Bret and Heather 13th DarkHorse Podcast Livestream\_ Herd Imm...

Sat, 10/9 12:36PM • 1:09:17

**SUMMARY KEYWORDS**

people, virus, hypotheses, question, strain, excess deaths, true, wuhan, case, suggest, virology, talking, herd immunity, emerged, deaths, viral particles, mutation, fact, discussion, likelihood

**SPEAKERS**

Bret, Heather

**Bret** 00:07

Hey folks, welcome to the 13th Dark Horse podcast live stream. I am here with Dr. Heather Hyang. As always, and we are ready to chat about some very interesting topics this week. Do we have any business that needs to be covered up front?

**Heather** 00:24

Not that I remember right now,

**Bret** 00:26

yes, I don't, I don't recall any business either. We're slightly thrown, we are seeing a brand new kind of error on our live stream, where else are apparently happening. And we cannot see them for some reason, no matter how we link up to the channel, but for the moment, it doesn't seem to be interfering with our ability to broadcast. So we're going to go as usual and hope that that clears up as normal. All right. So where should we start?

**Heather** 00:53

Ah, why don't you start with what you had in mind.

**Bret** 00:58

All right. Let us talk about the fact that for many weeks, in fact, since the beginning of this crisis, the question of herd immunity has been central to many people's thinking, and I'm watching something unfold over social media, where the consensus around the accessibility of herd immunity as a solution to the covid 19 crisis seems to be evaporating. And I think it's about time that it

**Heather** 01:25

did. So just say that, again, what is evaporating? The consensus that

**Bret** 01:29

herd immunity is actually the the road out of this crisis for us is evaporating, I think it's evaporating around several different concepts. One, the inflammation that once sick with SARS Cove two, one is immune going forward has not emerged, it's still probable that that is the case. But we really don't know that it is the case. And therefore, gambling on herd immunity is a mistake, because it's quite possible that people who've had this virus are going to be vulnerable in the future, and therefore, herd immunity is not even a thing.

**Heather** 02:07

Of course, without the ability to time travel, this always would have been impossible to know at this point, right? That there's just no way to know whether those who've been exposed and have antibodies now will in a year, six months, six years, any of those things.

**Bret** 02:21

Yeah. So there's that. And then I think there's a conflation that, in fact, herd immunity is desirable if it is achieved through vaccine. And in fact, that's basically what a vaccine does, it creates a kind of herd immunity without illness. So anyway, people have been thinking about this emerging naturally. And in fact, in places like Britain, they have experimented with it at the level of policy. But I think,

**Heather** 02:50

in the end, I think effectively, that was what was being experimented with in Sweden as well, which as we talked about a couple of livestreams ago, the numbers in Sweden versus their close neighbors, were are quite a bit higher, or something like six to nine times higher per capita, I believe, was the analysis that I had done. Then in neighboring Norway, I think it was,

**Bret** 03:17

right. So in any case, it's interesting that the collective wisdom around where we are and what the road out looks like, is changing. But at the same time, we're watching a kind of obvious fragmentation of our collective will to fight this together. I mean, we have two factions, we have a bunch of people pushing the idea that it is time to open things back up because well, I think they would, most specifically name the economic concerns. But they appear those who are pushing the open and backup now narrative, appear to have no awareness about how much danger we are in and how many unknowns remain.

**Heather** 04:05

It's really easy to want simple binary solutions, right? And this is, we've raised this before a number of times, but it's, it's in some ways a strange, it might appear to be a strange position for us to be in as people who have talked about the binary or strongly by modal nature of sex and gender, respect to play. But in general, in complex systems, you don't have clear binaries with clear boundaries between the categories, and certainly, you know, many weeks ago and with growing loudness now, there are calls to just open it up already. And just tell us what the predictions are. Just tell us what's going to happen. Well, we don't know what's going to happen. This is exactly the point. This is. This is a a cat. This is a new cat. To the show, actually, I think this is one of the others. This virus has no history with humans before, six or eight months ago. And so we do not know how it is going to continue to change. In fact, that's one of the things we'll be talking about here today.

**Bret** 05:15

Yeah. So we have to, I think we have to separate between two things, I think we have to separate between the binary maybe it's three things, the binary, the BI modal, and the complex that nets to some sort of a binary choice. So the problem is we do have a binary choice, in some sense, between two kinds of policy. There's one kind of policy that airs in the direction of caution of medical caution, epidemiological caution, on the basis of what we do not yet know, and the hazards that might lurk. And then there is another policy approach, which basically says, well, there is a cost to remaining on lockdown, socially distanced, and there is a cost to opening back up. And we think we know that it is certainly better for everyone, if we just open it back up. And there's a naive version of that, which is, this isn't so bad. And there is a sophisticated version, which sounds more like, you know, a lot of people are going to die from the depression that's coming to and we have to compare these two. But the real question, I think, is how I don't think our discussion is any good. Our collective discussion is any good yet. There's there are points here, which I know we need to be talking about that we are not talking about, I have yet to hear them anywhere. And I know that a rich discussion. That is a non polarized discussion, a discussion in which we all arrived with the intent to figure out what is best for us and us could mean Americans better if it means citizens of the world, but we could be having an important dialog. But the problem is this tendency for things to become political, which we've talked about before, is making it impossible to have the proper discussion about well, what do we actually know about where we are? And what does it imply? So one of the questions that I keep waiting to hear emerge, I hope it catches on from here, I guess is if you open things back up, you will create more infection, unless you're one of these people who believe that this is not a real thing. Those people are crazy, as far as I can tell. But

**Heather** 07:41

just to be clear, the this isn't even a real thing. faction is different from Yeah, it's real. But I don't know where it came from, or I think it came from this or it you know, there are a number of hypotheses over in the mainstream narrative looks like a cover story, or is at least covering the fact that we don't really know and there's a whole lot of possible hypothesis space in there, which we've talked about a number of times here. But at the far end of, of possibility space is this isn't even real. Have you even met anyone who has come down with COVID-19? Right.

