@Risk - Taxing Truths and Flying Falsehoods with Carl Bergstrom and Cass Sunstein

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Jodi: Hey, I'm Jodi Butts. Welcome to @Risk, brought to you by Interac.

Today, I speak with two authors, Cass Sunstein and Carl Bergstrom, both of whom have new books out that are useful as we try to think better about risk together. Because there are lots of salesmen trying to convince us of miracle cures for the things that could kill us, couching their misleading statements in superfluous mathematical and scientific jargon. And even accurate information can confound and overwhelm without intent.

Listen as Sunstein and Bergstrom provide us with the tools to better process and understand the data that feeds our risk decision making, and how too much bullshit and too much information, even if accurate, can create new risks when we don't think carefully enough about the impacts.

Today I'm joined by Cass Sunstein, best-selling author, Robert Walmsley University Professor at Harvard Law School and the administrator of the White House Office of Information and Regulatory Affairs in the Obama administration. His latest book, *Too Much Information: Understanding What You Don't Want to Know* is available now. Cass, thank you for joining me and welcome to @Risk.

Cass: A pleasure to be here.

Jodi: What's the perniciousness caused by too much government mandated information disclosure?

Cass: There are several perniciousnesses. One is you can just confuse and overwhelm people. So if you give people a ton of paper or a ton of words, it might just baffle them and it might not have the desired impact.

Another possibility is you might really scare people unnecessarily or make them feel depressed or hopeless if you give them some information, for example, about medicine that's really going to help you, and it's packed with stuff about side effects which demoralizes you.

And a third possibility is if you give people information, it might be that an activity that they're enjoying like going to the movies and eating popcorn is less fun. So to be very careful about whether an information mandate is going to impair or ruin an experience is a really good idea for policy makers.

Jodi: So bearing those problems in mind, what are we undervaluing when we don't consider the consequences of mandatory information disclosure?

Cass: I think the main thing we undervalue is the nature of the human mind. So some information disclosure requirements treat human beings as if we are computers or algorithms, where we hear stuff about, you know, safety risks, or hear things about COVID-19, or hear things about sustainable behavior. And we really aren't algorithms, and we don't have unlimited computing power. We also have emotions.

And so to understand that people need to be met where they are with information is a really good idea. If you tell people something, it might end up making them think that some activity that's really basically fine is going to kill them, or you may make them feel that some activity that is a part of their life is… Has red lights in front of it, when in fact all it has is yellow lights.

And if you trigger emotions, that can be a good thing if you want people to avoid a risk. Sometimes to get people to be kind of scared of starting to smoke cigarettes, that's a good idea because smoking kills a lot of people. But if you get people really scared about consuming something which isn't very dangerous but they should just be aware that over consumption, for example, is risky, then you can kind of ruin their days.

Jodi: When I think back to about 10 years ago in the policy making universe, there was so much promise around transparency. We felt like it was going to accomplish so much. Has it accomplished anything?

Cass: Yeah, a lot. So there are things involving environmental risks where governments have publicized who are the biggest polluters. And transparency has been extremely effective in some countries in encouraging polluters to emit less. With respect to greenhouse gas emissions, transparency is on balance a good thing. It can trigger public concern and it can trigger feelings of conscience.

When people get food that has calorie labels on it, there's transparency about that. The record is that can – the record we have so far, early days – is that this can be a big benefit for public health. If there's transparency that there's, for example, peanuts in food, or shrimp in food. Some people have allergies to peanuts. I don't, I confess. I do to shrimp. But having this kind of transparency can be a really good idea.

So part of the goal of understanding what information is too much information is also to get clear on the fact that in every society really, high levels of transparency with things can be a great safeguard both for health and safety and against government malfeasance or mistakes.

