Sawbones 370: COVID Variants and Guns for Vaccines

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[theme music plays]

Justin: Hello everybody, and welcome to *Sawbones*: a marital tour of misguided medicine. I'm your cohost, Justin McElroy.

Sydnee: And I'm Sydnee McElroy.

Justin: The voice is sounding good today, Syd. I don't know—did you sense it?

Sydnee: Mm-hmm.

Justin: You sensed it, right?

Sydnee: It's kinda deep today.

Justin: The instrument—

Sydnee: It's gravely, deep.

Justin: —it's tuned and ready to—ready to go. You know, I think it's just excitement, 'cause we're finally gonna do it! We're finally gonna talk about coronavirus. [laughs quietly]

Sydnee: Oh yeah. Well—now, don't say that, because as soon as you say that there's a section of our audience who's gonna go, "No!" But—[laughs]

Justin: No, it's good! It's very—it's—it's—it's a good time—I just got my, uh—my weekly after-vaccination check in reminder, literally as we were just talking.

Sydnee: Well, there were a couple things that, uh, we got a lot of emails requesting, you know, some questions answered, a little bit of clarification on. Um, and i thought it would be worth—I mean, I don't wanna do an update.

Like, there's places you can go look at the numbers of cases and stuff, and for a lot of people you're living that. But specifically addressing two things. One, the variants. Um, because I think especially very recently there was an article that came out about the variants in vaccine efficacy, and I noticed there was a large gap between what the article and the data actually said about that and what the headlines [laughs quietly] said about that.

Justin: Yeah, I been—I been bothering you with some questions about that, so that's one of the things that prompted us to want to talk about this today.

Sydnee: Uh, that was definitely part of it. And then the other thing I've been receiving very recently a lot of tweets and messages and emails about is the question of vaccine incentives. And we'll get into the West Virginia specific ones, 'cause... 'cause they're spicy.

Justin: Oh boy! Babydog's on the prowl!

Sydnee: They're spicy. And part of those questions are, is West Virginia really doing this? I'll—spoilers, the answer is yes. And—[laughs]

Justin: For sure, for sure, for sure.

Sydnee: Uh, secondly, it's an interesting question, the idea of incentivizing vaccines in this way. Is there a history for that? Is there evidence for that? Is that something that would work? Um, so there is some history to this show, this episode. Because I do want to talk about, like, why would somebody think that was a good idea? It's not that wild.

Justin: Okay.

Sydnee: But let's start with the variants, because I think that's the thing that is on a lot of people's minds. Is my vaccine still working, if I got it? Hopefully you did.

Justin: [laughs] I did. You know I did—actually, personal update.

Sydnee: Well, I know you did.

Justin: That elicit non-street-legal AstraZeneca pumping through my veins. Government says it's too powerful!

Sydnee: Uh, straight from Oxford to us with no FDA infringement. [laughs]

Justin: I don't need the man gettin' in my way.

Sydnee: So we have incredibly effective vaccines against COVID-19.

Justin: Woo hoo!

Sydnee: That is the—

Justin: Appreciate it! [crosstalk]

Sydnee: —like, headline that should trump all other headlines that keep going out there. We have an incredibly—

Justin: Not the greatest—not the greatest word choice, but go on.

Sydnee: Well, you know what I mean. [laughs quietly] Oof. That should, um... usurp all other headlines. [laughs]

Justin: [snorts] Worse, somehow! Worse! [laughs] It's more obvious by the effort.

Sydnee: At the time of this recording—and you can follow this if you go to CDC.gov, you can watch their, like, coronavirus tracker, which not only keeps track of all the cases in your area and in the country and all that kind of stuff, but keeps track of all the variants, and what proportions are various places, keeps track of vaccination rates, down to the county level.

Um, all these things are being tracked, so you can go—this is all open information. You can go check it out. At the time of this recording, 41.6 percent of the US population is fully vaccinated. That's of the entire US population, so not just those eligible.

But I think that that's an important number to track, because while it is nice, like, morale-wise to see that if you just go to the people who are actually eligible, that number goes up, and if you go to specific high-risk groups like people over 65, that number goes up even higher. That's all good news.

When we talk about things like herd immunity, when we talk about the idea of enough of us being vaccinated to protect those who aren't, 41.6 percent is not there yet. Which, you know, I mean, we're getting there. It's not bad news, but it's a reminder that we've still got work to do. Right?

Justin: Yes.

Sydnee: Part of that work is approving the vaccine for, you know, everybody, but we're getting there.

Justin: We're getting there.

Sydnee: Um, and I think I should preface, I am gonna mainly focus on the situation in the United States. Um, that's where I have most of my data. Uh, and that's where I understand, as a medical professional working here, what the situation is on the ground.

Um, obviously we still have a huge global issue in terms of vaccine availability.

Justin: Absolutely.

Sydnee: The vaccine distribution has been incredibly inequitable, and we have some countries, like ours, which are super saturated with vaccines, and other countries where it is still rare to come by outside of those in specific, like, healthcare professions, high risk fields and things like that.

Justin: Yeah.

Sydnee: Um, so, you know, I think it's always important to remind our listeners of that, that we are so privileged to be having a conversation about incentivization for vaccines in this country, um, and not a conversation about how the heck do we get vaccines.

But what other issues are there? Well, first, the variants are causing concern, as we're trying to get everybody vaccinated, for a couple reasons.

One is that many of these seem to spread more easily, right? That's what we keep hearing about these new variants, and that headline, if you see it, is true.

These tend to be more contagious, they spread more easily than the original recipe, I guess.

Justin: [laughs]

Sydnee: If you... wild type.

Justin: These new extra crispy variants.

Sydnee: [laughs quietly] Technically wild type is what we would call...

Justin: Oh.

Sydnee: ... the first—the first virus. Um, the one that was originally isolated. Um, and so it's kind of a race, right? If these spread more quickly, but are not necessarily more deadly, we don't necessarily have that data to prove that they're more dangerous, just that you're more likely to give them to other people if you get them, so now the rush to get people vaccinated becomes more urgent.

But the other concern is that, will the vaccines that currently exist cover these new variants? Will they still be effective? And that's probably the scarier of the two, right?