**Bret** 08:18

And, you know, let's put it this way. I think we always have to leave a category for what I would call the on thunk. That is some way that things could be unfolding as we see them through some mechanism. We haven't yet entertained, but but that's not a very high probability. We have a Coronavirus, circulating it seems to be causing a disease we call COVID-19. It seems to have emerged from Wuhan through whatever mechanism and it's causing a pandemic that involves an awful lot of people having blood clots, strokes, heart attacks, lungs, filling with goo, all sorts of these pathologies we've discussed. But all right, let's get back to the question. There is a virus that appears to be new to this human population. That means it is inherently experimenting with mechanisms to transmit itself from one person to the next. It is experimenting as we've talked about on this podcast before what all evolved creatures are trying to do is lodge themselves as far into the future as they can. Basically we're all trying not to go extinct. And so the farther you can launch yourself in the future, the better off you are

**Heather** 09:39

going to say I like I like the language that we've used before a little bit better that it is exploring space it is exploring possibility space, as opposed to it is experimenting just because experiment. You know for those people who are listening and not watching and can't see your square quotes, square quotes, scare quotes around experimenting. This is not we're not talking about human experimentation on the ground. A virus which very may very well may have happened, we're talking about the virus itself. Basically exploring space into which it can successfully move and thrive.

**Bret** 10:10

Yeah. When I say experiment, I mean it in the same way that we would say natural experiment. You know, Hawaii is a natural experiment in invasive species, right? Nobody set it up that way. It just, it allows us to test hypotheses by looking at the pattern. So the, whatever our language choice is, there's a question about how effective this virus is going to be. In moving into the future, we humanity are presumably all united with the intent to give it as little room to get into the future as possible, we would like to end its interaction with humans as quickly as possible. One of the factors that dictates how successful we are likely to be is how much area how much area in design space, it has to explore new combinations of things. And to the extent that we are divided over the question about whether it's time to open back up, the group that is pushing a quick return to normalcy is effectively gambling on all of our behalf on the extra space that the virus will now have to discover ways of persisting in the human population. So we talked in an early live stream, about one very bad possibility here is that this virus becomes a fellow traveler, with humans indefinitely, like another flu. Now, if it became less dangerous, and than it currently is, than it currently is, and became persistent, that would be a devastating blow, it would not be a fatal blow to humanity, but it would be a huge setback. And you would have to put the losses that would come from having a second flu like phenomenon circulating in humans, you would have to stack them against the cost of remaining and locked down now. And the problem is those costs are effectively indefinitely large because the future is indefinitely long. And if it becomes a permanent feature, then those costs will simply mount every year. Yes, they will become normalized, right? So we have to think in terms of what is our best chance of taking this thing that is now spread far and wide, and preventing it from spreading further, keeping it in as few bodies as possible. So it has this little room to discover new ways of infecting us as we can manage is in the long term. Surely, right. So in any case, have you heard anybody else? Say that, that we're trying to reduce the amount of evolutionary space it has to discover?

**Heather** 13:12

I don't? I don't think so. But you know, we spend a lot of time talking. So I've certainly have heard that my own house,

**Bret** 13:19

yes. But how do we lodge this in the public discussion so that people, when somebody suggests, hey, it's time to open it back up, you know, crashing an economy is nothing that you have a right to do? Yes, there are going to be deaths, but they're always deaths, these arguments that we constantly hear in favor of opening it back up, ignore the harm we are doing to ourselves in the distant future, if we give it too much room now,

**Heather** 13:44

wellness, I mean, this is always the case with with, with policy, that it values the short term over the long term. And it is always true, that those things that are evolutionary successful, are successful, because they have managed to, yes, survive the short term, but launch themselves into the future. You know, in the past, they launch themselves into the future. And there are very, very many strategies and lineages that failed to do that, which we now have, you know, either fossil or much more likely no evidence at all they ever existed. So I think I think it will be very hard to successfully lodge a popular argument and I don't mean that popular as compared to unpopular but an argument that gets good traction in in mainstream space. That sounds like we need to block access to extra niche explorations next, niche exploration space for the virus. That's just that's not going to play. But talking again, I would say you know, you would, you would be going to talk about the distinction between binary and bi modal and complexity space and I think you know, might if we're going to do that It might be worth actually defining our terms. Sure. But it is also true that lockdown versus no lockdown is a false choice, that this is a dichotomy that no one should be actually finding themselves on. And it is, you know, as I said, a few livestreams ago, I feel like we are in this seussian landscape of star bellied sneetches and sneetches without where people have begun to label themselves, you know, the, the magga hat from the 2016 election was an obvious label, it was an obviously obvious star in your belly, to identify, you know, I like you, I don't like you, or vice versa, whatever it was, right. And now masks in stores where they're not mandated by the stores is becoming that, and that is frickin dangerous. So using external markers of tribal affiliation is both a very human and very dangerous and we can be better than that. And also, we need a more nuanced discussion of what easing restrictions, while still remaining cognizant of the hazards might look like. So the idea that masks is succumbing to fear wearing masks coming to fear, and, and trusting the mainstream media. That's, that's batshit crazy, right? That doesn't make any sense at all. But it's hard to lodge that in the current environment, how about, we can begin to allow people to, you know, in places like Michigan, to actually shop for seeds, and to, you know, do things that are actually going to help them help help help some of the academy come back alive, and help them keep their mental health and actually move forward into the world into the future as complete humans as opposed to shells of humans, as opposed to treating this like a, you're basically everyone's in quarantine versus no one's in quarantine at all. Those those don't make sense as alternative choices.

**Bret** 17:10

So part of the problem is that we function at many levels, some of them official, and some of them not official, as a representative democracy. We are supposed to be represented in our epidemiological interests by a scientific community who is supposed to speak for us. And unfortunately, we are now seeing on many different fronts, these communities corrupted by obvious economic influences. We see them, frankly, covering their own asses, and therefore not able to tell us what we need to know. And increasingly, I mean, especially I, you know, do not have a deep connection to the virology community. I'm really mostly becoming aware of who the big players are in this group. But I'm finding almost nobody who is still officially sanctioned by the major institutions, who is not telling what appear to me to be obvious fictions about where we are. And it's not to say that most of what they say isn't true, but it's to say I have a very hard time taking them seriously when they're telling me things that if I go put on my biologist hat, and I go research on my own, turned out not to be wrecked.