Jodi: We had this interesting experience in Ontario, Canada where about 15 years ago a piece of legislation was introduced to create mandatory disclosure of public sector salaries over a hundred thousand dollars. Flash forward to today, one of the

accomplishments, some say the only accomplishment of that statute, is that it's really driven up salaries in the public sector. And I don't think that was the intention behind it.

Cass: It's a great example. So I taught for a long time at a university where we weren't really allowed to say what our salaries were even with our best friends. There was a moral taboo on discussing your salary. And you could say that was a good idea as a way of discouraging, you know, kind of ugly bragging or ugly self-pity. But really what the university was thinking is the salaries are fine. And if people are talking with one another about their salaries, they're going to get really competitive and it's going to be a kind of arms race among faculty members for more and more money. And that's really not good for anybody.

Now whether or not that was the right call, we can completely understand the call where transparency as in the case you describe can make people think, "Hey, I'm earning less money than my colleague." And that could be a good thing, let's say, if they're being discriminated against or treated unfairly. But it could be not so good a thing if we get a kind of arms race among people who are basically doing fine.

And it sounds like the people you're describing, they're earning a pretty good amount of money. And the consequence of transparency can be to hurt people who have to pay the bill. And maybe the people who have to pay the bill are people who don't have a whole lot of money and shouldn't be subsidizing that form of competition.

Jodi: So how will we know if policy makers have taken up the challenge in your book?

Cass: The idea about information disclosure on the policy side can be tested by looking at what exactly is being mandated and what are the likely effects, either anticipated by people who have knowledge or are found by people who have actually been studying it.

So I'll give one example where the Trump administration and I think the Obama administration would not differ, which is graphic health warnings for cigarettes. And we're going to have those on the front of the pack, graphic warnings. I applaud that and the Trump administration has gone forward with that.

The best projections before the fact is that that's going to save a significant number of lives. We'll know whether that disclosure requirement is too much information or is actually helpful by studying as carefully as we can what's happening to smoking secession and starting smoking as the graphic warnings are rolled out. So in the next five years in real time we're going to have an opportunity to study that.

With respect to other disclosure policies, let's say disclosure of greenhouse gas emissions on automobiles, connected with automobiles. We have labels when people buy cars, that's disclosed. As well as the economic impact of a fuel economical vehicle. So you can see whether you're going to save a lot of money or a little over five

years, or you're going to lose a lot of money over five years because your car isn't very fuel efficient.

We can study the effects of that label. That came from the Obama administration. The Trump administration has maintained it. Is it the best label? That would be really surprising. Is it a good label? Probably, but that's a speculative word, testing in real time what's happening.

And with labels that involve use of sunscreen, labels that involve medicines that have side effects, we can learn just by testing whether they're helping people or not, reducing risks or not. And that's- that would be a fantastic project for the near term.

Jodi: So another aspect of these requirements to disclose is on the enforcement side or the timeliness side. And I'm just so tempted while I have you here to ask you about the global pandemic and this very challenging situation we're in.

Lots of folks point to the fact that China's reporting was so delayed around the outbreak of the novel infectious disease, and that has led to some catastrophic consequences. I'm wondering if you could just share some thoughts with us about timeliness and how you create good incentives for sharing of information?

Cass: Okay, so there are two great incentivizers for disclosure of information that really should be disclosed. One is democracy and the other is free markets. So in a democratic society, it's generally understood that sunlight is the best of disinfectants, as a judge once wrote. And it's also understood that if people keep things secret, there might be, when things are working well, hell to pay unless there's good reason to keep the thing secret, like national security or privacy. So a well-functioning democracy with freedom of press and civil society can work against, let's just say, unjustified secrecy. It's not perfect, but it's pretty good.

In free markets, if a company, let's say, is selling a product and being secret about the fact that it has some side effect or it has some hidden terms that you're going to get hit by only six months in. Or let's say the product kind of breaks down in a hurry and the company either doesn't disclose that or lies about that. If the competition- the system of competition is working well, that's going to get out pretty quick and that company's not going to do very well. So the fact that in free markets products that succeed tend to be revealed as better than products that fail is a tribute to the transparency forcing impact of free markets.

