times, Kary B Mullis was an LSD-dropping, climate change-denying, astrology-believing, surfing, Nobel Prize winning chemist who was both widely respected and equally criticized for his controversial views.

So, what did he do? Alright, his history-changing process involves taking a segment of DNA and heating it until it unzips, and then looking for a specific segment of DNA, and then zipping it back together via an enzyme (or polymerase) with free-floating building blocks (the AGTC nucleotides). And then doing a chain reaction of that, so that each copy makes two copies, and so on, and so on, so that you're able to replicate a ton of that segment. So a polymerase chain reaction, PCR.

Now, Mullis came up with the idea while driving down the highway. Just... came up with this idea that changed the world. He once said, "I think really good science doesn't come from hard work, the striking advances come from the people on the fringes being playful." He playfully said, from the fringes. Side note, he was drunk the morning he found out that he won the Nobel Prize alongside chemist Michael Smith, who was probably not drunk. Mullis then celebrated the win.... By going surfing. I am trying so hard not to swear during this episode. So, mmh! Hot dog! What a life.

Maybe, let that be a lesson to just chill out while in isolation. Don't work so hard! Play horseshoes. Learn an Irish jig. Just get high and eat some raw biscuit dough. Read a novel you don't think you deserve to. Either way, you're avoiding the virus. You might even end up

winning a Nobel prize. Just don't surf drunk, I guess. Now, what if you're sick? How does the test work?

Mike: So, let's say you have the virus in your system, we take a spit sample, we then extract the RNA from your spit sample, and when we run the PCR, it'll tell us whether that RNA was actually present in the spit. The way it's usually done is with a machine that's more quantitative than the standard PCR, and what this does is it incorporates a green dye into the DNA as it's being replicated and amplified by this system. After every cycle that it runs, it will take a picture and measure the intensity of that dye. It will tell you, how much green fluorescence is present in this system? And then you can use that green readout as a way of measuring the amount of viral RNA present in the sample.

So, that is the basic testing system that is in play right now. It's looking at whether or not viral RNA is present in the sample. Having said that, as a result of the national emergency being declared, there are now loosened restrictions on the types of protocols you can use to test for COVID-19. Some universities have found ways that are much faster than the thing that I just described to you, and they are in the process of getting approval through the FDA, through their state and local authorities, to use that as a test in their community. I do anticipate that we're going to actually learn a lot about different ways to test for these viruses, to make these tests more efficient, because the need is so clear right now for us to do this very quickly, and safely, and accurately. So that's what's going on right now with the testing.

If you want to know why there are no tests going on, [*"That's the million-dollar question."*] there are, but they're not where they need to be. That's primarily, from what I've heard, an issue with the lack of reagents. So, that RNA extraction step, which is the first step for most protocols, those are usually made available through a kit. The most commonly used is this kit from a company called QIAGEN which is based in Europe. There are very, very few QIAGEN kits available for these labs, and so one of the things being included in the database was a question that we asked all these scientists: Do you have RNA extraction kits that you're willing to donate from your lab to a facility that is currently testing and in need of those types of kits?

Aside: Lawmakers, holler! Are you in government? Could you use a list of scientists willing to chip in and help out? Well here it is. Free for the taking, so let's speed this system up. Get some swabs up some nassholes, stat.

Alie: And, why do some tests, I'm hearing, take like 5 days to get back right now? Is that just the availability of the reagents?

Mike: I think it's the availability of the reagents as well as the backlog of tests that need to be done. I'm not actually working in any of these facilities, so I can't speak directly to that, but if you don't have enough kits, or you don't have the capacity to do so... Some of these places can only run 20 samples per day. If there are 100 people in line then it could take up to five days to get your results. That's clearly not good, that is not going to be helpful. If you look at what happened in Wuhan and how they eventually got control of the virus, to the point where they are now having very few new cases each day, part of it was because of a very aggressive testing system they put in place in which they would actually go door to door

and determine if someone is showing symptoms. If they were showing symptoms, they would administer a test right there and get them the results back as quickly as possible.

We are nowhere near that in this country, and even with that aggressive approach that they took, which also included something that they call 'centralized quarantining', they are still not looking at a coronavirus-free environment until mid-May, and they had the outbreak start in January. Even then, it's taking them five months to get rid of this thing. We are just now in the early stages of this and we are not being as aggressive as them, so it's likely that this is going to last longer than what took place in China.

Alie: This is a stupid question, but why were they able to do those door-to-door tests? How did they have such an availability of kits? Is that partly from the SARS infrastructure from 2002?

Mike: It's possible. I don't know the exact answer to that question. They might not even have made that information available, I'm not entirely sure. I know that for Wuhan they had a lot of scientists and doctors from outside the Wuhan region aggregate into Wuhan to help out with this. It's also possible they had their own manufacturing facilities to make the RNA extraction kits. It's not just QIAGEN that makes these kits. There's a lot of them out there, which is something that kind of makes it a lot more challenging, because different facilities in the United States are using different kits, they're using different key PCR reagents, different machines. It's kinda all over the place right now, there's no real agreed-upon protocol.