**Heather** 18:34

So I'm sure I mean, I think I have some sense of what kinds of things you're talking about, but I'm sure that people will want to know what specifically referring to but the seam is a decent place to segue into just a comparison, and this isn't virologists. But, Zack, if you want to put this up on April 30, the intelligence community for the United States put out a statement on the origins of COVID-19. And it's very short, and it reads as follows while the Office of the Director of National Intelligence today issued the following intelligence community statement, quote, the entire intelligence community has been consistently providing critical support to us policymakers and those responding to the COVID-19 virus which originated in China. the intelligence community also concurs with the wide scientific consensus, the COVID-19 virus was not manmade or genetically modified. As we do in all crises, the community's experts respond by searching resources and producing critical intelligence on issues vital to US national security. The ISC will continue to rigorously examine emerging information and intelligence to determine whether the outbreak began to contact with infected animals or if it was the result of an accident at a laboratory and so they are saying consensus, they agree with it, what they view as the scientific consensus that it was not manmade or genetically modified. And then they say, but we will continue to take in new information which is admirable and frankly completely necessary to investigate Whether it's infected animals or might be the result of an accident at a lab in Wuhan, that was on April 30, at the same moment, hold on take the screen down for a second sack. Well, I find this at the same moment. Science magazine was reporting that, okay, you can put it back up. The NIH, which is the National Institute of Health, the major player and funding of medical research in the United States along with the NSF, NIH is axing about Coronavirus, grant a, quote horrible precedent and might break rules. Critics say so same day, as the intelligence report comes out, there was a report and one of the two biggest scientific journals in the world. That is, you know, it's a journalistic report reporting on the fact that one of the giant NIH grants which has been extinct for six years already, and which supported collaborative research between the US and China on bat coronaviruses has been pulled. It's not clear from this article, whether or not that's a legit move. I don't think legal is an appropriate terminology here because these are, it's a federal granting agency, but you know, presumably has some law oversight.

**Bret** 21:14

But probably there's language in it that allows them to withdraw it at any moment,

**Heather** 21:17

right. But cert seems to be unprecedented, and certainly breaks at least some rules of their own internal internal language and the expectations that people who get grants p eyes and their their associates certainly never expect to have their money pooled mid grant stream, you know, all grants have some amount of tenure to them. So amount of time during which they progress. And many grants are expected to be able to continue for further rounds if they apply for them and have made appropriate progress. In the interim. I don't know any of the details of this particular grant. But how interesting really, that within the US on the same day, the intelligence community, his official position is this is fine. You know this, there's there's nothing to see here, folks. There's nothing there's no man behind the curtain. In fact, don't even look at him. Don't even ask if there is one. That NIH pulls funding for a long standing effort to study coronaviruses in bats, that is a collaborative effort between the US and China.

**Bret** 22:23

Yeah. So you can see that that juxtaposition makes no sense from the outside. Exactly. There's nothing about this that requires detailed scientific knowledge. This, the intelligence community is saying one thing with absolute clarity, and we are behaving very differently at the level of what kind of work we are funding at the same time. But even more disturbing, I think, is the fact that the virology community that is the sanctioned tenured research, one university virology community is monolithic in its embrace of the idea that this is an unmodified virus that came from nature, while people who are not part of that community, but are expert enough to navigate much of the data that is available to us in the public, are reaching very different conclusions. Now, I want to be super careful here. As we've said before, we are not going to advance conspiracy theories, we will advance conspiracy hypotheses because that is the nature of these things

**Heather** 23:34

hypothesized by advance also, I mean, we probably don't want to get into the business of dissecting every single word that we choose to use, but by advanced, you mean discuss. And as evidence mounts for any above others, we will speak about those that seem to be less supported less often, and those that seem to be more supported more often, while still maintaining that they are in fact hypotheses for which evidence could come forward that would falsify them and let's drop them off the list of plausible explanations.

**Bret** 24:04

And you know, for those of you who are new to the game of theory, you should understand theorists do not generate theories you cannot you can generate hypotheses and at the point that they become supported so that they are the assumption that they is that they are true, like the earth goes around the sun or that, you know, the information that allows heredity in morphology comes through DNA. These things then become theories at the point that they are they're not immune to being falsified, but they become the default assumption. So, we will offer hypotheses, we will advance them in the sense of putting them on the table. It doesn't mean that we back them. I have to say I am still rooting for the idea that somehow this is a natural virus that escaped without the scientific community's involvement. As a scientist. I want that to be the case. But I have to say The evidence that that's what happened is amazingly weak. The narrative is very strong. But this is such

**Heather** 25:09

a critical distinction. And it you know, it gets at the naturalistic fallacy, the idea that what is is not what ought to be that good scientists good. Everyone who are trying to understand things in a scientific way, may well come to believe that something is true, while simultaneously wishing fervently that it weren't not true. These we often find ourselves in this position. It is indeed, exactly why we argue, actually an evolutionary perspective on humanity and on the entire world is exactly the thing that you need in order to change those things that evolution has handed us which are not beautiful, or wonderful for us.

**Bret** 25:49

So what are we to make of the fact of those who are in the best position to advance our interest and the best position to understand what is taking place appear to be monolithically subscribed to a narrative that does not stand up to scrutiny? In other words, it may be that many of those people believe this is a natural virus, but their certainty that that's the only way this could have gotten into humans in Wuhan is simply unjustified by anything I've seen anywhere.