In societies that don't have free markets and certainly in societies that don't have a democracy or something close to it, let's call it self-interested or harmful secrecy is far more likely.

Jodi: You are also a Bloomberg opinion columnist. And in February of this year, when we were still very much gathering data to better understand the threat of COVID-19. you published an opinion piece on the dangers of probability and neglect, which is

when we ignore the likelihood of occurrence. We now have a lot more information about this virus, but the debate seems to keep going on in the United States about the severity of the illness and the appropriateness of the response.

This is a show about risk. And as a policy maker, what can be done? What might the guardrails be to keep the risk discussion grounded in math and science as much as possible and less so in emotion and experience?

Cass: Well, I worked on risk really for four years in the US government. I was lucky enough, or cursed enough, I think lucky, to be overseeing risk regulation among other things in the United States, subject of course to the president's direction. And the greatest safeguard I saw against, let's say, under-reaction and over-reaction to risk consisted of an insistence on putting the experts not only kind of in the building but in the room. So when decisions are made about, let's say, a potential pandemic, or about climate change, or about air pollution, or about highway safety, to have people who you don't even know what their politics is, all, you know, is that they're specialists in the area is essential.

The two offices in the white house apparatus that I, you know, most loved in my heart of hearts were the Office of Science and Technology Policy and the Council of Economic Advisors. I love them all, I hasten to add, but these were my two great loves.

And it's because the Office of Science And Technology people, they were data people and you couldn't predict what they'd say. So on a Tuesday they might say, “You know what, the government's- our government's all worried about this risk. It's really small, don't regulate it.” And then on Friday they'd say, “The government's all worried about this risk. They're right. In fact, they're underestimating the magnitude of the risk.” So their technical focus completely outran their policy commitments.

And the Council of Economic Advisors, which is a relatively apolitical set of economists in most administrations, they might say, “You know, this is going to impose extremely severe costs on the world in terms of illness.” And then on something else they might say, “No, it's not much of a problem. Don't worry about it. Because if you monetize the value of the harm, it's pretty small. And to put those people in the room in Canada and Germany and Denmark or China is indispensable.

Jodi: Wise counsel. Hopefully we can see some change around that soon around the world and in the United States. Speaking of President Obama, you had this great anecdote in the book when you're speaking to the President and it's around the onerous paperwork obligations and how that leads to sludge. And you were discussing the need or the potential to issue a supplement to the President's executive order. And you shared that President Obama in that moment told you that the American people don't really care that much about your darn data call.

And I laughed because a) it's funny, but b) Ben Rhodes in his book, *The World as it Is*, he also shared an anecdote involving President Obama where he told him nobody in Ohio cared about Burma. What do you think the president is reminding you about? Where are these comments coming from where he interjects, you know, the viewpoint of the American people?

Cass: Well, he was at that moment really focusing on large questions about risk, actually, and thinking about climate change. Tens of thousand people dying on the highway. Immigration, which can take… It creates risks of multiple kinds. And he was thinking, you know, there are some large questions here about policy. And his basic focus was on analysis of costs and benefits, analysis of equity, and analysis of who's helped and who's hurt. So those were his big concerns.

There's a data call which my office issues asking agencies to give data about paperwork burdens. And he really wanted to reduce paperwork burdens. He still does today, and he did a great deal to do it. But he was basically kind of laughing about the fact that we've got big problems here and your data call, he was basically saying you handle that. That's not priority number one for the president of the United States.

Jodi: Thank you, thank you for sharing that. And I know you were breaking your personal role of not talking about your conversations with the president, but that was a great one. So thank you for that.