Alie: What types of scientists can help pitch in?

Mike: This is what's really nice about this, and this is why we have now 3,387 respondents, [*Alie giggles*] is the fact that these techniques are things that most life scientists learn very early on in their careers. RNA extraction is the first step of many different procedures you run at any given time in a laboratory. PCR is a hallmark procedure for so many things we do. I mean, PCR was the first thing I learned in lab during rotation at Duke university. The absolute first thing I learned was PCR. So, this is not something where you need a PhD to do. There are technicians who are undergraduates at a university who immediately learn these things. I had a high school student in our lab a few years ago who was able to run key PCR in his first week.

Alie: Let's say that we can go ahead and do this, like, it's Go Time. How do they make sure if they're voluntarily doing this, that they're not getting contaminated by samples and they're keeping their own health in check?

Mike: Yeah, that's a very important question, and that's why a lot of these facilities, from what I've been hearing, are actually training these people. There are certain certifications you need to receive in order to work with potentially infectious samples. I've seen that in some places they're doing one or two training sessions per day to get everybody up to speed so that when they go in there, they're not putting themselves at risk. That is something that each facility is presumably going to take care of. That is something that's heavily regulated, for good reason. If it's much more regulated, they are much more stringent with certain aspects of the procedures. Again, this is why you don't want to just hire anybody off the street to do this. Ideally, you'd pick someone from this 3,392-person list [*Alie laughs at the growing number*] who already has experience in these techniques and would be able to pick it up very quickly.

Alie: And now, what about access to some labs? In these kinds of extenuating circumstances, if you're working with very few individuals in a lab, you're keeping 6 ½ feet apart, nobody's slobbering on anyone... is it okay to sneak back into your lab and do a little punk rock testing?

Mike: That's a good question. To be clear, not all labs around the country have closed. Harvard was one of the first. They followed suit from University of Washington and Stanford, so the West Coast started this idea of trying to de-densify laboratory settings. The rest of the country that does have their lab shut down, including Harvard, essentially what we're doing is there is a very small number of people who do have access to the lab, and it's very limited. I was chosen for my lab to be that person. I'll be going in tomorrow, I can be there for 3 hours. I can feed this specific set of cells and then I have to leave. They regulate all this because most of these buildings have key cards, so they can toggle my access and I couldn't, for example, just walk in right now, because I'm not authorized to go in on this date.

Aside: So a lot of labs right now are authorizing certain people for specific times, that way they can avoid close contact or running into each other. Now, Mike agrees with those tactics, he thinks we have to stamp the virus out as quickly as possible so it's not endemic (or just kind of loitering around) as part of a new way of life until there's a vaccine.

Alie: Are there any vaccine researchers or scientists that have signed up to say, "Put me in, coach"?

Mike: I did include on this form an option to select whether or not you have any experience in vaccine development. The reason I added that is because I didn't want this list to just be useful for near-term testing. I wanted it to be available to anybody who may need it six months from now in order to identify any people who may be able to help with later stages of fighting this virus. Having said that, there are a lot of companies and a lot of organizations building infrastructure for vaccines. I'm sure you're aware that earlier this week they've already started testing this in Seattle with one of the vaccines that's available. Hopefully it works.

I will say that vaccine development is very tricky. There are viruses out there that we still don't have good vaccines for. There's no vaccine for Zika even though there's a lot of interest in developing that. So when Dr. Fauci says that we are 12-18 months away from a vaccine, I think that's accurate, because it's not just developing the vaccine, it's testing, making sure it's safe and effective, and then mass producing it.

Alie: Right. And you work with mosquito-borne illnesses, you have in the past with Zika, what is the hope with the anti-malarial drugs fighting a virus?

Mike: Chloroquine, I think I've been hearing... I don't really know. I mean, chloroquine seems to be one of those magic drugs that works at killing everything in the laboratory. I have seen many different theories out there, some that have more support than others, experimentally, about drugs that could work. In fact, a paper just got published while I was waiting for your call in *Cell*, which is a huge journal. There's a certain clinically approved protease that helps cleave parts of the viral envelope, and in doing so prevents the attachment of the virus to lung cells.

But you know, I could also list a hundred drugs that will probably work on Zika. There is a bottleneck from what we find in a laboratory to what actually makes it to patients, and

there's a lot of things that can stop that from happening. It could be that the drug might work in a dish but the second you put it into a human being, it goes through their liver and it stops working. It could be that it actually causes more harm than good. There are some things that we look at in a dish and say, "Hey, it looks like this drug will reduce infection!" And it ends up that it makes you more prone to infection or makes you more susceptible to bacteria or something. So, there are all these different aspects of it that are very hard to predict. Chloroquine has been around for a long time, it would be nice if it works for this, but before doctors in the United States start prescribing it, there are probably other hurdles that need to be passed before they can start doing that.