**Heather** 26:24

Yeah. Well, the NIH just pulled a grant. Dr. Kyle sitel, who we talked about in an earlier live stream, lost his position at the hospital where he was working for the crime of going on YouTube and talking about his suspicions, that the treatment with ventilators was not the best treatment for patients. The video by the current county doctors, which I basically eviscerated a couple of livestreams ago, I don't think they were right. I don't think that their analysis was good faith. But they absolutely need to be able to have voice that was pulled down from YouTube. There are there are a number of frankly, crazy conspiracy theories going around that keep on getting pulled. So there's there seems to be widespread effort by the sensors, which are in the case of NIH federal sensors, and the case of YouTube private corporation censors. To keep us keep us on the straight narrow, no keep us on a particular narrative. So who who wins by us all talking about and coming to think that we're sophisticated for not paying any attention to the other hypotheses? Who who wins by by having the space of possible explanations winnowed to a single one, which, frankly, for those of us who are trying to understand what's going on, that single explanation is looking less and less likely to be true. Yeah, I just turned the question around on you at some level. But I also just, I was trying to outline all the places we've seen all the mechanisms by which we seem to be seeing dissenting voices silence. So at one level, sorry, before I turn that back over to you, at one level, this simply could be it's that kind of coercion, that people can look around and say, Oh, I see what happens to those who asked the questions or who, or who ruminate online, about things that aren't within the narrative that has been accepted. It's not worth it to me either. You know, I either feel like Actually, I'm doing important work here. I'm a health care worker who needs to keep on doing the work I do. So I'm going to keep my thoughts to myself, or I'm a virologist, with with a 10 year or not even 10 year yet, and I can't afford to lose my position. So you know, it's it's really easy to imagine that this is about courage or not. But of course, it's not that simple.

**Bret** 29:00

Well, it's not that simple. I think most people just simply don't understand. We all know, on eBay, for example, there is a perverse incentive towards positive reviews. So if somebody you know, has 95% positive reviews on eBay, you know, something's probably wrong, because that's pretty low. So, we have similar networks inside of academia. And it is not obvious from the outside, but the degree to which a virologist who was not absolutely on message. Well, what I was going to say was top tier in terms of their security would be very vulnerable for stepping out of line if the perception of the community is our well being into the future. Depends on the story. Not to be We screwed up, and we created one of the largest historical errors ever, right? If this is a, you know, it would be an error, presumably, or most likely it would be an error on some given day where some person slipped up in some procedure, and this thing escaped into the world. But now we're dealing with a global pandemic, we're dealing with the likelihood of hundreds of 1000s, or maybe eventually millions of deaths. This is a major error. Right? If the virology community is in some way responsible for it, then we don't know what virology will look like going forward. And that's a very strong incentive for people, frankly, to convince themselves that the official explanation the nature path, or whatever it is, is the story and that everybody else is a conspiracy theorist.

**Heather** 30:53

So we get to Bob Trevor's concept of self deception being much more powerful than simple deception. It's far easier to lie successfully, if you will first lie to yourself about what it is that you believe,

**Bret** 31:05

right? So as a countermeasure, what I would suggest, and if I can actually just go back to something you said that I think we need to emphasize, there is a lot of conspiracy stuff circulating around COVID-19. Most of it is garbage. Some of it is partially garbage. And these are the toughest ones to deal with. Are the partial garbage, partial garbage ones where a hypothesis is offered, it may contain a degree of the truth or it may contain the truth, but it is coupled with things that are absolutely untrue

**Heather** 31:39

that may match your priors in some regards. And you think, Oh, yeah, right. And then they say something that you know, is wrong. I think, Well, how do I match these things up? Because there's a whole lot that I can't assess on my own from first principles. I know some of these things are true, and other people aren't talking about them. I know this isn't. So how is it that you separate the wheat from the chaff?

**Bret** 32:00

Right. And in general, for me, as somebody who finds I must go look at these if I'm being told that this couldn't possibly have emerged from the Do you know, how many labs there are in Wuhan that study? coronaviruses from bats?

**Heather** 32:15

120? I did not know. Yeah, I

**Bret** 32:20

know, I found that kind of shocking. One of them is actually a couple 100 meters from the fish market. I mean, it's how is that not a famous factor? Maybe I've been lied to maybe that's not even true. But I certainly read an analysis that provided a map that showed this

**Heather** 32:37

right? Well, man, we've all got a friendly neighborhood virology lab just down the street. Well, that's

**Bret** 32:42

the other thing. And in fact, one of the better analyses that I've seen started with the question of Okay, yes, it is surprising that that there is a virology lab in Wuhan that studies, Corona viruses from bats, and that this epidemic started there. But the first question was, well, maybe these things are all over the place. And so that's not that surprising, right? They're not all over the place. Okay. There are two biggies, right? One in the US.

**Heather** 33:07

But let's just asterisk that maybe these things are all over the place. And therefore that's not so surprising. This is so important. This this is the step that is often missing, when people start promoting conspiracy hypotheses as it were, right? The actually what is the expected value don't so don't assume that the fact that these two things being in close proximity to each other is unlikely until you know, the frequency of the one thing that you think shouldn't have shown up there. And if it were true, that there were one in every city over 250,000 in China, then its relative proximity to market that sells fresh food is completely unsurprising and warrants no discussion at all. And you know, I'd love to see the goodness of fit test the chi square whatever, to do know whether or not the, these two things that you know, the fish market and the virology lab being in relative proximity to one another is unlikely compared to other cities of comparable or larger size, I think would be the right analysis for Wu Han. But suffice it to say that the fact that the question was even asked, and that the answer apparently without any numbers to it came back with like, Oh, no, actually, these labs are quite uncommon, tells us okay, well, at least they passed that first step of this is this seems to be unlikely.