I really enjoyed the book and one of the reasons I enjoyed the book so much was that I felt on a higher level it was a reminder that there is a practice that has been built up over hundreds of years around good governing that is supported by evidence and a dedication to the ethic of continuous improvement. What do you make of our situation today in the United States and looking at policy making today? Are the policy makers continuing to build up that practice despite the challenges that some leaders like the president are throwing their way?

Cass: That's a great question. So we have 50 states as well as a national government. Massachusetts, the state in which I live, is broadly speaking dedicated to good governance. And whether the issue involves air pollution, or COVID-19, or road safety, there are a lot of people working every day to try to make things better. And that's a project that's a work in progress in Massachusetts, in every state, but there are a lot of success stories in the last year, in the last five years. Take your pick of area there, you can find some where there are success stories.

At the national level, it's also very complicated because of the size and diversity of the national government. So we have people working in a part of the government that I like especially, which is the department of transportation, who are trying really hard to get those 35,000 plus annual highway deaths down and having some significant successes, at least in making things better than they would be were they not hard at work.

We have had under President Trump, I'd say, unusual challenges in getting a careful focus on technical issues, at least in some areas. So in the area of environmental protection, the politicization of policy making, let's call it, has not been compatible with the highest aspirations and the best history of our Environmental Protection Agency. So that's something that needs to be improved greatly.

And there are other domains where the interest in deregulation, which has some important virtues, the interest in deregulation has outrun the focus on, you know, maximizing good outcomes. So if you try to deregulate risk regulation, that's often a good idea but it's often not a good idea because it means that people will be at risk. And the numbers actually support that, where every year our government issues a kind of report on the benefits and costs of regulation.

And under President Trump, the net benefits, that is benefits minus costs, have been the lowest in recorded history. The costs have also been the lowest in record history. That's good, but the net benefits, and that's the best measure, have been the lowest. And that's really bad because that suggests that people are being subject to risks that we could eliminate. And I'm talking about mortality risk. The cleaner word is death. And we need to have more focus on reducing the number of people who die from risks, and that I hope will be a focus for the next 20, 50, or 5,000 years, a little more intensely focused on than has been in the last few years.

Jodi: Cass Sunstein, thank you so much for your dedication to good policy making and for joining me today. I really appreciate it.

Cass: Thank you, a great pleasure.

Jodi: Carl Bergstrom is a professor of evolutionary biology at the University of Washington in Seattle. More than a decade ago he conducted research on the role of government in pandemic planning and has been a critic of the current response. He is the co-author with his colleague, Jevin D. West, of a new book, *Calling Bullshit: The Art of Skepticism in a Data-Driven World*. Thank you for joining me Carl and welcome to @Risk.

Carl: Thanks, it's great to be here.

Jodi: So straight off the top, is bullshit winning?

Carl: Bullshit has a big advantage, and the big advantage is known as Brandolini's law or Brandolini's bullshit asymmetry principle. And the idea is that bullshit takes an order of magnitude more work to clean up than it does to produce. And so as a result people can create enormous amounts of this stuff and it takes tons of effort for us to come around and clean up all the misinformation out there. So that's the edge that it has.

And we are right now in a in sort of a position in society where we're struggling to keep up and adapt to some of the new changes, such as social media, that have really sort of improved the ability of bullshit to spread across our information environments.

Jodi: Do you think bullshit is a bigger problem today because of some of these things, whether it's algorithms or just the scale that technology provides today?

Carl: I think absolutely. You know, people have always complained that, you know, for thousands of years people have complained that, you know, bullshit has gotten worse than it used to be. Of course we didn't use that word. But just the sort of the, you know, decay of truth and the decay of the media environment and so on.

So it's not a particularly new claim that we're making, but I do honestly believe that it's true that right now we're dealing with this stuff more. It's posing, you know, having a bigger impact on our lives, posing a bigger threat to, you know, everything from democratic governance to our ability to take care of planetary health to things like our ability to manage a pandemic than we have seen in the fairly recent past. So I do think that we're facing, you know, more of a bullshit challenge than we have been in the past.