Justin: Yeah.

Sydnee: One is just a matter of moving quickly. The other is, will moving quickly even work?

So the first variant that you may have heard of—and I don't remember hearing it called this a lot—the alpha variant?

Justin: The just—I read a story about this. They just decided to, like, start rebranding these to make them easier to, like—I think, probably, to avoid the old Spanish Flu thing of, like, naming them by a region. You know, they're—

Sydnee: I think you're exactly right, that's exactly why I'm gonna—I'm going to regionalize two of the variants we talk about, only to give you the new names so that you understand what I'm talking about, because I noticed that too. That some of the older names are being replaced with these alpha, beta, gamma, delta—these new names.

Justin: Yep.

Sydnee: Which I approve of that idea. They are gonna be, I think, harder to remember now. [laughs quietly] Because we learned 'em one way. But it's a good idea. I think we should be doing that.

Um, so the alpha variant has replaced the wild type virus in many places, if not most places. That has taken over. Um, so, like, if you think about what is spreading widely in the US for instance right now, we're talking about the alpha variant. We're not taking about the wild type virus that was first detected in Wuhan, what seems like—

Justin: [laughs quietly] Many, many years ago, yeah.

Sydnee: —a million years ago. [laughs] But it wasn't. Um, the good news is that the vaccines still appear very effective against that one. That's why you haven't, I think, heard as much about how it overtook everything, um, is because we kind of thought it was still working well against the alpha variant.

But, like, the bad news, like many of what are called VOCs, variants of concern—there are variants of concern and variants of interest. [laughs quietly] So, like—and there's qualifications for each of those. Those are, like—

Justin: Are there some maybe chill variants, where they're not very bad? And it's like, "Ooh, this is a good variant."

Sydnee: Variants of no concern? [laughs]

Justin: Yeah, variants of zero concern, very good! Chill, chill variants.

Sydnee: I'm sure, but they don't maybe track those quite as closely. Once they find them, they forget about them and pay more attention to the others.

Um, but again, you can look all this up on the CDC website, where they list what are US specific variants of interest, variants of concern, and what the criteria are for those different, you know, categories.

But, like many of them, the alpha is more contagious. Which is the theme. You're gonna hear that repeated again and again. They're more contagious. Um, the other variant that's causing concern globally, although not circulating widely in the US yet—which, I mean, you have to assume it's just a matter of time with all of these, you know? If one is out-competing the other strains, so to speak, in the sense that it's more contagious so you're seeing a rise in those cases while you see a fall in the alpha cases, it's just a matter of time before it gets everywhere.

Justin: Yeah. Don't trick yourself into the thing we all did in January of 2020 where we were like, "I don't think it's actually gonna be—"

Sydnee: "I don't think it'll get here."

Justin: "—I don't think it'll be a problem here."

Sydnee: Uh, the delta variant. This variant, originally isolated in India, is now taking over the alpha variant in many places, like the UK just recently—I think they have—it has come into the lead. It is more prevalent than the alpha variant. New cases. Um, so the incidence, I should say, is higher.

Because it is even more contagious than the alpha, than the original, than—you know, like we've said. Um, most new outbreaks are associated with this delta variant. And while the jury is still out at this point, honestly, as to whether this one might be slightly more dangerous. So, not just more contagious but can it—is it more likely to make you sick? Is it deadlier?

Um, we don't think so, but we don't know for sure, right? Because that piece is gonna follow. Like, you're gonna see—if you're monitoring the genomic situation, like, you're monitoring new strains and testing periodically to see what—or not strain, but variant—what variant is out there. If you're monitoring and monitoring and monitoring and you start to see a higher proportion of these delta variants, you wouldn't see the increased rates of hospitalization and then increased fatality until later.

Justin: Mm-hmm.

Sydnee: So we don't think it's necessarily more deadly, but that's kind of still a question mark. Um, is it theoretically more dangerous?

Um, we fear reinfection with it. That's been one thought. Are we seeing new cases because people who had alpha and recovered are now getting delta, or people who had wild type and recovered are now getting delta? The data has not supported that as of yet, that that's not really the case.

Um, and we know that it has at least four specific mutations that make it spread more easily.

That's the level—if that—science brings me comfort. [laughs quietly] If that level of detail might bring you comfort, we are understanding how this thing is changing down to, like—like I said, there are four tiny mutations—

Justin: Of this mutation?

Sydnee: —in its genetic code where we know exactly why it is what it is.

Justin: There are muta—oh, you're saying that there's four little things that are different about—okay.

Sydnee: Mm-hmm, four little differences that make it more contagious. Um, and we understand each one of them, and why that is happening. Scientists are following all of this so closely.

And again, this data is all widely available, too. You can look at all this online. I think it is a little denser. It's a little harder to parse. I mean, even for me. Like, as a medical professional, I understand it conceptually, but I'm not, you know—viral genetics are not my specialty. [laughs quietly]

Justin: Yeah.

Sydnee: Um, but still, you can look it all up. The big question with this—

Justin: You should've asked me for help, babe, if you were struggling with it.

Sydnee: Oh, uh-huh?

Justin: [holding back laughter] I absolutely would've just waded in there and, um... I'm a white guy, so I probably—

Sydnee: Sure.

Justin: —I feel like I could've—

Sydnee: Explained it to me?

Justin: A little bit, yeah! I mean, I don't wanna...

Sydnee: Yeah, as a man!

Justin: You've done so much for me over the years in science communication. I feel like if you were—if you were—if you've been like, "Ah, shucks! This one's just too tough!"

I would've been like, "[deep voice] What's goin' on, baby? I can help."

That kind of thing?

Sydnee: Yeah, yeah. I can—yeah, I can hear you saying that.

Justin: "[deep voice] No need to get frustrated. Let's do this together!" You know, that kind of thing.

Sydnee: Mm-hmm, yeah. It's like when you're woodworking and I come in and say, "Well, I don't know anything about tools or woodworking, but maybe I could figure it out for you."

Justin: Yeah. And I'm always very gracious. [laughs]

Sydnee: Mm-hmm.

Justin: In accepting that help.

Sydnee: Oh, wait. I've never done that. That's so weird. I wonder what the difference is?