**Bret** 34:29

Yeah, seems to be unlikely at an extraordinary level. I mean, I must say, if I can just remind people of the story, we discovered that there was some pandemic about to unfold. When we emerged from the Amazon in late January, late January, we were in Ecuador, and there was one case thought to be in Ecuador. And so it came across our local Twitter feeds. And at that point, I looked at it and I was not happy to discover that A bad had been implicated as a bat biologist, I always feel, you know, it's kind of a loss when more is added to the reasons to fear bats. And anyway, but I looked at it and it looked pretty plausible that this had come through the fish market through the sale of bats. And when I tweeted that this looked reasonable to me, I got back an immediate influx of people showing me a Chinese job advertisement for a virology lab in Wuhan looking to study coronaviruses. Now, of course, I don't speak Mandarin, I couldn't evaluate whether what I was seeing was actually even a real document, much less what it said. But I suddenly knew that there were things about the story I didn't understand because it is an amazing coincidence for there to be a virology lab study and Coronavirus is in Wuhan for the epidemic to have started there and for them to have been advertising for people to study these exact kinds of questions. So I backed immediately off of that, and I have to say, in the period of time, since then, it has not gotten more likely that it was the fish market, the more you trace down the various possibilities, the less likely it looks. So I was gonna offer one suggestion going forward, and I've done it myself. And I would suggest everybody who is interested in these questions, do it also, which is you make a kind of flute flowchart of the various different possibilities in play. Unfortunately, we've been given an artificial, it's either natural, and it came from a bat with no lab involvement, or somebody designed this virus, you know, in some extreme form, and there's lots of intermediate possibilities. But I would suggest you map them all out so that they're all on a piece of paper. And then you put percentages based on what you know about the likelihood that it came this way, that way, and you fill the thing out as much as possible, and then you put a date on it. So that you know, as of this date, this is where I understood the likelihoods to be and you don't stick to it. You know, again, I'm still rooting for the natural came from nature without the involvement of a lab hypothesis, I just don't think it's very likely to be true.

**Heather** 37:11

So do you, you have this flowchart that you made it that you wanted to show or or now,

**Bret** 37:15

we could do that. And I just I want people to understand I don't want to live or die by whether or not this flowchart generated yesterday and today is accurate. Again, I'm rooting for it to be wrong. And

**Heather** 37:27

I'm just I haven't seen it yet. So this, this could be interesting. Let's see it together. If If you can show it on our big screen to us, so I can see it.

**Bret** 37:36

Might have a copy of it here.

**Heather** 37:39

Well, actually, if dad has a copy that's Zach, our producer and our son.

**Bret** 37:48

So wait, Zach is our son, which makes us his producer? True, right? Yeah, I'm pretty sure that's

**Heather** 37:55

a curse it for sure. Yes. Okay. Oh, great. Oh, except we can't really read it.

**Bret** 38:00

But you have a gret? Goodness, that is terrible. Can you fix that at all? Zack? No. Well, is that supposed to be a PDF? All right. Well, I guess we can't really show you that in any sort of decent form. Okay,

**Heather** 38:13

let's, let's take it down then and, and come back to it when we have a better image. Maybe next time.

**Bret** 38:20

All right. So let's just say you all saw what the image are, you see what the image looks like, roughly, the bubbles contain various possibilities. And the little percentages in between are an estimate of the likelihood that it went one way or another and the total should be about 100%. Because it could be somewhere on the flow chart is the actual path it took to humanity.

**Heather** 38:44

You want to switch gears and talk a little bit about excess deaths. Sure, yeah. Let's

**Bret** 38:49

talk about excess death. This is a this

**Heather** 38:50

is a concept that you've raised a few times, or we've raised a few times. I guess let me let me set it up for a minute before you before you talk a little bit about it. My saying that much has been made of late by those who are advocating for an end to lockdowns and have returned to normal return to normal and quotes that we don't have an accurate count ounce of deaths or have underlying infection rates, which has been one of my drum beats that without without widespread testing, we don't know underlying infection rates and therefore we do not know we can't possibly have an accurate case fatality rate or infection fatality rate. But some people are more likely to be on the right than the left at the moment unfortunately. By unfortunately, by which I mean unfortunately it's polarized politically this way. Some people who believe or want us to believe that the threat of this virus is being overplayed will say things we use the language of you don't die with a disease you die of a disease. And this is prompted by I think it was Dr. bricks. It was on the Coronavirus Task Force saying that at the moment You have tested positive for COVID-19. And you die that is being slated in the official death tolls as you died of COVID-19. And some people have said, That's ridiculous, you don't die with you die of. and and you know if if if that critique is true, it would skew the death toll higher towards COVID-19. Right. But this is dealt with, I think really well by the concept of excess deaths. So you want to speak to that? Sure.

**Bret** 40:31

So you can imagine that there's some sort of fluctuation in the amount of death that you will see at different times of year, winter is harder on people, you'll have more people dying during the winter than when times are easy, something like that. But by comparing one year to the next, so you take a given week, you know, first week in January, let's say, and you compare how many people died in this municipality, this year, versus next year or last year, you see what the change is over time, and you'll get some sort of noise, you know, some years you have a few more deaths, some years, you'll have a few less, but in general, you'll have some sort of expected level of death. And then you have some major event like the covid 19 pandemic. And you can compare in the covid 19 pandemic, you have this many people die in a given week in question, compared to what normal would look like. And you say, Well, we've got, you know, 270 extra deaths that are not expected. Which, of course, doesn't mean it doesn't there are two things It doesn't mean one, it doesn't mean those people even had COVID-19, some of them may have died from consequences of COVID-19 that were not direct, like they didn't go to the doctor when they had signs of a stroke. And that killed them. So it may be a consequence of COVID-19. But not a consequence of not a path all pathological consequences of it in the individual. Right. So in any case, I had a second category I was looking for. I don't think you said it yet. Yeah. What was it? I don't want to be in a second. But But by and large, the important thing is, oh, there's also, you know, noise, you could have reasons that people would there be there could be other on unknown reasons that you would have excess destiny year that would tend to be attributed to COVID-19. Because COVID-19 was the big factor everybody was thinking about. But by and large, that ought to be a small factor. Either that or you want to see the yearly variation is actually large, in which case, you're what we would call would be large, meaning you weren't very confident of the the usual baseline. But anyway, excess deaths is a good way of capturing that which is hard to parse, specifically, how many people are dying as a result of COVID-19. We can estimate it may be better with excess deaths than we do with any other metric.