I think a big part of that is coming from the way that media has changed over the last 20 years. And some of that is certainly to do with social media. And it's the fact that social media platforms are designed to keep you online and to maximize your engagement with a platform, not to maximize the informativeness or accuracy of the information that flows across there.

And so the whole user experience involves putting information out there and then it's shared virally in ways that can take a, you know, a single poorly sourced claim and then that can sort of explode across the internet. And, you know, a day later you could have, say, the President of the United States retweeting something that somebody made up a day previously.

So that whole structure definitely has changed the kind of information that we're receiving. And then the other side of that is, as you mentioned, these algorithms are likewise designed to maximize our engagement rather than being designed to maximize accuracy. And so we've got this whole level of, you know, sort of machine learning that's being layered on top of all this to figure out what is it that this person is most likely to click, most likely to reshare, most likely to watch? And what, you know, tends to be the case is that sort of more extreme content, more shocking content, more, you know, enraging content, whatever it is, these are the things that get shared. And so they have actually got these platforms that are trying to feed us this information to keep us engaged even though it's not necessarily the most accurate information on there.

Jodi: Yeah, absolutely. And you also talk about in the book right off the top actually that that there's sort of old school bullshit and there's new school bullshit. What's the difference?

Carl: Yeah, absolutely. So when we think about old school bullshit in the book, we're talking about the sorts of weasel words that a corporate spokesperson might use to diffuse responsibility or, you know, a politician's empty promises. Or maybe the essay that you wrote at midnight the day before your high school paper was due and you hadn't actually read the book. So just, you know, kind of misinformation or just sort of a disregard for the truth laid out there in in common words.

When we talk about new school bullshit, we're talking about the way more and more this is coming packaged in the form of statistics, in the form of mathematical analyses, in the form of machine learning models. Just numbers, figures. And so much of the information that we consume in the media today, it takes on this quantitative form because the world has become so thoroughly quantified. And people make decisions based on numerical information and the, you know, popular media communicate to us using data graphics and other forms of numerical information.

And the thing is that we don't necessarily have the same uh, you know, bullshit detectors for numerical information. We feel like numbers are objective, they're precise. They feel like they're scientific and they come straight from nature instead of being, you know, instead of being sort of, you know, subjective and personal the way that the words are. So that gives them this sort of veneer of authority that perhaps they don't deserve.

And then, you know, in addition to that, so much of this quantitative information comes filtered through different kinds of statistical analyses or whatever. And so if I'm reading about somebody's, you know, multivariate logistic regression and I don't remember what a multivariate logistic regression is or I never had a stats class or whatever, I may feel really, you know, reluctant to question or challenge that assertion.

And so by wrapping things up in numbers, it's a way for a bullshitter to avoid being called on it, avoid being challenged in order to, you know, basically, you know, have this impact on the audience.

If I could just quickly, I think it might be useful for this conversation if I could just quickly define what I mean by bullshit as well in our book.

Jodi: Yeah.

Carl: So we're talking about language and statistical figures, data graphics, other forms of presentation. And the key thing is that they're designed to persuade by impressing and overwhelming a reader or listener. And that's done with a blatant disregard for truth and logical coherence. And so, you know, that's what we're thinking about there is where, you know, you're kind of throwing… Whether it's rhetoric or numbers or

whatever at somebody to persuade them, to make them feel like they can't challenge it, to overwhelm them, and you don't really care about informing them factually.

Jodi: You talk about bullshit also in the context of democracies. Both you and West comment that democracy is healthiest when voters can see through the coming from all sides. And, you know, I really paused on that because I'm like, well in some ways, you know, bullshit has always been a part of the political system. But, you know, is it a matter of quantity or is it a matter of quality, do you think, that makes this particular period just feel maybe a bit more dangerous?