Aside: I looked into this and the President has been ALL CAPS TWEETING about this anti-malarial that's also used for rheumatoid and autoimmune conditions like lupus. But according to an article in *Slate*, in his tweet lavishing hope on this treatment, Trump cited a scientific journal that only studied 20 patients and was not a controlled clinical trial. But, regardless, people are clamoring now to get this drug, with several reported accidental overdoses on it, while also leaving the patients who actually need it for autoimmune disorders not able to find it.

What is my point? It's cool your jets. Let's all cool our jets on this. So far, it's in the flimflam bucket until there's some actual proof of efficacy. Right now, what people need is to isolate, not get or spread the virus, and, for people who may be carriers, access to actual testing.

Alie: Now, what if people have items that they can donate from their lab, what kind of things are you guys looking for?

Mike: From what I've been hearing, the most precious thing is these viral RNA extraction kits. There are many on the market, but again there are very few currently available. We are trying to make that available to people. By having access to the database they can see which labs in their area actually have a kit available for them, and through the database they can make direct contact with that individual and ask: What kind of kit? Is it expired? Is it unopened?

Right now they really want unopened, unexpired kits. That could change, five months from now when they become more desperate for these kits. It could be that we don't care if it's been opened, we just really need this kit right now. I've anticipated that sort of need, which is why I didn't ask people, "Do you have an unopened, unexpired kit?" I just asked a blanket question; "Do you have this kit that you're willing to donate?"

Aside: Mike says that in the other section of the Google Form, people can say if they have PPE (which is not a disease, it means Personal Protective Equipment) that they can donate. Gloves, N95 masks, face shields. One physician, Dr. Josh Lerner, posted an open letter on his Facebook page today that went viral - or went epidemiological, I should say - in response to the CDC loosening their guidelines for healthcare workers on the front lines. I'm going to read part of his letter because it felt like getting kicked in the stomach by a horse, but it also woke me up a lot. So, Dr. Josh Lerner said:

Please don't tell me that in the richest country in the world, in the 21st century, I'm supposed to fashion my own face mask out of a cloth because other Americans hoard supplies for personal use and so-called leaders sit around in meetings hearing themselves talk. I ran to a bedside the other day to intubate a crashing, likely COVID patient. Two respiratory therapists and two

nurses were already at the bedside. That's five N95 masks, five gowns, five face shields, and ten gloves for one patient at one time. I probably saw 15-20 patients that shift. If we are going to start rationing supplies, what percentage should I wear precautions for?

Make no mistake, the CDC is loosening these guidelines because our country is not prepared. Sending healthcare workers to the front line, asking them to cover their face with a bandana is akin to sending a soldier to the front line in a t-shirt and flip flops. I don't want talk, I don't want assurances, I want action. I want boxes of N95s piling up, donated from the people who hoarded them. I want billion-dollar companies like 3M halting all production of any product that isn't PPE to focus on PPE manufacturing. I want Proctor and Gamble and the makers of other soaps and detergents stepping up too. We need detergent to clean scrubs, hospital linens, and gowns. We need disinfecting wipes to clean desks and computer surfaces. What about plastics manufactures? Plastic gowns aren't some high-tech device, they are long shirts, smocks made out of plastic. Get on it, let's go.

Money talks in this country. Executive millionaires? Why don't you spend a few bucks to buy back some of these masks from the hoarders, and then drop them off at the nearest hospital? We need to divert viral culture media for COVID testing and research. Netflix and chill is not enough, while my family, friends, and colleagues are out there fighting. Our country won two World Wars because the entire country mobilized. We out-produced and we out-manufactured while our soldiers out-fought the enemy. We need to do that again, because make no mistake, we are at war. Healthcare workers are your soldiers and the war has just begun.

That was a letter from Dr. Josh Lerner, who is a pediatric ER doctor. The folks on the front lines need help, and we can help by sharing info and making some noise so our government takes action.

Alie: What would be your dream in terms of who picks up the database? Like, what would be the best-case scenario of where all this information that you have now collected over the course of 50 hours goes?

Mike: I would love if this got into the hands of a federal agency, that they can then distribute to health officials at the state, county and city levels. I don't have that infrastructure, I do not know all these people throughout the country who may be in need of this right now. Ideally it would be something that comes from the top and trickles down to all these other agencies. In lieu of that, I'm doing my best to contact state officials, basically just cold emailing them and saying, "Hey, I have this thing you may need in the future. I'm more than happy to give you access. I just need to know who, exactly, needs it." That's honestly been the hardest part so far.