Justin: Well, the difference is I didn't do it either, it was just a joke for the podcast.

Sydnee: [laughs]

Justin: Now, move on.

Sydnee: Uh, the big question with this delta variant, um, and with all the other variants we've heard about, there's the beta variant, which initially they were calling the South African variant and now—

Justin: That was earlier, right?

Sydnee: Mm-hmm.

Justin: That one I feel like you were hearing a lot about a little bit ago.

Sydnee: So now we're calling it the beta variant.

Justin: Okay.

Sydnee: Um, and the gamma, which is—[sighs] I don't feel like it was called the Brazilian variant, but maybe they talked about one out of Brazil? Anyway.

Justin: I don't remember that.

Sydnee: The gamma. So the beta and the gamma and the delta are the ones that we're all kind of more worried about than the alpha at this point. They are all more transmissible, again. Um, the question is, are the vaccines as effective against them, so there was a recent study that was published in *The Lancet*, and it specifically looked at the Pfizer vaccine. So, that's the only one we have a good amount of data for. There's some scattered data for some of these things from the, um, Oxford or AstraZeneca vaccine, and the Johnson and Johnson—or Janssen vaccine.

There's nothing so far that I've seen published yet from the Moderna. And this is the thing that got all the media coverage, this study that came out in *The Lancet* just this past week, and then you saw all the headlines. This is where it came from. So, they looked at the Pfizer vaccine against the delta, alpha, and beta variants.

Justin: Okay.

Sydnee: Okay? And what it found, like I said, has been widely, widely reported, but not necessarily well reported. Um, first of all I would say, again, your—the takeaway point is that the vaccine still seemed to be very effective against all variants of concern so far. That's the main takeaway, I would say.

It did show a couple of things, though, that we do need to know and monitor and be concerned about, and I think it's important to be very clear about that. It wasn't all rosy, like, "Yep, works just as well against all the variants."

No, it didn't show that. But the idea that it showed this catastrophic deficit in the vaccines, which I think is what was sort of hinted at in some of the headlines, is not true.

Justin: Yeah, I—we—I actually was looking at this right before, 'cause, like, I had seen some of these headlines pop up. And, like, I feel like the media needs to get their act together, the way that they're reporting. Like, take a beat and say, like, "Do I actually know what I'm—" 'cause they are—there's some fearmongering going on that they need to be—

Sydnee: Mm-hmm.

Justin: You saw it a lot, I think, when there would be incidents of side effects for the vaccines. Like, the Yahoo news story about this exact topic is, "The delta variant of COVID-19 just got even scarier."

Like, can we do better, please? Can we, like, be adults about it, thank you? Okay. Anyway.

Sydnee: Well, I think you're exactly right. Because it's not—I mean, it's not scary. It's overall good news. Um, but if you don't acknowledge the places where you can do better, then, well, why are you even... I don't know, in science? [laughs]

Justin: Yeah.

Sydnee: If you're not seeing problems and trying to perfect the thing you're working on to work even better and address things, which obviously scientists

are—I mean, that's why they do these things, so they can look and go, "Hm. How can we address this moving forward? Is there something we're missing?"

Um, not so that we can be scared, 'cause being scared doesn't seem to help us very much.

Justin: Hasn't yet.

Sydnee: No. Uh, so it—like I said, it shows a couple of things we needed to know. First of all, one Pfizer shot was found to be pretty good against the original wild type strain, right? Like, we learned that as things went on. Like, I know it's a two shot regimen, but you get pretty decent protection even after the first one, so that's good news.

Um, because while you're in the midst of your vaccine series, you already are quite—not fully, but quite protected, so that was something we all really liked.

This is not—and it's only slightly less robust against the alpha variant. However, the reduction of efficacy of one shot of the Pfizer against the delta and beta was much more significant.

Justin: Okay.

Sydnee: So the idea that we could get away with just one shot, maybe, of the Pfizer, seems to have dissipated with this. Like, "Well... maybe against the old variants."

But against these new ones, that second one is gonna become really important, because after two shots, that gap was bridged considerably. It wasn't found to be as effective against the delta and beta as it was against the original wild type virus, um, but the difference was pretty marginal, and it was still an incredibly effective vaccine. If the numbers that came out, which are in the 80 percentile, in the 86 percentile range effectiveness against these new strains, if that was the original number that came out with the vaccine, we would've all celebrated, right?

Justin: Mm-hmm.

Sydnee: I mean, 'cause some of the vaccines that are in use are in the 70 percent range.

Justin: Yeah, like [crosstalk]—

Sydnee: So why is a reduction to the mid-80's, why is that bad?

Justin: Why are we focusing on it at all when—I mean, here's the thing. This is my opinion after hearing you talk. We shouldn't be sparing a thought for these variants currently when, like, vaccine, one, hesitancy, and two, supply line issues and production, those are what we should be focused on. Like, it—the—not these—not the variants, right?

Like, if you're gonna be worried about something, is what I'm saying. Not, like, the government shouldn't be. But, like, if you personally as a human being want to be worried about something, be worried about, like... those things.

Sydnee: Yes. Yes. No, I think—okay. Yes, I'm gonna get there. I have the takeaway points. What I do think is important that we could all as just, you know, people, not necessarily the scientists involved in making this stuff but just people living through this, I think there are some takeaway points from this that are helpful, but I agree with you generally that this is not where our focus should be right now as, like, people trying to make it through it.

Um, I want to talk just briefly about how this study was done to understand what we can learn from it, but before I do that, we gotta go to the billing department.

Justin: Ah. Well, let's go!

[ad break]

Justin: The back of my seat is all cold because I've only needed the edge of my seat—

Sydnee: [laughs]

Justin: —waiting to hear about how this vaccine study was conducted for *The Lancet*.

Sydnee: They're doing this big—I'm gonna be—I'm gonna be brief. I'm not gonna get in—I read all the details so that I could summarize it for you, and you wouldn't have to read all the boring stuff.

Justin: Uh, thank you. [laughs]

Sydnee: They're doing a big study in the UK called the Legacy Study, and they're taking basically, like, antibody levels—they're taking serum from people who got the vaccine, healthcare workers largely, and periodically testing them. And there's this big, giant study to collect lots of data so that we hopefully in the future can understand better, um, why do some people get so sick? What are the risk factors to getting so sick from COVID-19? And then, um, what treatments might work better in the future?