**Heather** 43:03

Yeah, exactly. And I wanted to add just one thing to this, which is that the concept of excess deaths, the statistic of excess deaths, how many people died in this place at this time, compared to the deaths per capita at this place exactly a year ago to control for seasonality and compare it to control for geography. Then this will find potentially other syndromes that we meaning epidemiologists, neurologists, medical health professionals, are not yet attributing to Coronavirus. So Zack, if you would put this up, there is a strange new terrifying inflammatory condition in children pediatric cases, which is not tending to kill children, but it is tending to leave them extremely sick and with who knows what level of long term consequences. So in this particular case, there are there are strong suggestions that that this pediatric inflammatory condition is indeed caused by Coronavirus. And so you've got people looking into whether or not these children who have this many of them either test positive now or test positive for antibodies suggesting that they've been exposed to the Coronavirus in the past. That that itself is a little alarming and it's in keeping with other things that we know about the progression of this disease and many people when you get sick, those people who aren't asymptomatic, get sick and seem to be getting better and then plummet and then have some strong respiratory problem that causes causes them to in some cases die in some cases require ICU. So the fact that this is you can take that down, please. The fact that This is found in children who have antibodies to SARS Cove to but don't currently test positive, again suggests that a there may be longer term consequences of the progression of this, these might be maybe a much longer arc, then people are imagining that it's not like you get better and you're done. But also, this, you know, if children were actually dying from this, which it looks, you know, thankfully like children aren't actually dying, but they are getting very sick. And we didn't yet attribute to this to possible Coronavirus effects that would still show up under excess deaths. And this may well suggest that there are other things like for instance, strokes in otherwise healthy, relatively young people, people in their 30s and 40s, who are suffering from strokes and very much higher levels right now. Well, is there something else that's going on? That's explanatory, or is that somehow linked to SARS Cove to? Either way? It's a scary answer. And it'll show up in the excess deaths count in a way that other metrics don't have a way of revealing.

**Bret** 46:05

Yeah. And it is a good it's a good integrative measure that, to the extent that we're trying to figure out why policy wise what to do, if we can go back to the discussion we were having at the beginning, it's really, perhaps the key metric for actually capturing the hazard at least as far as it manifests and deaths. And as you allude to, that is not the only frightening thing here. It's not that if you get better, you're better. The fact that large numbers, or a large fraction of people even who've been asymptomatic, have visible pathology on their x rays, after they've recovered, suggest that this may indeed be a very dangerous life shortening condition, even for the lucky ones who show no symptoms. Yeah.

**Heather** 46:52

Well, there's a number of other things we could talk about here. You have any preference between timing, more virulent strains, or talking about relative risks?

**Bret** 47:07

Well, more virulent strains is certainly worth talking about. Okay. And maybe we should mention the Johns Hopkins statistics, which, frankly, I find so shocking that I feel there might be something wrong with them.

**Heather** 47:21

I don't have them up here. Maybe well, maybe we can mention those in the q&a, because I don't use them to be my phone. So I don't have them on the computer. Sorry about that. Um, so let's say you want to talk about a new strain with hyperlinks. So let's see, this is LA Times reports on a new study, I haven't actually looked at this much, which is not pulling up because our internet is slow. Okay. I'm not sure what to say about this, because we don't have anything on the screen here.

**Bret** 48:00

Yes, there's nothing on the screen there. Well, let's see,

**Heather** 48:03

there's some there's some evidence that out of Los Alamos, some researchers at Los Alamos that there are, as we've talked about before New, multiple strains, and that some of the strains that seemed at least one of the strains that seems to have traveled from Europe to the eastern seaboard, in the US in whenever that might have been estimates vary, is a more virulent strain than the first one that was emerging in Wuhan in December, November, December of 2019. And this is, again, an idea that has been widely dismissed by some odd there aren't multiple strands. And that, you know, this, this raises the question of, well, what what makes it a multiple up? What makes it a different strain? Clearly, the things mutating, it would, because it's, it's made of RNA, it's going to mutate, and at what point is it mutated sufficiently that someone has decided to call it a different strain? And we were more familiar with this over in non viral organisms space, when we're talking about often invertebrates. At what point do you call it a different species? Well, it's a judgment call. And the experts within that clade of organisms get to decide when we call it a different spaces, and when we don't, and sometimes they reverse their decision. And they say Actually, we think actually these these two things that we were calling different species, or one or more often vice versa. So with regard to a quickly evolving newly emerged virus that the world has never seen before. At what point is, is it changed enough from its original that we're calling a different strain at some level. I don't even find the question. Very interesting. But you know that what do we call it? Yeah, but the has it mutated and are some of the lineages from the original one more virulent than others, they would have to be Well, let's have to be very incent virulence.

**Bret** 50:02

Let's try to correct this. So people understand what's really taking place. And why this why the question turns out not to be a good one, right? Yeah, it's a very important one. But question of how many strains strains are there. Here's the thing, let's say you've got COVID-19, or you've got SARS, cov. Two and are suffering from COVID-19, you undoubtedly have multiple strains in you, right? There will have been mutations that will cause differences, most of those differences won't change anything about the way it functions. So we'll never notice that there are differences. And most of those changes will die with the end of the infection that you have. So some new strain comes into existence in some individual, and then that person gets better and there are no live viruses left. And that strain came into existence and went extinct. without anybody recognizing it. That's happening, I would bet in every single patient. I mean, they're just simply, Boy, am I going to get this number wrong. I would guess there are hundreds of billions of copies of the virus and every sick person who has had the disease long enough for it to get to all the tissues, it's going to get to go, boy,

**Heather** 51:12

I have no way to estimate that number could be trillions

**Bret** 51:14

could be many

**Heather** 51:16

orders of magnitude

**Bret** 51:17

Yeah, or does a bank. But let's just say let's be conservative, let's say it's many millions, okay, chances that all of them are identical and have not had a mutation are pretty low given the way mutation occurs. And the chances that the one that has the mutation escapes to the next person is pretty low, given that most of them will be identical or near identical copies from the original. Occasionally, a mutation will jump to somebody new, but very often, that mutation won't change anything about the functionality, so we won't notice it, and then it'll go extinct in the next person. But every so often, the virus will accidentally innovate something that makes it more effective than its ancestor. When that happens, the chances that it does persist to get into the next person goes up, which doesn't mean it will make it but it does mean that chances are greater. So at some point, one of these lucky changes will make a leap. And when it makes a leap, the lucky change will make a second leap. And as it fans out into more and more individuals, the chances that that new slightly better version will take hold and be in a an effective new patient zero, right? A new patient zero for that new strain. That then fans out to a bunch of people is fairly large,

**Heather** 52:39

can I do another potentially obnoxious semantic thing and cetera, he used the term better, which will be grabbed on to by the critics, to suggest that you think it's better when the virus becomes what more virulent or awful to humanity? What is what does

**Bret** 52:56

better mean? To me?