Obviously, the response from [checks numbers] 3,411 people came very quickly, but so far I've only been able to share this database with health officials in Massachusetts and North Carolina. I'm also working with a group in New York who has been using it because they're setting up organizational groups in New York to help recruit these scientists. And I'm also working with an organization known as End Coronavirus (EndCoronavirus.org) and we're trying to find ways to distribute this database to others. We've built this thing; I really want it to be in the hands of people who can turn this database into action. This is actually the first Google Form I've ever made, so I'm kinda learning as I go along on how to run this thing!

Alie: *[laughing]* This is 100% success on your Google Forms!

Aside: So, when in doubt? I don't know, make a Google Form! I'm feeling inspired as hell to make some spreadsheet databases, people. I also messaged my good friend, and your favorite diabetic diabetologist, Dr. Mike Natter, on how people could help. He said, if people have boxes of N95 masks, that would be ideal. If you see a healthcare worker in a coffee shop or bodega, offer to buy them something. (He clearly is a New Yorker.) Also, you can send electronic gift cards or food to hospital staff. I did that today with Dr. Natter's team and he FaceTimed me from the nurses' station saying thank you, which was completely unnecessary, but in the background one of the nurses stepped into frame in full PPE – mask, face shield, gown – and it was so surreal. It looked like a scene from a movie. And these people are literally risking their lives to save ours. Just, like, buy them a frikken panini, you know?

But Dr. Natter stresses that you should not go to the hospital to drop anything off. Contact the hospital via phone or email first to ask what you can deliver and how. But yes, electronic gift cards for dinner? Clutch. Now, I also asked y'all what you advised how to help in these times, and I put this up on my Patreon, and just a deluge of great ideas came up, so I thought I would read some of them off because there are so many things I didn't even know or think about! So, let's get right into it!

When it comes to donating something, what better resource than your own hot, squishy, sloshy bag of blood? Patrons Ashley Herbel, William Andrews and Aubrey LaBarre said hospitals and the American Red Cross are in desperate need of blood donations. "They've had to cancel donating events and a good chunk of their regular donors are 60 and older," Aubrey said. If you can, and it's safe to do so, please donate to your local blood bank. You can call ahead and ask about their protocol if that's a concern.

If you afraid of some needles, but not other types of needles, SEW WHAT? You can sew masks. A ton of patrons, including Jo Alexander, Shirley Dark, William Pentz, Amanda Richards, Maria Kumro, Heather Olins, and Laura Schulte suggest grabbing some nice-looking fabric, and looking up patterns online, and seeing if you can churn out some face masks. Now, are these cloth masks as effective as N95s? No! Of course not. But they're better than literally nothing. Some healthcare workers are being asked to use ONE MASK for days and days at a time in some hospitals, when usually they would be changed out after each patient. Natalie Mastick says, "My friend has been making masks for her husband and his colleagues in the ER. There is definitely a need for them." She recommends making some for some other hospitals but checking on their needs prior to dropping anything off.

Now, what if you don't sew, but you have a 3D printer? My cousin Nate Bronec is *[like a proud momma]* a bit of a maker himself, and suggested looking into the maker community pages and seeing if there are any face shield needs, locally, that you can help fabricate. He says that there are several groups that are trying to 3D print masks or face shields for local healthcare providers, so you can google that and I'll put a link to that in the show notes.

But wait, what's that? You have actual, real medical gear, just lying around, because you're really into some creepy cosplay? Or maybe you stockpiled, and you feel bad now. Don't feel ashamed – Zach Strickland, a patron, wrote in to say: My mom is an RN and a director of clinics for our rural hospital system. If you have any PPE you could donate – gloves, masks,

anything – contact your local clinic and see if they can use it. Masks do not have to be N95 to be of use to healthcare staff.

Eric Polk also wrote in and said: I'm an RN in emergency room - [*reverentially*] Aaahh! Thank you, Eric! - and I can confirm the need for PPE is critical. Masks are normally used once per patient and then discarded, but due to the current shortage, we are using the same masks for 12 hours. Countless patients. So please, if you have PPE contact your local hospital, it's a desperate need.

What about those close to you, like in your community? Well, patron Scott Sheldon says: I have several elderly or immuno-compromised individuals near me and I'm heading to the store tomorrow morning to get what they need. This isn't a blizzard to prepare for, it's a Winter or even longer.

Patrons Kathleen Sachs, Julia Hayman, Rachel Lynn seconded this.

Charmaine H wrote in with this great story, share your stuff! They said: I ordered from Who Gives a Crap at the beginning of the year and still had about 30-40 toilet rolls left, so I have divided them up and given them to my family members, as most of my family is classed as vulnerable and at risk of getting COVID-19, and I am disabled. So whilst there's not much I can do, I'm trying to find ways of helping them, and by giving them this toilet paper, it means they can now stay home. [*Seinfeld characters Elaine and Jane: "You can't spare THREE SQUARES?" "No! I don't have a square to spare, I can't spare a square!"*]

I'm down to... three rolls. But [*laughs*] I'll cross that bridge when I come to it.