So there's this big, giant study. And as part of, um, the serum that they've collected, you know, from all these individuals in this study, they were able to do this, this other research.

So, basically what they did is they took serum from somebody who's vaccinated. So, like, let's say you're a healthcare worker and you got one vaccine. Then they would take some of your, you know, vaccinated serum, and they would add it to some infected cells in a petri dish.

Justin: Okay.

Sydnee: And there would be a petri dish with some wild type infected cells, some with the alpha variant, some with the delta variant. Um, and basically look to see how effective it was at stopping, you know, replication and entry into the cells, and infection, as a model of stopping infection.

Justin: Okay.

Sydnee: Right?

Justin: Right.

Sydnee: And then they would dilute that and put it in again, and dilute it and put it again, and from each of those dilutions they could calculate how many neutralizing antibodies were in there. Okay?

This is how they come up with these concepts of how effective it is. This is, like, the stuff that's actually being done when they then publish that percentage. Does that make sense?

Justin: Yeah, because you can't just—I mean, it's hard to do that, like, in the human body, I would imagine. Like, to run those tests on actual people.

Sydnee: Yes. Well, yeah. I mean, you—[laughs] that would be, um—it would be very difficult to say, "Hey, we have this new, highly contagious strain that may or may not be more deadly, and what we would like to do is give you one vaccine, and then give it to you and see what happens." [laughs]

Justin: "Did we mention the Starbucks gift cards? Because that is part of the equation. I don't know—okay! You're walking away. Alright."

Sydnee: Basically what they found is that it was harder to—that you didn't have as many neutralizing antibodies to the delta and beta variants as you did to the alpha and wild type. There was, like, a slight reduction to the alpha, and then a more—and then a statistically significant reduction for the delta and beta. After one dose, the number was much lower. After two, there was a 17 percent reduction, is the number they came up with.

Justin: Okay.

Sydnee: Um—

Justin: What does that mean? Con—contextualize that for me.

Sydnee: That the vaccine is 17 percent less effective against the delta variant than it is against the—

Justin: Right, but what is the practical—practically speaking, what's it mean?

Sydnee: Like, will you still get sick? I don't know.

Justin: I don't know.

Sydnee: Theoretically, there are going to be more breakthrough infections with the delta variant—

Justin: [simultaneously] That—when I—when I see s—

Sydnee: —but I don't know—I mean—

Justin: —when I see 17 percent, what I—the question for me as a layman is, does that mean there's an 83 percent chance I won't get it, and there's a 17 percent chance I'll get it just as bad as everybody else, or there's an 83 percent chance that I will... like, are we talking about a reduction in power, or reduction in, like, binary, yes/no, you are defended or not defended against COVID?

Sydnee: Um, we're not sure yet.

Justin: Okay.

Sydnee: We don't know if that's a reduction in, like, asymptomatic infections, symptomatic infections... hospitalizations, serious infections, deaths. What we know is that you don't have as many neutralizing antibodies to these new variants as you do to the original.

Justin: 17 percent less, you might say.

Sydnee: Yes, yes.

Justin: Got it. Okay.

Sydnee: That's what it means. [laughs quietly]

Justin: Alright.

Sydnee: So theoretically, I mean, what—and you can look. There are charts where people have taken this data and sort of extrapolated it to what that means. And again, that's where you—that's where you get that, like, I think 86 percent—based on this data, we would extrapolate that it is 86 percent effective in preventing serious disease, hospitalization, death, blah, blah, blah.

And, like, I think—I believe the chart said 82 percent effective in preventing all infection.

Justin: Okay.

Sydnee: Which are still great numbers, but obviously less than the original, what, 94 percent, I think, for the Pfizer?

So... and there's problems with comparing all these numbers, and we're extrapolating things based on models. And so, like, there's a lot—there's a lot of variant in there. It's not so easy as saying, "So, these numbers are hard... math—" like, it's not hard math. You know what I mean?

Justin: I gotcha, yeah.

Sydnee: Like, we're still trying to piece some things together. Um, so what does all this mean?

First of all, they found that an older age made you more at risk for having a low number of circulating neutralizing antibodies, right? Which are what the vaccine are supposed to make you have. We know that's true anyway. We know that's true for vaccines. Generally speaking, the older you are, your body is not as good at generating that immune response. We know that.

Second, as time since vaccine increases, your number of neutralizing antibodies decrease. We knew this already. We already were seeing this. That, like, in these studies that many of us are in, as they take our blood and measure our numbers of neutralizing antibodies as time goes on, the further we get from that second dose, the lower those numbers get.

We don't know exactly what that always means for immunity, because as we've talked about before, there are others—there's that memory, that humoral, that memory immunity that your body has where even if you don't find the antibodies, your body still remember, and T-cell mediated immunity—all these things that are sort of... immeasurable in this study.

They're measurable, but not—we're just not—not like that. Okay?

Justin: Right.

Sydnee: So we don't know what that means, but we do know that those numbers go down.

Third, the vaccine still works extremely well against these new variants, the Pfizer at least.

And fourth, we still don't know what any of this, as I've already kind of alluded to, we don't know what this means in terms of actual disease. They're doing all this in cells in a petri dish, 'cause it's what they have to do.

Justin: [laughs] Sure.

Sydnee: But we don't know what the delta variant is gonna look like when it plays out, like, in real life. If a vaccinated person gets exposed to the delta variant, does this just mean that it provides them less protection from infection and all, and they're more likely to carry it asymptomatically? Or does it mean they're more likely to get a severe case of COVID?

Um, we can extrapolate numbers that we think are true, but we don't know for sure yet. This is still something that we need to know.

What it did indicate, though, is that since the UK, like most places—this is where a lot of this was focused initially. Since they vaccinated older people first, which we did too, that means it was a while ago. They've had their vaccines, some of them, the longest.

Justin: Yeah.

Sydnee: Um, also front line workers and all that, but, I mean, if you're over 65, you got your vaccine quite a while ago. If you're over 80, maybe even longer. And because they are older, they generate less of an immune response, possibly. So maybe they're getting to be at higher risk.