**Heather** 52:57

Right? It means I'm just I'm trying to play your foil here.

**Bret** 53:01

Yeah, no, I think I think it's useful. So a, you should know, personality defect. I very much dislike this virus. But it's not that I don't admire the beauty of its design. I do. I'm not rooting for it.

**Heather** 53:13

Yeah, but you don't want the virus lovers out there getting on your case,

**Bret** 53:17

I'm perfectly capable of really disliking mosquitoes and finding them fascinating and an admirable feat of inadvertent design. But in any case, better means more capable of making it farther into the future, I'm rooting against the making in the future. But when they do, it's better from their perspective more

**Heather** 53:37

successful at what it is trying to do, which is the opposite of what we want it to do. So when it gets better, we lose more. We want to get there. We want to stop it's better strains. It's better lineages in their tracks,

**Bret** 53:50

yes. Except that it is possible that it I don't think we're anywhere near this, but it's possible it could go benign and do things that are better for it and less costly to us. In which case, we might root for that, but But in any case, you've got a virus trying to lodge itself into the future. And mutation is the recipe for discovery or it is the first ingredient in the recipe for discovery of new mechanisms. And I must say that this all echoes back to the question of where this thing came from, and why a rational person would conclude one thing or another. One of the salient facts about this virus is that several versions of it showed up in several early patients in Wu Han, who all apparently had the same sequence, suggesting that this was not the result of experimentation on the part of the virus, but that it was good to go with respect to moving from one person to the next. So the question of new strains is tied up in the question of how likely is this virus to acquire a mutation that makes it less simple for us to control? Right? And so the new strain thing is very dangerous. And I should also say that this is tied up in a question that you and I began to grapple with this week, which is, social distancing, is actually a fractal problem. Yes, that there is a hazard when two people meet in close enough proximity to transmit this virus. And then there's an even greater hazard, the farther you travel, because a person who travels over 100 miles, 1000 miles, whatever it might be, is in danger of taking a strain that was resident in one part of the country or the world and transmitting it to a new part of the world. And, you know, you could have a strain that is not well adapted to cold climates. And you could end up transmitting it to a warm climate from a cold climate where it would have had a hard time and you transmitted to someplace where we'll have an easy time. And so the chances of us stamping out Sardis Cove two are even lower, because we've now given it a foothold somewhere that it's better adapted. So these questions really have to be thought about and I guess maybe the overarching plea would be somehow, we need to get a group of people who is smart enough, who is educated with the right sort of background so that they can understand these and completely free of corrupting influences and perverse incentives so that we can have a broad ranging discussion of the right response to make the likelihood of this thing remaining pathological and permanent, in the human population as low as possible. And I don't think that discussion is taking place everywhere, because anywhere because the degree to which those who are in a position to understand what's going on are also in a compromised position with respect to what they can say. And what is in their interest to say, is extreme.

**Heather** 57:19

So let's, let's segue from that excellent population level analysis to just a little bit of individual level analysis, which is to say what, you know what, what can you do individually of just to to keep yourself safe to make yourself less likely of attracting this thing, which is a place that we started our or ended our very first live stream with. And I want to just show, show a chart not yet. sec. show a chart that was produced by an MD PhD, he was someone who's both a medical doctor and PhD, I think it's microbiology, which just in which he puts numbers that he's made up to the likelihood of contracting covid 1900, under a number of circumstances. So it's a little bit like the flowchart. You know, it's he's trying to estimate different things. But he's, he's done an exercise a little bit like the one that you suggested with regard to hypotheses, right. And so I think this is something that people who aren't trained in science don't necessarily think of scientists doing. But I think that actually, all the best scientists and scientists science minded people actually do is try to imagine what their certainty of certain things is, and also put numbers to how likely a hypothesis or mode of transmission or something is so that they can make decisions as opposed to just receiving don't wear masks from the US Surgeon General the end of February, and taking that as the God's honest truth. So you can put this up now, Zach, here's this MD PhD is estimates of what your risk is doing different things, where the higher the relative score, the greater the risk, where he is doing a procedure and an ICU patient in which they're intubated, and their suction their CPR, it's really, really high risk to you, the people in that room because the patient, if they're infected, is going to be just spewing viral particles with all of these all of these ways. Similarly, working in a shift and er ICU full of COVID patients is very risky, dropped down to the bottom of the breathing exposures. Walking in a big city, trying to stay six feet away. And he doesn't talk about masks here, but he has separately that's pretty low risk, actually, right, living in your house for a day. For adults just doing the basics. You haven't had any guests really low risk. Walking in a suburban yard or street with no people in sight. He has that zero. And again, these are numbers that he's made up but these are these are informed guesses and this feels like the kind of unknown says that we are not seeing nearly enough, right. And furthermore, he does, he does a similar thing with fewer lines for touch exposures. And this is basically based on. So you know, opening a door frequently that's been used by other people, yeah, your risk is a lot higher than if you open a door that's been that's been touched by a couple of people, or even if you hug or shake hands with a couple of people, that's riskier than touching a door handle that's been touched by a lot of people. But door handles are less risky than hugging. But the more people who have touched that door handle or that pin pad, the the higher your risk is. So there's a we heard early in this crisis, a lot about the risk of exponential growth of infections. And the flip side of that is exponential decay of viral particles. And I know that we've talked about this a few times on past live streams. But exponential decay of viral particles means In short, that even if someone who was actively shutting viral particles, who is currently second is actively shedding viral particles, delivered a package to your door. And we know that viral particles can live in theory on cardboard for up to 48 hours, the chance that any of those actually shut off the cardboard is low, but it's much more likely that you will end up with a viral particle that is active that transfers to your skin, within five minutes of that cardboard being touched by a person who's actively sick, then an hour or two hours or six hours or 24 hours. Such that yes, it is theoretically possible that a viral particle could be detected 48 hours later, but the chances of you getting sick from that are far far, far lower than 24 hours later, and they are far far, far lower than six hours, then 12 hours later, six hours later, basically, the farther out you go, you have this exponential decay over time, just like we were predicting. And we seem to have seen a lot of cases exponential growth of sickness over time.