Others mentioned to keep an eye out for WIC items at the grocery store. WIC stands for Women, Infants and Children and it's a program to make sure that food insecure kiddos and pregnant folks get the food they need. Adam Weaver said: Avoid buying things labelled WIC. We can switch to a different brand, but people who depend on WIC can't. So keep an eye out for that in the grocery store when you're buying things.

Speaking of vittles, if you can donate a little to a food bank, do so. I just found out today that \$100 makes 400 meals! So just think, a \$25 donation to a food bank could get 100 people dinner. Now, you can also check with your local ones to see if they're taking any items if you have extra stuff in your pantry. Tyler Q and Antonio Olivares, Kayla Simpson, Nadja Jackson, Chloe W all suggested this, and Adam Weaver simply said: Local food pantries are really hurting. Please donate what you can.

A bunch of patrons also suggested putting your money where your mouth ISN'T, and shopping local. Even if you're just getting gift cards or delivery from nearby restaurants, just to keep them in business. Heather McTurnan and Cat Lindsay both said, simply: Shop Local.

Chelsea is also doing this and Dale LeMaster wrote in and said: Being retired, my income is fixed, so I send checks to local small businesses for the amounts I would have been spending with them if not for social distancing. Keep calm and carry on loving and living.

Now, for a straight-up direct deposit effect on people, a lot of folks are Venmo-ing others who could use a little cash. Art T Lang is using Venmo, Michael Peskura says: I suggest visiting GoFundMe to look for campaigns to help your local restaurant and hospitality workers who have lost their employment during this miserable epidemic.

Nadine Duke says: I'm a waitress, or, was before four days ago, and my fellow service folk and I have got a lot of GoFundMe pages and the like, and we're all being very good about sharing each other's stuff on Facebook and Instagram feeds. Not many of us can afford to donate to each other, but we'll be sharing the hell out of each other. We service folk may seem like a bunch of degenerates, but damn do we have each other's back when the COVID hits the fan.

Megan Younce says: Yes, I love this so much.

Rob Hover said: The people who provide the support to those who work in office buildings likely need help too, like the incredibly kind shoeshine man that works in our lobby. Our office took up a collection, and with a lot of contributors, we were able to put together enough to help him scrape by for a week or so.

And what if you're like: "Ward, I am not flush with cash. I am freaking out about it!"? I get it, I get it, 1,000%. Now, if you wanna volunteer your time, for \$0 somehow, Chase Penix and Michelle Krebs started websites or Facebook groups where people can connect and share resources. You can also volunteer! Chris Caldarelli says Meals on Wheels needs volunteers. I checked with Meals on Wheels and right now they are really in need of food delivery drivers, as well as people who can perform welfare checks on older folks. Now, if you would like to volunteer but not see or get near other human beings? Understood. Meals on Wheels also said that it could also use people willing to write cards or create gift boxes to show seniors currently in isolation that there are people who care. Oh! You could do that, just contact Meals on Wheels.

Patron Mischa Kovalchuck says: If you're an ologist who wants to volunteer from afar, share your expertise with some kiddos via video conference!

Christa Avampato, a patron, said: I am chatting with a 4th grade class about biomimicry work. And also the non-profit Skype a Scientist (run by your favorite squid expert, teuthologist Sarah McNulty) is amazing at connecting braniacs with kiddos, so look into Skype a Scientist too.

Now, consider your skills. What have you, to offer others? Well, patron Helen Bobiwash has a lot and says: I volunteered to file income tax returns for low-income indigenous families. Although our government extended the tax filing deadline, low income families still need to file to ensure that they continue receiving the most benefits they can get. So, I'll file their tax return electronically and email them a pdf copy of their tax return.

Thank you Helen Bobiwash! That rules.

Let's talk animals. Patron, Nathaniel Cossey is doing whatever their dog wants to do. I second that, I'm holding my dog right now, as I record these asides. Ashley Curtin and Rob Hover say that shelters are closing down and volunteers can't be there, sooooo... consider maybe fostering a pet for a while! Maybe you'll adopt it? Maybe you won't. But foster it! Just dooo eetttt!

Joni Waldrup says: If you know someone who's in a more precarious financial position than you are, who also has pets, consider maybe buying them some pet food, or litter, or whatever supplies they might need. What a treat! Help Mr. Whiskers.

Now, how can we make sure that the humans who take care of humans are taken care of? Woo! Thank your healthcare workers. Ariela023 says that their mom is a nurse near Seattle (oof) and the nurses got a note recently, written to them from a patient, that was so heartfelt that her mom teared up. She said it felt so good to be seen, and something so simple helped them all keep going. So, consider writing a note to your healthcare provider, or fire department, or favorite small business and give them a “I see you, you’ve got this.”