Justin: Okay.

Sydnee: That is one concern that was generated by this. The further out we get from them being vaccinated, we start to worry.

Um, it also called into question the—if you remember, in the UK they initiated a policy of, "Let's get everybody one shot, and we'll increase—"

Justin: Yeah, right.

Sydnee: Remember?

Justin: Yeah, yeah, yeah.

Sydnee: They increased the interval between the first and second dose in order just to get everybody vaccinated as quickly as possible.

Justin: Yeah.

Sydnee: And if one shot provides you a really good level of immunity, that strategy makes a ton of sense.

Justin: But...

Sydnee: If one shot doesn't, that strategy starts to make less and less sense. This is—I think this is part of why this got so much, um... sort of, like, alarming traction. Is that that specific idea that maybe we could just get everybody one shot as fast as possible, and then get the second one whenever our supply catches up, that idea kind of crumbles in the face of this delta variant.

Justin: Sure, yeah.

Sydnee: Um, there's a lot of math to figure out exactly, you know—well, how long can we wait, and how much effectiveness does it still have? And all this.

But I think that is part of why this got so much more press. Um, the AstraZeneca and the Johnson have also indicated less efficacy against these other variants. Um, but we're not really sure what that means yet for the delta. They haven't done this. This that *The Lancet* published was the really—the first really good chunk of data we have about the delta.

Justin: And just on the Pfizer.

Sydnee: Yes. And it's just on the Pfizer. The Moderna we don't know. A lot of people have said, like, we should probably extrapolate whatever Pfizer has to Moderna, 'cause they're very similar, they're both mRNA vaccines. But we can't say that for sure. We just don't know.

So what do you do with this information? Uh, I would say one, if you're not vaccinated, [holding back laughter] I would start that process as soon as possible.

Justin: Yeah, might as well go get one.

Sydnee: Um—

Justin: If you can.

Sydnee: —and two, if for some reason you were considering not getting your second shot and you've already had the first one, I would reconsider and get the second shot, because while the old variants—maybe you were okay with that one shot, the new variants, it is less likely that the one shot's gonna get you there. It still could, it's just less likely.

Justin: Yeah.

Sydnee: Um, so I think that that's, like—there's not a lot of other takeaway that the average person can do with this information. The vaccine still works super well. Nothing changed. It just stresses more that we need everybody to get vaccinated, and everybody to get fully vaccinated.

Um, pay attention. There may be a booster at some point. That's the other thing that a lot of people were talking about is, "Well, from this data, are we thinking, like, we're gonna need to not just get a booster of the same thing, but a booster that has been, you know, tinkered with just a little."

Justin: Yeah, yeah, yeah.

Sydnee: Like, you know, especially with these mRNA—

Justin: To—to broaden your coverage a little bit.

Sydnee: Yes. Or maybe our booster—you know, there are a lot of—like the flu vaccine, for instance. The flu vaccine doesn't just have one flu strain in it, right? We know this. It usually is made up of four different strains, three As and a B.

Justin: Right.

Sydnee: Well, maybe the future COVID vaccines will have more than one in them. You know, maybe they'll have this wild type, alpha, all this stuff that it covers really well. And we'll throw in something that's a little bit changed to better cover these delta and gamma and beta variants.

Justin: Okay, sure.

Sydnee: That's all that—that's why this information is important. It doesn't mean that you at home should be scared of anything. It means that the scientists who make the vaccines [laughs quietly] are figuring this stuff out. It's information for them, but then it gets published in the lay media, and all these other... words like "scarier." That just shouldn't even apply.

Justin: Yeah. It's—it's—it's pretty irresponsible.

Sydnee: So... if you're still not convinced with all this...

Justin: I am.

Sydnee: [laughs quietly] But let's say somebody isn't. I've just told you why—

Justin: [simultaneously] I—but I am.

Sydnee: —all this information means is more than ever, get the vaccines that are available, because they are still incredibly effective, and safe, and you should get them. Everyone who is eligible should get them.

Um, if you're still not convinced, how about a truck?

Justin: Yeah. What?

Sydnee: Or maybe a lottery ticket? Do you wanna get entered into a million dollar lottery?

Justin: Yeah?!

Sydnee: Or would you like a hundred dollar gift card?

Justin: Heck yeah I would!

Sydnee: Or a savings bond? Which would you prefer if you're a young person. A hundred dollar gift card or a savings bond? [laughs quietly]

Justin: I'm just gonna keep—I'm just gonna keep gettin' vaccines until I hit it big, I guess.

Sydnee: You want a free ride to college?

Justin: Oh, yeah!

Sydnee: Or a free beer. Depends on which state you're in which one you're getting offered.

Justin: [laughs]

Sydnee: Or, or, or! How about a gun?

Justin: Oh...

Sydnee: Hm.

Justin: That's... that'll be the one I win. You watch.

Sydnee: [laughs]

Justin: I'm just gonna open a box that says "Fragi-lay" on the outside. That'll be my gun from West Virginia.

Sydnee: [sighs]

Justin: "Thanks for your participation in vaccination. Here's a gun."

Sydnee: These are all, in fact, incentives being used to encourage people to get the vaccines. These are all true, depending on where you are in the country.

Um... and while our state, West Virginia, has become the butt of a whole slew of new jokes—

Justin: Just what we needed.

Sydnee: —that I don't appreciate [laughs quietly] because of this, uh, I will tell you that—let me separate this out. First of all, I'm just gonna say—I'm gonna qualify this with, I do not believe we should be giving guns away for vaccines.

Justin: Yeah, or period, really.

Sydnee: No. We have, um, a gun violence problem, you might say, in the United States of America?

Justin: That's one of putting it, yeah.

Sydnee: [laughs] We have—

Justin: Just from all the gun violence we have.

Sydnee: Right, with all the gun violence, and mass shootings—

Justin: [simultaneously] Other than that, it's not even that much.

Sydnee: —and shooting deaths, and—

Justin: But other than those...

Sydnee: Yeah. But—so, like, I don't support that incentive, so let me just put that out there.

Justin: Yeah.