**Bret** 1:02:05

So this is this is perfect. This connects what we started these live streams discussing primarily, which was how does a an informed person facing all of the uncertainties of this disease, navigate in the world and minimize their risk so that it is tolerably low. And what we find is that many of our intuitions were actually right. Masks help. Turns out they may help more if you're sick from transmitting it to other people, which raises a question of game theory. But nonetheless, it appears that when both parties are wearing them, it's the best situation. And being outside appears to be safe, if not protective, there's an opportunity cost to being indoors, things being delivered to you create some risk, but it's manageable by virtue of how you deal with the packaging. If you take the thing out of the outer package, so that you're dealing with something that probably hasn't been touched by a human in 48 hours, you're probably pretty close to zero, if you then wash your hands so that anything you touched, couldn't get into you. The fact that dosage appears to be related to low dosages on a package that comes to you are probably pretty safe to begin with. So anyway, I think this is good. And what I'm hoping actually that people get out of this is that there is a way of navigating these questions without certainty, that does have a positive effect on your behavior and its likelihood of protecting you. Right. And maybe the place where we timer over an hour, we're over an hour. Maybe the place to, to close this out is to mention these numbers, I remember two of them vividly. And again, I'm not saying these numbers are accurate, but I'm saying that their source is high quality, and they stopped me in my tracks when I read them. The first one was

**Heather** 1:04:07

this is a Johns Hopkins researcher, I believe has written a short letter objecting to some of the characterizations of how bad the pandemic is, is that right? Right. And remember, he

**Bret** 1:04:19

said, I think this plays into the question of, you know, is it time to go back to normal, etc. And the two statistics I recall, were that COVID-19 is now the leading cause of death in the United States. I find that very surprising.

**Heather** 1:04:37

And you know, the naysayers will say that lots of things are being attributed to COVID-19. That, that shouldn't be, but but at the very least COVID-19 is killing a huge number of people. If the metrics that are being used suggest that is killing more people than any other cause of death. It is killing regardless of whether or not that number is flawed. We're just

**Bret** 1:04:58

killing them with lockdown. Yes. So the concern is not only do we have an evolutionary hazard if we would lift the lockdown, where the virus gets more room to discover new ways of infecting people and jumping from one place to another, but we have just the simple virus as it exists, doing more of what it does and killing more people. The other statistic Was that something like one in 500 New Yorkers, and I think this is New York City that we're talking about, but one 500 New Yorkers has died from this. Yeah. Which is

**Heather** 1:05:33

point 2%. And that's not a point 2% case fatality rate. That is a point 2% mortality rate in the population. So if 100% of New Yorkers have been exposed, which no one thinks they have, then that means Okay, point 2% of people who have this thing die that seems kind of low, and it's still not okay, but there's no way no one thinks that 100% of New Yorkers have had this thing. No one even really thinks that 50% of New Yorkers have had it. So if 2% of New Yorkers have had it, and point 2% of New Yorkers have died from it, that's 10% of people who have it are dying. And if more percentage higher percentage than that of New Yorkers have had it, which is probably true, then that fatality rate goes down, but one in 500 New Yorkers are dead in the last few months from this, and again, with the caveat around your Fromme versus with this disease and all that, but that is a staggering number.

**Bret** 1:06:32

It's a staggering number. And if we if we misunderstood the Johns Hopkins report, let us know what we've misunderstood. But it seemed fairly straightforward. I guess the the conclusion of all of this, I think, is, let's be Let's be decent about it. There is something unprecedented and frightening about the lockdown and its consequences, the idea that we cannot gather in large numbers is frankly, it is presumably unconstitutional. On the other hand, what we are facing is so serious, that we are having to navigate with new tools against an enemy that doesn't know about or care about the Constitution. So

**Heather** 1:07:21

I'm actually gonna push back on that, like we, we need to go Yeah, but I don't think it is unconstitutional. And there's a good analysis out there by someone who's actually on the right, who is a legal scholar that I don't have today, because I didn't know you were going to go there that says no, actually, in times of mass risk, which is specifically public health, the Constitution, the government is allowed to expand its powers so long as it restricts restrict its powers. Again, once the threat is passed.

**Bret** 1:07:52

Well, let me say this. I believe that's probably true. And we do this all the time. But then the Constitution, and I believe this is right has to be treated as a living document, the right to bear arms doesn't imply the right to have nuclear weapons. So obviously, discretion is the key to making the document work. And in this case, I think the point would be that discretion used properly means that this is to the extent that this appears to challenge a constitutional provision is warranted, which does not make all such things warranted. We've seen lots of stuff in light of terrorism where government overreach has been extreme, and without cause, but Alright, so let's,

**Heather** 1:08:35

we're gonna take a break for 15 minutes, we're going to come back with q&a from Super Chat questions. If did they come in Zack? Yes, okay. Excellent. And we're gonna start though, we're gonna start the q&a in about 15 minutes from the length that you'll find in the description of this livestream, by addressing echoes question from last time, which was about whether or not male genitalia size and female brain size are linked evolutionarily and why that might be the case. So that's the teaser. That's where we'll start next time in about 15 minutes.

**Bret** 1:09:08

All right. We will see you then.