Megan Guthrie and Zephyra echoed this, and Zephyra added: Also, please remember that in addition to doctors and nurses, healthcare is also leaning heavily on the less-visible people, who are equally important, like the dietary staff who feed our patients, and the maintenance and housekeeping staff who are working around the clock to keep up with the requirements to keep everyone as safe as possible.

That’s a great point. Zephyra also added: Wash your hands.

Another great point. So yes, take care of others AND take care of yourself! Let’s talk self-care. I was like: Patrons, what are we doing for self-care? Let’s talk about it.

Patron Esther Cohen says: I think self-care truly varies person-to-person. For some folks, it’s sitting and watching Netflix all day, for some folks it’s structure and scheduling. For me, setting a schedule with achievable tasks each day, and walking, walking, walking for hours on end has been soothing.

Kelly King has been rearranging furniture and has plans to paint the living room. And yesterday, while walking the dog, they made a short video tour and shared it to a mental health group they belong to, since, they say: I know many people are unable to leave their homes. A virtual walk, if you will.

Now, in terms of hitting the pavement, other patrons are like, “Heck yeah.” Mike Monikowski says: I’ve taken a page from how incarcerated people deal with being confined, by working out at home. And I’ve found that exercise actually DOES help with depression, it gives you something to do when you’d normally be doing something else. Even without equipment, there are thousands of exercise plans and video lessons available online for every level of experience and preference, ranging from calming yoga to calisthenics screamed at you by a drill sergeant.

And side note, may I suggest Jarrett Sleeper’s *Quarantine Calisthenics*? Every day at noon, Pacific time, my wonderful man friend is leading a workout on Instagram Live. No equipment needed, and he is usually in short shorts. So if you tune in, you’re gonna get a good workout, you’ll also see me in the background, or me leaving saucy, embarrassing comments as I work out in another room. So @Jarret_Sleeper on Instagram, *Quarantine Calisthenics*, every day, Pacific at noon. On Saint Patrick’s Day he wore one of my green t-shirts as a half-shirt and then he gave orders in a Leprechaun voice. Get into it. It’s a trying time. I love it.

Now, for a more mellow experience, Art T Lang says that they just get an early cup of coffee and go for a morning walk while no one is outside. And Kelly King says: I’ve been making sure to do yoga or tai chi daily for my mental health.

Heather Densmore says that their yoga class moved to the beach so that they can stay at least 6 feet away from each other. That sounds amazing! Now, if you’re not near a beach, but

you are near a screen, everyone says that online parties have just been getting their extroversion itch scratched! Stephanie Broertjes, Sarah Nichelle, juliebear, Jolie Brown, Angela Scarduzio, Art T Lang all say they are video chatting. The Google Chrome extension, Netflix Party, that's where all of your friends watch a Netflix thing at the same time and can comment on it. It's kind of like you're in a movie theatre only you're allowed to talk. And if you throw popcorn, YOU have to clean it up. There's also the Amazon Chime, Portal, or there's Zoom. You could always go old-school and FaceTime. I've been doing that!

What if you need to disconnect? No screens, you say? Write a letter, says Em. And Liz Roepke says that they have been doing this too, because it's always nice to just get a letter in the mail. And this way, you don't have to be on your phone to communicate, if you don't wanna be. Liz also adds: Anyone interested in an Ologies pen pal group?

If you're on the Ologies Podcast Facebook group there is an address-swap there, y'all can write each other letters if you like. I love that idea, I think it's cute as hell.

Now, Suzanne K chimed in to say, "I hope this is not too late!" Suzanne K, no it's not. Suzanne says: Along the lines of self-care I've been listening to a podcast called *Mindful 15*. Apps or podcasts that are guided to help with relaxing your body. Don't forget the beauty around you.

That's a great idea, Suzanne K. Maybe we can write a poem about it. Or you could journal! Mariah McGregor says: I've been journaling to both help me sort out my feelings, but also, in the after times, first-hand accounts will be helpful for future generations to understand the situation. Mariah says: Whether you donate the journal to an archive in 20 years, or just have something around to refresh your memory to tell stories to young ones, it's an important part of the historical record.

Wow. What a time we are living in! Will we want to remember it? Probably once some time passes. Concetta Gibson says: I started journaling specifically to document what's going on locally, and to sort through my thoughts, but it's done wonders for helping me keep track of WHAT DAY, even, it is. Other creative outlets are helping too, like painting and Minecraft.

You know what? Maybe it's Minecraft, maybe it's getting lost in comedies. Scott Sheldon says: It's okay to laugh. It's okay to laugh even at our current situation. Being able to uncontrollably cackle is a great medicine to boost your morale immune system.

You know what else is? Sparkly lights. Ben Bignell says: There's a thing people are doing in my hometown in Canada, putting up Christmas lights again so families can drive around without contact and enjoy family time.