Sydnee: Now, that being said, the idea of vaccine incentives is evidence-based. We do have studies and data that say this isn't—this isn't, like, a wild idea.

Um, we've largely studied this in the past in families, like, looking at childhood vaccination rates. So, like, how can you incentivize families to get their kids vaccinated? We've also done some studies in people experiencing homelessness. How can you encourage people experiencing homelessness to come get different vaccines, as they've been offered through the years? I think one was on, like, hepatitis B.

We've been doing this since 1980, and so we have, like, big meta-analyses, which are we take a bunch of studies, and then analyze all the data from those all together.

Um, and we have those from different countries, too. The US has done it, Australia's done it, Germany's done it, different places all over the world have done this for a long time to try to get people vaccinated. And they have done

things like money, gift cards, food vouchers—a lot of stuff aimed at families. So, like, "Here's a gift card for various baby products that you might need."

Um, lottery tickets, government vouchers for childcare assistance. All these things have been used to increase vaccine uptake. And we know that even modest incentives do work. Like, it's true. If you have a fixed incentive, "If you get the vaccine, then you will get this," we have plenty of data that shows that there is definitely a subset of the population that is vaccine hesitant, but not vaccine—you know, not anti-vaccine.

And those vaccine hesitant people, for some of 'em it's just a matter of... [sighs] they're a little anxious about it, and they're busy, and it's one more thing to have to do, and they just... they haven't gotten around to it. And there's probably a part of, like, fear there too.

And that if you can just give them sort of the right motivational thing, they'll overcome that hesitancy and go do it.

Now, I am not gonna suggest that this is the only way to do that. Um, but this definitely works for some people.

They've also found, you know, if you care about such things, that it's cost effective to provide money to people to go get vaccines, because of all the money you save taking care of very sick people from the diseases that the vaccines prevent.

They have also found that a benefit is that it provides this increased contact between healthcare workers and patients, who are like, "Hey, come get your kid vaccinated!"

And then when you bring 'em in there they ask you about other things, and you build your relationship, and you take better care of people, and—so, like, there are other reasons why this is good. Um, that being said, because if you're gonna talk about something like this, you need to talk about the concerns and the possible harms, obviously the appearance of coercion isn't great.

Justin: Right.

Sydnee: And I think what we're seeing play out is that that—that one—and it's a very small percentage of the population, I think one study estimated it, like, 14

percent, who have said, like, "Absolutely no, no way, no pro—COVID-19 isn't a problem for me, and so I would never even consider the vaccine."

That percentage of the population sees this as more evidence as to why they shouldn't get the vaccine.

Justin: Right, yeah. Well... yeah.

Sydnee: "Why would the government give me money? What are you trying to do to me? What's the conspiracy?"

Justin: God. This—this—these past few months have been a absolute test of my...

Sydnee: But we weren't gonna reach those people anyway.

Justin: I know. I know, but they're still human beings. It's, like, so...

Sydnee: I know.

Justin: As a humanist it's, like, a very—a very challenging time.

Sydnee: I try to look at this from a public health standpoint, and if somebody is never gonna get vaccinated no matter what I say, but there are ten other people who, if I can talk to them about the right concern, answer the right question, help them traverse the right barrier, they will get vaccinated, the better use of my time as a science communicator is those ten people. Because that one person who believes that Bill Gates and microchips and 5G and government conspiracies—

Justin: Do you know how—

Sydnee: —I'm never gonna convince them.

Justin: —do you know how expensive microchips are right now?

Sydnee: [laughs quietly]

Justin: Do you know how bad of a microchip shortage—there are trucks sitting in Ford plants that they can't put out the door 'cause they don't have enough

microchips. But no, they're just, like, giving—they're just putting 'em in your arm. It's so stupid.

Sydnee: When you say that, you know that there's gonna be somebody out there saying, "But why do you think there's a shortage of microchips right now?"

Justin: [exasperated] Because the raw materials are—!

Sydnee: Because they're in the vaccines. [laughs quietly]

Justin: [sighs] I can't.

Sydnee: They're obviously not in the vaccines. I was being facetious.

Justin: No. I know. I know.

Sydnee: There's no microchips in the vaccines. Just... you know. Vaccine. Anyway, um—[laughs] you have to be especially careful, though, not just because of this sort of, like, fringe conspiracy stuff, but also we're dealing with vulnerable populations in a lot of these studies where they've done this.

Like, children or people experiencing homelessness, who you could use financial incentives as a form of coercion, and you don't want that to be... you know, you're motivating people, you're helping people make good choices by giving them something that makes their life a little easier.

Which is why, like, for all these programs for childhood vaccination, they found things that were very focused on families, like a food voucher, was helpful. Um, because it does help to address—so, some people have been asked, like, "Why are you not getting the vaccine?"

And there are a lot of places in the US where there are communities of people who are still concerned about, like, cost. Because we haven't communicated effectively that the vaccine is free to everybody. And I know through my personal experience helping someone else get a vaccine, like, navigate that process, helping get them signed up for a vaccine appointment, that when you sign up at certain locations they tell you to bring your insurance card.

If you are uninsured, you might see that and think, "Oh, well, I can't get it. I don't have insurance, and I don't know how much it's gonna cost, so I'm not gonna go."

And it doesn't say on those forms, "Also, you get the vaccine for free whether you have insurance or not."

Justin: Right, we would just like to bill your insurance if we could to offset the costs.

Sydnee: Yes, to the government. But we have not communicated well, still, as a nation, the vaccine is free to everyone, period. And whether or not you have an insurance card to present, it doesn't matter, you still get the vaccine.

Justin: Right.

Sydnee: We haven't—we haven't communicated that well. And we could do that. There are other people who have heard about these accounts of people saying, like, "Well, I took the day off of work after I got my second shot because I had so many side effects, and I wanted to make sure I could recover."

There are a lot of people who can't afford to take a day off of work just to recover from vaccine side effects, and so they're really hesitant to get the vaccine, because they're trying to find a time in their schedule where they can be sick for a day. So I don't think we've communicated effectively that the majority of people won't need to do that. You know? Most people won't need to do that.

We also haven't said, like, "How about this? How about we'll give you your vaccine and we'll pay you to take a day off work if you need to recover from it?"