Carl: That's a great question. Things are different. There is a particular disregard for truth that we're seeing right now that is not something with serious precedent in American history to the best of my knowledge. We have, you know, a world of alternative facts and this is, you know, considered almost a reasonable thing to say and talk about. You know, we have a case where presidents and other politicians are caught lying dozens of times a day, fact checkers lay this all out, and very few people care. Most people either already expect it to happen and so aren't surprised or say well, you know, "Yeah sure, he's not telling the truth about those facts. But he's on our side!"

You know, and I think that is really an erosion of democratic discourse and democratic decision-making if you get to the point where you have the sorts of tribal epistemologies that we do right now where the truth isn't determined by what the observable facts are, but rather by the identity of the person saying it.

Jodi: Yeah and I mean even… So there's sort of like, you know, like this big stage concern. And I certainly, you know, share a lot of the views that that that you just said. It does feel different than it has in the past. But I think in addition to that, like we need more, but in addition to that does bullshit make us vulnerable in other areas of life too? So that's sort of the political and our civic side, but are there other aspects to bullshit that make us vulnerable?

Carl: Well I think, you know, bullshit has made us vulnerable to, you know, advertising pitches and the likes for a long time. So we're certainly vulnerable in terms of, say, our consumer behavior. So definitely in that regard.

You know, in terms of… I think as, you know, various forms of bullshit, I think, have made us extremely vulnerable during this current pandemic crisis. So, you know, there's been this tendency throughout the duration of the crisis for the White House to treat this as a public relations problem rather than a public health problem. And so there's a focus on the numbers and making the numbers look good instead of a focus on solving the problem.

And what that does, you know, not only does it misinform us about what's going on, so, you know, a lot of us might, you know, say, listened on February 26 to the

assurances that, you know, this was, you know, there were just a few cases in the US and that was going down. And this was going to go away, and so we might have made plans for April that we weren't able to keep.

But also this sort of focus on manipulating the numbers really has really undermined the public health response in the United States. And the most dramatic example there I think is with testing. So testing is an extremely important component of a public health response because you can use it to screen for people who are infected but don't know it. And you can, you know, help those people then isolate from the population and reduce that spread. And there are many other important roles for testing as well, but, you know, that's one.

We have an administration that has been very reluctant to see testing ramped up in the United States because they view testing as a sort of, you know, the results from tests is sort of a report card on their performance. And so if there are a lot of positive cases, a growing number of positive cases, that sort of is seen as an indictment of their response.

So they've slow-walkeded testing throughout, the President has repeatedly tweeted, you know, that he would like to see less testing. That, you know, we wouldn't have so many cases if we didn't have so much testing. He'd like to see it slow down.

And this is a classic example of something we talk about in the book, which is Goodhart's Law. And so Goodhart's Law says, rephrased by Marilyn Strathern, Goodhart's Law says that when a measure becomes a target, it loses its efficacy as a measure. So once you start trying to make, you know, the number of cases… Once the number of cases is sort of seen as a report card, then you're going to have changes in the way the testing takes place that reduces the utility of that number of cases for measuring how well we're doing in terms of the response.

And then there's the second thing that comes with this, and this is sort of the there's something called Campbell's Law, which is another rephrasing of this, is that it also tends to create incentives for, you know, sort of perverse incentives for behaviors that actually make things worse. So not only does… Not only do you get the wrong information but, you know, the fact that you're using number of cases as a measure, it's incentivizing a slowing down of testing and an undermining of public health efforts around the country. So I mean I think yeah, these are the kinds of vulnerabilities that that come into play.

Jodi: Yeah, and numbers just require so much context, right? So I think about my own experience working in a hospital and I remember when we first, and I'm going to date myself here, but when we first introduced a system that allowed you to electronically report an incident or even a critical incident. And we spent a long time with our board really setting the context to say, "So we know this is counter-intuitive but when we implement this system, we actually want to see the numbers go up. We want to see the

numbers go up because it means we've implemented a system that's made it easier for people to share unanticipated outcomes, and that puts us in the best position to prevent their recurrence." But, you know, that takes time, right, and it takes a lot of trust.