So, as long as everyone's feeling lonely, and no one will see you for several weeks, there's never been a better time to cut bangs and text your crush. Grow out a moustache, or your pit hair, for fun. Or shave the back of your head. Shave the front of your head! Will Plewa says: I shaved off my beard so I can get fit-tested for an N95 mask. I was an ICU nurse a few years back, so I'm gonna be ready to get back in the trenches. It is a war, and well win it by working together, and I salute you all.

I also messaged with my good friend Colleen Flannagan – I've known her since we were 12! - and she's a nurse in Northern California. She's currently home on sick leave with what she calls, "a beast of a lung infection, a fever, and fatigue." She says it's worse than when she

got the swine flu and pneumonia. She's awaiting her COVID-19 test results but she's preeetty sure she's got it. I asked what people could do, and she sent me a link to a National Nurses United petition urging congress to help nurses get the protection they need. Colleen also sent me this message which was so beautiful and chilling. She said:

A little perspective for those who aren't sick and don't have to risk their lives and health at their job. Self-care and societal care advice. If you're not sick, feel blessed for your wellness. Don't obsess or worry about if you become sick. Don't obsess about getting a test if you're not sick. If you're sick of being outdoors, feel blessed you're indoors and not homeless. If you're blessed enough to have a deck, patio, window, enjoy your private fresh air. If you're blessed enough to be well, enjoy the extra time to do things you love and communicate with people you love. If you've ever wanted to try yoga, now is a good time. Good for the body, mind, soul and community. Thinking beyond ourselves is the key to getting through this in many ways.

And what does an ologist want non-ologists to do?

Alie: Is there anything else? If someone is not a scientist and they can't run these tests, is there any other way that they can help or donate? Any words of wisdom for people who are like, "I wanna do something!"?

Mike: Honestly, the best thing people can do is stay at home. We really need to be vigilant with our social distancing. I know it's hard, I know it's terrible. I mean, I've been wearing the same sweatpants for three days... I have been showering, so there's that! [Alie laughing] I know how difficult it is to be cooped up at home in this little dark room, just plugging away, and it feels awful. We're in it for much longer than three days, and we have the added anxiety of the fact that there's something going around killing people, potentially people you know, potentially people in your family.

So, I know it's tough, but the best thing to do is to just stay away from other people as much as you can, because so many cases are asymptomatic. I think the estimate from China is between 80-85% of cases were asymptomatic. This is not like other viruses. This is something that you can be infected for two whole weeks and have no idea, but that whole time you can be spreading it to other people. We have never seen anything like this in the United States, and it's my hope we never see anything like it again. So yeah, my advice to people is just to stay home. Watch your show on Netflix! [Alie, surprised, laughs] *100 Humans*, just came out the other day, I just saw that. Congratulations.

Alie: Aw! Thanks!

Aside: Ah yes... Me, wearing a lab coat I don't deserve to be in, asking strangers, on camera, about their toilet habits. I'm the real hero here, people. [pretend snobbery] Excited to hear word of my Nobel Peace Prize one morning between my breakfast margarita and my celebratory surf session. But really, other people CAN make a difference. You can make a difference.

Mike: We're really hoping that this turns into something. It really would be a shame if we did this level of organization and weren't able to turn it to action. That's where I really need our nation's leaders and our local leaders to help out at this point.

Alie: Yeah. And is there any flimflam, any myth about testing that you'd like to debunk?

Mike: I mean, there is something being spread by our federal leaders saying that testing is ongoing and there's no setbacks, that's actually false. We are not anywhere near the testing levels that we should be. You know, there are some silver linings to this. There are already countries that have done a fairly good job of keeping this under control and reducing the spread, so it's not all doom and gloom. We can get through this, but we really need to start behaving differently. We all need to stay inside, we need to be constantly washing our hands whenever you go outside and come back. Keep your distance from people, six feet at least. If you do have to go in public, try to keep that distance. I learned how to wash my hands as a result of this outbreak. I didn't know that my whole life I've been doing it incorrectly. [*Both laugh and Alie: "I know!"*] And now I know, like, "Oh yeah! You should probably clean underneath your fingernails by scraping them against your palm and ..."

Alie: Your thumbs! Who knew that you've gotta milk your thumbs? This whole time!

Mike: Exactly! I never knew that. I never knew I was supposed to be milking my thumbs this whole time.

Aside: Milk your thuuuumbs! Miiiiillk 'em! Milk 'em, and when you do, think of me standing right next to you, whispering, "Milk those thumbs." Who needs a 20 second song, right? Actually, thinking of a gritty little ditty...

Alie: Have you seen the John LeJoie, "*Thank God for the MotherF***ing Nerds*"?

Mike: No!?

Alie: Oh, I will send it to you!