Like, that's a thing a country could do.

Justin: You're talking about a functional country, though. Sure.

Sydnee: [laughs]

Justin: [laughs] I mean, yeah, if you wanna live in a *functional* country!

Sydnee: Or, I mean, like, the bigger systemic issues. Which is, like, you should be able to take sick leave when you're sick.

Justin: Here she goes.

Sydnee: And you shouldn't have to lose your job or lose your pay, you know?

Justin: [laughs] Here she goes!

Sydnee: That's—a functional society would provide that.

Justin: Ol' Dr. "Wanna Live in a Functional Country."

Sydnee: But instead we have people go to work sick to their own detriment and the detriment of everyone around them, and then you get a pandemic.

Justin: We only have an adversarial relationship between the—you know, the medical establishment and patients anyway right now, and so it just seems like another brick in the wall. The trust there is very—is very low here in our country.

Sydnee: There's more we could do. We could be taking more vaccines out to the people. Um, centralizing them isn't always the most effective. There are a lot more things we could do than just give any incentives, but there is a demographic of people for whom this will work, and it's so, um—generally speaking, studies have found that to be a low risk, low harm intervention, and cost effective. So, if that is the case, even if it's only a chunk that we're getting of the unvaccinated, that's a chunk that wasn't getting vaccinated that will, now.

Um, it might be working. Ohio claimed that, you know, they announced a lottery. Their governor is doing a few different things, and one of 'em was a lottery. And in the days after he announced that lottery, they stated, the Department of Health in Ohio said that they had a 28 percent jump in vaccines given in the days following that announcement, um, when they had been sort of, like, lagging in their numbers.

Um, they did studies of this ahead of time. People have been asking this question for a while. Like, for months now, people have been out there trying to figure out what works. Like, secretly doing studies on us to try to figure out how we would respond, and what would get us vaccinated. Um, they asked, like, "If we gave you money, would you get vaccinated?"

And what they found is, like, two thirds of those surveyed had a price.

Justin: [unintelligible]

Sydnee: There was a number.

Justin: I got a number.

Sydnee: And for a third of 'em, it was a hundred dollars or less. [laughs quietly]

Justin: Nice.

Sydnee: So for a third of people, a hundred bucks'll get you vaccinated.

Justin: Write the check! I mean... I don't—I don't—I think the coercion thing is silly. Who cares? Who cares if it's coercion?

Sydnee: Well, I—no, you always need to—where the—I think where the ethics—

Justin: Coercion, I think of it—okay, hold on. We—we use coercion in every facet of society. We coerce people by giving them tax incentives for behaviors that we approve of as a society. We have celebrities who are telling people to go out and—I mean, like, it's coercion. Like, it's—it's all coercion.

Sydnee: You have to think about things like—so the, um—the US Equal Employment Opportunity Commission had to issue guidance on this in terms of, like, employers.

Justin: Right.

Sydnee: What can they... to avoid them coercing their employees into receiving vaccines. Um, they've had to issue guidance because of this kind of thing. 'cause if you're an employer and you're like, "Hey, I'll give you a day off if you get the vaccine, and we're the ones giving you the vaccine," then it starts to—it gets icky.

Justin: Why?

Sydnee: It gets dangerous.

Justin: Why?

Sydnee: What they've said is that if it's a third party—if they're like, "If you just bring us proof that you got vaccinated," it's fine. But we don't want to set the precedent that the employer can start giving you medications, and they can fire you if you won't take them. I understand this vaccine is different. I understand that.

But, like... do you trust big business to have that power? Or do you want somebody independently saying, "Okay, look. These vaccines are great, yes. You should encourage your workers to get them. But, like, let's be careful how we do it. Let's just make sure we're doing it in an ethical way."

Justin: Yeah, I—no. I mean, that's a fair point.

Sydnee: I mean, really. [laughs]

Justin: It's a fair—I mean, it's not—yes, that's a fair point.

Sydnee: Because if they can save money by cutting out bathroom breaks and having their employees pee in bottles, you know, maybe, for example, just a wild example I came up with off the top of my head, they'll do that. So what else?

Justin: Yeah, no. It's—it's fair. There's always limits.

Sydnee: Um, but I—the point is, we have an established track record that in various programs throughout the world, they have given people cash. Cash is usually pretty effective. [laughs quietly] To get a vaccine. And they've gone and gotten a vaccine.

And a lot of those people were gonna get it anyway, right? I mean, we're not dealing with people who were absolutely against the vaccine, and then said, "Well, okay. But for a hundred dollars, I'll do it."

Justin: Right.

Sydnee: Those people have probably made up their minds. But there are a lot of people for whom getting the vaccine is a perceived burden, and if there is something given to them to offset the burden of getting the vaccine, they're more likely to get it.

Justin: There's—and I know that there are a portion of the population that is, like, vaccine hesitant in the literal sense. Where they're like, "I will go get it. Just, like, I need to—I'm procrasti—" vaccine procrastinators. Either it's, "I wanna see how it goes with everybody else—"

Sydnee: That's a big one.

Justin: Which, by the way, chill impulse! Very cool of you! "I wanna see how it goes with you guys, and then, you know, I'll maybe dip my toe in if you guys haven't grown a third nipple or something." Like, it's—[laughs] what a wack thing to do! But it's also like, "I don't know, I just haven't had the time to do it. I know I need to do it but, like, I just haven't had time."

Because there's—'cause we have people who are, like... barely getting by. So, like, yeah, it's not that ea—you know, look at the voting rate! You know? That's a hugely important thing that'd be great if everybody did. And we don't make it easy for anybody.

Sydnee: No. I would say that, um, as challenging as it may have been at some times during this process to get a vaccine, it is way easier right now [laughs] to get a COVID vaccine than it is to vote, for many, many Americans, if you can believe that, in our—what shining hill of democracy, whatever the heck we say we are.

Anyway. Um... the only other thing is, I thought it was really interesting, as I was reading about the history of these incentives and, like, the idea, is this helpful? Which, again, it seems it will be. Or at least it could be. It's a good effort.