Carl: That's a fantastic example too of, you know, anticipating a Goodhart's Law, Campbell's Law kind of situation and trying to hand that off pre-emptively.

Jodi: Having said that, you know, I think the President is, you know, on a different level. And I'm pretty sure Dr. Fauci has tried to have the conversation.

But science itself through this pandemic hasn't, you know, fared the best either. You know, pharmaceuticals, you know, making… Pharmaceutical companies making announcements by press release. The pulling of the hydroxychloroquine article. And then we've also seen, or at least I did, I was reading an article and it was some scientists complaining about the shutting down of all the hydroxychloroquine studies. Because even though it wasn't going to be this panacea for everyone who, you know, is positive and gets quite ill from COVID-19, there still might have been actually, you know, a possible, you know, positive treatment scenario. But because, I guess, the pendulum swung so hard both ways, you know, it hurts science.

So what does science need to do to, in your estimation, to maybe try and, well, just seem less bullshitty? Because it's really important that people have confidence in it.

Carl: Right. No, I think that this is a huge problem. It's something that we're, you know, worried about to a great degree right now during the current crisis because people are paying more attention to science than ever. And yet the way it's being presented and interpreted is, you know, seems perhaps less credible than than ever.

Your hydroxychloroquine one is the really interesting example because there you had a study that turned out to be fraudulent that was published in a top medical journal saying that hydroxychloroquine had these negative outcomes for patients, and on the grounds of that study a number of the other trials were halted. And that was a real tragedy that that happened, and it was a sort of failure of the system there that to let that paper go through and then to not look into that more carefully before those trials were shut down.

Now, you know, just realistically the many other hydroxychloroquine studies that are out there have not shown any serious benefits so, you know, it may not have been, you know, it may not have shut down the trials of some cure that we could have had but don't, but it definitely undermines science and the our ability to, you know, have solid data-driven rationales for the decisions we're making. And that was a shame.

So more generally I think, you know, as we've gone through the COVID crisis, one of the things that scientists have been trying very, very hard to do is to work as quickly as possible. And we've seen this sort of, you know, radical level of transparency in the

way that science is being done. So people are posting their results very early, people are posting raw data, people are posting pre-prints without going through the peer review process. Much of the conversation that in the past would have been taken taking place at scientific meetings or on the telephone or whatever is now taking place in open forums, whether it's on Twitter or on, you know, review sites like Pubpeer.

So there's been a whole, you know, there's been a sort of a, you know, science has really been sort of exposing the inside details in a way that haven't happened before. And because this matters so much to everybody, the media have very closely followed this and have reported on this. Which is, you know, ultimately a good thing, but it's often very hard to provide this word you talked about earlier, context.

And so to say “Look, you know, here is a new paper. This paper has just been posted to a pre-brand archive. It hasn't been peer reviewed. It offers an alternative, you know, it's making this claim. It doesn't mean that this claim is true, this is what, you know, leading scientists that work in the area that aren't affiliated with the paper think.” I mean this is sort of the way that these things should be presented.

But instead what we get is, you know, in order to sell newspapers each paper is, or ads these days, clicks, you know, each scientific paper is reported as if it's like this new major finding that, you know, stands on its own. As opposed to just sort of, you know, a colleague of mine, Natalie Dean, has this nice expression that, you know, each new paper is not a definitive answer to something, it's a pebble on the scale one way or the other. You know, so you've got two hypotheses.

And we don't have things being reported that way. And then as you have… Because the pandemic has been so overwhelmingly politicized, we have also a situation where people are cherry-picking very heavily from the results. So with any particular question, does hydroxychloroquine work, are we near herd immunity, whatever it is, you're going to have a range of studies done in a range of places with a range of methods that are going to get a range of results.