Mike: I am a big fan of his, from his time on the *League*, and I listened to some of his albums back then.

Alie: Oh, you will LOVE his new one... It's literally talking about you.

[*song starts: "Thank God for the mother***ing nerds right now, thank God for the motherf***ing nerds. I'm not a very smart person, I don't know much, specially not 'bout viruses or like science stuff..."*]

Look it up. You will find it, and you'll say, "Wow, this is precious."

Thank you so much, Doctor, I really appreciate you talking to me!

Mike: Of course! No problem at all, thanks for the time.

So, ask motherf***ing smart people some motherf***ing stupid questions, and let's get through this together. Scientists, the [tinyurl](#) to the Google form is in the show notes, please hop in it. If you can help at all, please do that. You can follow Dr. Wells, [@MFWells5](#) on Twitter. We are @Ologies on [Twitter](#) and [Instagram](#), I'm [@AlieWard](#) on [both](#), and I'll have a new episode on Tuesday, I'm just cranking these mothers out. And that one will have no mention of COVID-19, but if you are thirsty for more info on this pandemic, my [Virology](#) episode with virologist Dr. Shannon Bennett explains the basics of the disease, and how it spreads, and she has a top notch back story! Whooo! Really one of the best I've ever heard. Now, that [transcript](#) is also live on my website at [AlieWard.com](#) in the Ologies extra page. Thank you, Emily White and all of the transcribers, for getting that turned around - I love you so much!

Also, my friends at *This Podcast Will Kill You*, the Doctors Erin from the Epidemiology episode released a [to the tune of "My Sharona"] M-m-m-my Coronavirus episode and they're doing a shockingly amazing six pack of minisodes, dropping on Monday, addressing all kinds of SARS CoV-2 issues. They are wonderful, and they are the originators of the Quarantini, so you can check that out.

Thank you, Erin Talbert, for adminning the [Ologies Facebook group](#), there's a thread there where people are sharing links to people or causes who need help. Thank you, Shannon Feltus and Boni Dutch, who host the comedy podcast *You Are That*, for managing merch at [OlogiesMerch.com](#). Thank you, Jarret Sleeper of MindJam Media and the mental health podcast *My Good Bad Brain*, for giving your whole day over to the production of this episode and [laughing] standing right next to me as I'm recording these asides. [Alie continues laughing. In the distance, Jarret: "You're welcome Alie, very much!"]

And as always, thank you to the wonderful Steven Ray Morris, of the dino podcast *See Jurassic Right* and the kitty-themed *Purrrrcast*, for scooting this to the top of the queue, he's staying up late tonight to upload it, and to master it last minute for us.

Nick Thorburn wrote and composed the theme music and he is in a great band called Islands, in case you need some new tunes to listen to in isolation.

In each episode I tell you a secret, and this week the secret is that I, to an embarrassing degree, can't stop listening to the new Grimes album, *Miss Anthropocene*. It's so good. So many good jams. Such good listening, and driving around, and walking around music. So listen to it. Maybe tweet at her boyfriend to start making some ventilators! I hear he's kind of a nerd. I heard he's a little bit of a tinkerer... so get in the garage, EGG HEAD! Let's figure this f***king sh*t out.

Okay. Tuesday, coming up, just a couple of days, new episode. I'll be swearing like usual. So, stay inside, lets kick this COVID in the rump together. Apart.

Berbye!

[Jarret: "I'm very proud of you, I love you, that was so good!" Single clap. Alie snort-laugh]

Transcribed by Rika Eringa, in social isolation, at her kitchen table, just feeling blessed and keepin' herself and everyone safe by staying at home and watching Alie Ward on Netflix.

More links which may be of use:

Scientists: sign up here: <https://tinyurl.com/COVID19SciVolunteers>

A donation went to: LAFoodBank.org

EndCoronavirus.org

[Sign the petition for nurses' protection](#)

Follow Dr. Michael F. Wells at [Twitter.com/mfwells5](https://twitter.com/mfwells5)

[American Red Cross](#)

[Meals on Wheels](#)

[Dr. Well's pinned tweet with form](#)

Have extra N95 masks? Let mask-match.com know!

[“The Value in Believing in Yourself”](#) by Spencer Johnson

[The incredible need for face masks](#)

[Kary Mullis obit](#)

[A primer on PCRs](#)

[Dr. Josh Lerner, MD letter](#)

[Slate article about antimalarials](#)

[Lesson plans for Brainchild on Netflix](#)

[100 Humans on Netflix](#)

[“Did I Mention Invention?” on CW](#)

[“The Henry Ford’s Innovation Nation with Mo Rocca”](#)

[Phil Torres’s “Jungle Diaries”](#)

[Veritasium videos by Derek Muller](#)

[Emily Graslie’s “The Brain Scoop”](#)

[Dr. Joe Hanson’s “It’s Okay to be Smart”](#)

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