Um, they have been trying to figure out how to get us to take this vaccine this whole time. Uh, one of the things they did a study on, they did surveys and found, was that there were a proportion, especially of people who identified as Republicans, who were more likely to get vaccinated if it meant that they didn't have to wear a mask anymore. Democrats said they were, too, but Republicans even more so.

Um, and you gotta wonder, when you saw, like, the CDC issue the guidance that if you're vaccinated you no longer have to wear a mask, you gotta wonder how much of that didn't come from this idea that we have all these people we really need to get vaccinated and they're just not, and maybe if we incentivize them this way they'll get vaccinated.

Justin: I mean, I would've argued a smarter way of doing that would've been, like, "If we can get to this number as a society then we can walk it back," so there's, like, peer pressure to get people. Rather than just, like—

Sydnee: [simultaneously] Well, I would—I would agree with that. I know.

Justin: "Let's all go honor system on it." 'Cause it's like, I'm sorry, you walk around now anymore and I don't know how it is across the country, but you walk around indoors in West Virginia anymore, there is zero mask adherence. Which, like... I know the vaccination rates here, and they ain't a hundred percent! [laughs] Like, absolutely not. So, like...

Sydnee: No, I know. No. I mean, I think it was a risky play. I'm not saying I necessarily endorse it. I think it was a very risky play. I think—and this is a whole other subject, so I'm not gonna get into it. I think especially children have been completely left out of the thought process for the rest of this pandemic.

Justin: My kid—my kids still have to wear masks, which we have told people from the beginning are to protect you from other people—er, to protect other people from you, sorry.

Sydnee: Yes.

Justin: Excuse me. So, like, they have to wear the mask, even though we've been told that, like, that's not what it's designed for. Yet all these other adults, unvaccinated adults, can just hang around no problem. Like, it sucks.

Sydnee: Yeah. It's—it's really—it's—[sighs] it's been very, um, upsetting to me. Not just as a parent, but, like, I'm a human, and kids are humans, and I care about them just like I care about other human adults. Um, to see how much they've been left out of the conversation as we move forward.

Because the thing is, like, I agree that kids benefit from being able to be around people and other kids, and I agree that we needed to move in a direction where we could get kids in school, and safely in places, and all that. But kids don't mind wearing the masks.

Anybody who's out there saying, like, these masks are harmful to kids, have you been around kids wearing masks? They don't care. They are better at it than

adults. They are. They just wear 'em, and they don't really think about it, 'cause they're getting to, you know, go places again. And so if they have to wear a mask, they'll do it. The masks weren't harming them. The masks weren't harming us. [laughs quietly]

Justin: Yeah.

Sydnee: But, um—but that's a whole other issue. Anyway, all of this being said, I would like to apologize on behalf of our—our country, that we are having this conversation about, how can we pay people to get vaccinated, when there are so many places in the world where people would pay to get vaccinated, or walk miles, or...

Justin: I know.

Sydnee: Whatever, to get a vaccine, and they just don't have them. We have, like—I think one statistic said we have, like, more vaccines than people right now. And we can't pay people to get vaccinated.

Justin: I know.

Sydnee: And I—

Justin: So sorry about that.

Sydnee: —I know. And I know. I know, like, from a moral standpoint, there's a part of—when I hear people cry for, like, "If these people in the US don't want 'em, send 'em somewhere else where they'll take 'em."

I mean, I understand that. I understand that feeling. Um... I do think, like, it's a systemic failure. It's not the fault of every individual whose vaccine hesitant, it's the fault of our institutions that have failed us educationally, on all levels.

Justin: [sighs] Um...

Sydnee: But anyway, sign up in West Virginia. And hey, if nothing else—I told mom, I said, "Mom, I don't know what I would do if I won a gun. I don't want a gun. I don't have guns and I wouldn't own guns, so what would I do with a gun?"

And she said, "Well, maybe you can, like, dispose of it somehow, and rid the planet of one more gun?" [laughs]

Justin: That's true. That's an option.

Sydnee: I don't know how one disposes [laughs] of a gun.

Justin: You just throw it in the woods.

Sydnee: I don't think that's it. I have to look that up.

Justin: [simultaneously] Just throw it as far as you can.

Sydnee: Like, [laughs] what do you do if you just wanna get a gun out of circulation?

Justin: [simultaneously] Throw it... throw it in the woods.

Sydnee: Where—[laughs] what do I do with it?

Justin: As far as you can. 10, 20 feet, in the woods. Deep.

Sydnee: But that's my plan. If I were to be the recipient.

Justin: Don't—don't email us about how to get rid of a gun. If it becomes an issue we'll let you know. [laughs] Thank you so much.

Sydnee: We won't be getting guns. Don't worry.

Justin: Thank you so much for listening to our program. We wanted to let you know—I have a quick plug. Um, I am the narrator for a horror anthology series called *Bad Vibes*. I play a character called Mr. Boogey. He's, like, kind of a scary gentlemen.

Sydnee: Ooh!

Justin: Yeah, and he's the host of the show, and he narrates it. And they got a lot of great writers, and a lot of great stories. It's made by a company called QCode, and I am the narrator of it. And it—it—a lot of people have said good stuff about it. It's cool. It's kind of in 3D audio, so if you listen with headphones, which

I would recommend, it kind of, like, sounds like, you know, stuff to the right's over here, you know, that kind of stuff.

Sydnee: Ooh, spooky.

Justin: It's cool. It's called *Bad Vibes*. Um, so please check it out if you get a chance.

Sydnee: And please get vaccinated. Please?

Justin: Well, Syd, we should've led with that! Now I look like a real heel.

Sydnee: [laughs]

Justin: Sheesh!

Sydnee: I'm just saying.

Justin: Sheesh, Syd!

Sydnee: Ask your friends and neighbors and family. Like, encourage people. Talk it up. Help people find—dispel myths. There is no cost. There is no microchip.

Justin: Spread the word. Safe, free, and effective. Um, thank you so much for listening. Thanks to The Taxpayers for the use of their song, "Medicines," as the intro and outro of our program, and thanks to you! That's gonna do it for this week, so until next time, my name is Justin McElroy.

Sydnee: I'm Sydnee McElroy.

Justin: And, as always, don't drill a hole in your head!

[theme music plays]