And because everything's been politicized you have this, you know, partisan or hyper partisan media that are just picking and choosing from those studies and presenting only the ones that support the end of the spectrum that they're trying to represent. And that has created a sense of, you know, distrust throughout and created… You also have this sense of whiplash because you're sort of only getting these extreme studies reported and, you know, hydroxychloroquine works today, doesn't work tomorrow. And what are you supposed to believe, and science is a whole mess. And I think it is the perception you get, you know, from the outside.

So I think it's something where we as scientists have to do a much better job of communicating what it is that we're doing and what it is that these findings mean. And I'd like to see more of the media following the lead of the very top reporters in this area.

People like Helen Branswell and Kai Kupferschmidt who do understand all of these subtleties and are very careful to present them in the work that they do.

Jodi: Yeah, I agree with that. There are so many new people reporting on this story too, right, which, you know, exacerbates the problems. Look…

Carl: It's hard.

Jodi: It's hard, and it's really hard.

Carl: And it's so much to learn so fast, right?

Jodi: Yeah, absolutely, absolutely. So you suggest that education is probably our best weapon against bullshit. And this book in fact is based on a course you teach at the University of Washington. I find that interesting, you know, I'm a lawyer by training. And, you know, we used to look to the law right to, you know, manage our problem. Why do you think education is the better solution today?

Carl: Well I think that, you know, when I try to think about how are we going to deal with the bullshit problem in general, and you can think about social media in particular or more broadly. I sort of see various pillars on which you could ground something like this. And, you know, so you could imagine tech solutions. You can imagine using artificial intelligence to detect fake news and block it or something. I'm very pessimistic about this, because I think that those problems turn out to be very, very hard. I don't really trust the incentives of the platforms to do this well. And there's potential to use sort of adversarial techniques, you know, if you can make an artificial intelligence that can detect fake news, you can make an artificial intelligence that can make fake news that the detector doesn't detect. So I don't think that's where things are going to go.

Then there's regulation and legal solutions, and I think there we really crash up against, at least for me, a strong sense of, you know, first amendment protections and freedom of speech. And so I definitely don't want, you know, criminalization or, you know, even, you know, strong civil penalties associated with speech in general. Because who gets to choose what's fake news and what's not? I mean we've got, you know, we've heard a lot lately of people calling anything they don't like fake news. And so that's a big concern for me.

You know, I think there are places where regulation can help, we could come back to that. But ultimately, you know, I think it has to be in the consumer of this information that the kind of filter resides. And I don't mean that as a way of like pushing responsibility onto individuals and say, "Hey, it's your responsibility to do all this." But I do mean that I think it's possible to empower individuals to be able to see through misinformation. And that's really a major theme of the book, is that look, you don't need a degree in statistics or in data science or anything like that to be able to spot quantitative misinformation, to be able to interrogate quantitative data.

All you need to do is just to be able to think logically in the same way that you've learned to already in life, and just realize that you can apply that to numbers as well. So my sense is if we can teach people more about doing, that we can really make a lot of headway there. The, you know, right now I think we don't do an adequate job in our in our STEM classes in teaching people to question the starting assumptions and why are they doing the analyses that they're doing.

We do quite a good job I think of teaching them to do the mechanics, and so our students tend to be quite good at being able to invert matrices and write code and do bioinformatic analyses and things like that. But because of the way we teach, we don't often show them, you know, good examples where the entire premises of a study or a question are fallacious. And you need to question those and step back.

And so I think as we move toward doing more and more of that, we can do a better job of teaching people to think in this way.

Jodi: Well, I highly recommend everyone read your book. It has certainly given me some tools as I move through, you know, the consumption of mass media. And I do think it's a big part of better managing your risks when you go out in the world, being able to spot bullshit and understand numbers in the process. Sometimes you have to thoroughly understand what something isn't to understand what it is. So thank you very much for your book.

Carl: I'm very very glad to hear that you liked it. Thank you

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